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• BHU (NO) 2019 • DSSSB (NO) 2019 • GMCH (NO) 2019 • RRB (NO) 2019 • Safdarjung (NO) 2019 • ESIC (NO) 2019 • AIIMS Raipur (NO) 2019
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- **Read & Practice:** Assess Yourself with 4000+ Qs covering all Subjects & Grand Tests focusing on AIIMS NORCET 2022-23
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- **Any Doubt Ask AMLI:** Get your TH queries resolved by **AMLI**, your THEducator
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- 3000 Golden Points for Last Minute Revision in Book & Podcast Form
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NORCET (AIIMS)

PGIMER

JIPMER

ESIC

RRB

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CHO/MLHP

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Muthuvenkatachalam S • Ambili M Venugopal



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Read & Practice

Assess Yourself with 4000+ Qs covering all Subjects & Grand Tests focusing on AIIMS NORCET 2022-23

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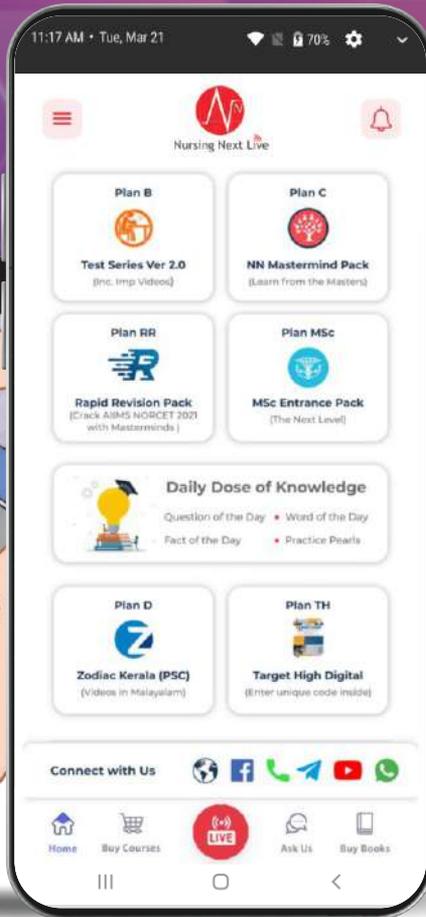
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Assess Yourself > Read & Practice

- 37 Subject-wise tests covering 4000+ Qs in Practice & Review Mode
- 5 Grand tests covering 1000 MCQs - 1 Grand Test of 200 MCQs every alternate month



High Yield Topics > Revise on the Go

250+ High Yield Topics (Tables & Images)



ADD ONs > Dil Mange More Content

- 100+ Previous Year Papers (Covering 12000+ Qs)
- 73 Appendices covering Imp. Topics
- Study Planner on How to Prepare for NORCET 2022
- How to Crack Nursing Competitive Exam through Target High
- Recent Update/Current Affairs every alternate month

All the content is not pre-loaded. It will get uploaded every month as per the schedule given in next 3 pages.

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- **Golden Points:** 15th of every month
- **Assess Yourself:** 20th of every month
- **Previous Year Papers:** 25th of every month
- **Grand Test/Recent Updates:** 30th of every month



1st Hybrid Update

Pre-Loaded Content

High Yield Topics

- 250+ High Yield Topics - Tables & Images of 10 Subjects

Add Ons:

- 73 Appendices covering Imp. Topics
- Study Planner on How to Prepare for NORCET 2022
- How to Crack Nursing Competitive Exam through Target High

10 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. AIIMS NORCET 2020 (With Rationale)
2. CNCI (Nursing Officer) 2021
3. AIIMS Nagpur (Nursing Officer) 2020
4. CHO Rajasthan 2020
5. Rohtak (Nursing Officer) 2020
6. RRB (Nursing Officer) 2019; Shift 2
7. DSSSB Shift I (Nursing Officer) 2019
8. Safdarjung (Nursing Officer) 2019
9. GMCH (Nursing Officer) 2019
10. AIIMS Bhopal (Senior Nursing Officer) 2018



2nd Hybrid Update

Golden Points - 5 Subjects, Infographic Video by AMLI

- Fundamentals of Nursing
- Medical Surgical Nursing
- Community Health Nursing
- Psychiatric Nursing
- Obstetric and Gynecological Nursing

Assess Yourself:

6 Subject wise Tests in Practice & Review Mode & 1 TH Grand test

- Fundamentals of Nursing: Set-1, Set-2, Set-3 (100 Qs Each)
- Medical Surgical Nursing: Set-1, Set-2, Set-3 (100 Qs Each)

Target High Grand Test 1 (200 Qs with their Rationale focusing on AIIMS NORCET 2022-23)



3rd Hybrid Update

Golden Points - 5 Subjects, Infographic Video by AMLI:

- Pediatric Nursing

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- Nursing Education
- Nursing Research and Statistics
- Nursing Administration and Management
- Microbiology

Assess Yourself:

5 Subject-wise Tests in Practice & Review Mode

- Fundamentals of Nursing: Set 1 (IBQs)
- Medical Surgical Nursing: Set 4, Set 5 (100 Qs Each)
- Obstetrical and Gynecological Nursing: Set-1, Set-2 (100 Qs Each)

Add Ons:

- TH Monthly Recent Update or Current Affairs (Update 1)

10 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. CHO Haryana 2021 (With Rationale)
2. AIIMS Patna (Nursing Officer) 2020
3. Jr. Grade Nurse/Jr. Staff Nurse/Jr. Nurse 2020
4. AIIMS Raipur (Lecturer) 2021
5. BFUHS 2021
6. DSSSB Shift II (Nursing Officer) 2019
7. Northern Coal Field Limited, Singrauli (Nursing Officer) 2019
8. RRB (Nursing Officer) 2019; Shift 3
9. NIMHANS (Nursing Officer) 2019
10. AIIMS Bhopal (Nursing Officer) 2018; Shift 1



4th Hybrid Update

Golden Points - 3 Subjects, Infographic Video by AMLI:

- Introduction to Computer and Nursing Informatics
- General English
- General Knowledge

Assess Yourself (Read & Practice):

5 Subject wise Tests in Practice & Review Mode & 1 TH Grand test

- Medical Surgical Nursing: Set-1 (IBQs)
- Obstetrical and Gynecological Nursing: Set-1 (IBQs)
- Obstetrical and Gynecological Nursing: Set-3 (100 Qs)
- Pediatric Nursing: Set-1, Set-2 (100 Qs each)

Target High Grand Test 2 (200 Qs with Rationale focusing on AIIMS NORCET 2022-23)

Add Ons (Dil Mange More Content):

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. Kerala PSC 2021 (With Rationale)
2. CHO Madhya Pradesh 2020
3. AIIMS Raipur (Nursing Officer) 2019

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- Assess Yourself: 20th of every month
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- Grand Test/Recent Updates: 30th of every month



4. RRB (Nursing Officer) 2019; Shift 4
5. AIIMS Bhopal (Nursing Officer) 2018; Shift 2
6. Daman and Diu (Nursing Officer) 2018
7. ESIC (Nursing Officer) 2016; Shift 2
8. Kerala PSC (Nursing Officer) 2016
9. Kerala PSC (Nursing Officer) Grade II: 2011



5th Hybrid Update

Golden Points – 2 Subjects, Infographic Video by AMLI:

- Introduction to General Intelligence and Reasoning Ability
- Arithmetical and Numerical Ability

Assess Yourself:

- 6 Subject wise Tests in Practice & Review Mode
- Pediatric Nursing: Set-1 IBQs
 - Pediatric Nursing: Set 3 (100 Qs)
 - Psychiatric Nursing: Set-1, Set-2 (100 Qs each)
 - Community Health Nursing: Set-1, Set-2 (100 Qs each)

Add Ons:

TH Monthly Recent Update or Current Affairs (Update 2)

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. JIPMER (Nursing Officer) 2020 (With Rationale)
2. AIIMS Bathinda (Nursing Officer) 2019
3. CHO Madhya Pradesh 2019; Shift-1
4. RRB (Nursing Officer) 2019; Shift 5
5. AIIMS Mangalagiri (Nursing Officer) Grade-II; 2018; Shift 2
6. ESIC (Nursing Officer) Bangalore 2016; Shift 1
7. ESIC (Nursing Officer) 2016; Shift 1
8. Kerala PSC (Nursing Officer) 2011; Set C
9. Kerala PSC (Nursing Officer) 2014



6th Hybrid Update

Assess Yourself:

- Community Health Nursing: Set-1 (IBQs)
- Psychiatric Nursing: Set-1 (IBQs)
- Community Health Nursing: Set 3 (100 Qs)
- Psychiatric Nursing: Set- 3 (100 Qs)
- Pharmacology: Set - 1, Set - 2 (100 Qs each)

Target High Grand Test 3 (200 Qs with their Rationale focusing on AIIMS NORCET 2022-23)

Add Ons:

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. Gujarat Staff (Nursing Officer) 2021 (With Rationale)
2. SKIMS (Nursing Officer) 2020
3. AIIMS Raipur (Nursing Officer) 2019; Shift 2
4. BHU (Nursing Officer) 2018
5. CHO Uttar Pradesh 2018
6. AIIMS Bhubaneswar (Nursing Officer) 2018
7. RAK New Delhi Entrance Exam 2017
8. ESIC (Nursing Officer) Bangalore: 2016; Shift 2
9. Kerala PSC (Nursing Officer) 2010



7th Hybrid Update

Assess Yourself:

- 6 Subject wise Tests in Practice & Review Mode
- Pharmacology: Set-1 (IBQs)
 - Microbiology: Set-1 (IBQs)
 - Nursing Research and Statistics: Set-1 (IBQs)
 - Microbiology: Set-1 (50 Qs)
 - Biochemistry & Nutrition: Set-1 (50 Qs)
 - Nursing Research and Statistics: Set-1 (100 Qs)

Add Ons:

TH Monthly Recent Update or Current Affairs (Update 3)

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern:

1. RRB (Nursing Officer) 2019; Shift 1 (With Rationale)
2. AIIMS Raipur (Nursing Officer) 2019; Shift 3
3. Safdarjung (Nursing Officer) 2018
4. AIIMS Raipur (Nursing Officer) 2017; Shift 1
5. ESIC (Nursing Officer) Delhi 2016
6. BHU (Nursing Officer) 2016
7. HP (Nursing Officer) 2016
8. RUHS MSc Nursing Entrance Exam 2016
9. RRB Paramedical PHN 2015



8th Hybrid Update

Assess Yourself:

4 Subject wise Tests in Practice & Review Mode & 1 TH Grand test

- Nursing Education: Set - 1 (50 Qs)
- Nursing Administration and Management: Set - 1 (50 Qs)
- Introduction to Computer and Nursing Informatics: Set - 1 (50 Qs)

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Target High Grand Test 4 (200 Qs with their Rationale focusing on AIIMS NORCET 2022-23)

Add Ons:

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. BHU (Nursing Officer) 2019 (With Rationale)
2. AIIMS Bhubaneswar (Senior Nursing Officer) 2019
3. RUHS MSc Nursing Entrance Exam 2018
4. AIIMS Raipur (Nursing Officer) 2017; Shift 2
5. ESIC (Nursing Officer) Bangalore 2013
6. UK State MSc (Nursing Officer) 2016
7. AIIMS Bhopal (Senior Nursing Officer) 2016
8. HPSSC (Nursing Officer) 2016
9. SCTIMST (Nursing Officer) 2015



9th Hybrid Update

Add Ons:

TH Monthly Recent Update or Current Affairs (Update 4)

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. ESIC Paramedical 2019; Shift 1 (With Rationale)
2. AIIMS New Delhi (Nursing Officer) 2019
3. AIIMS Raipur (Nursing Officer) 2017; Shift 3
4. RUHS Post Basic of Nursing Entrance Exam 2016
5. BHU (Nursing Officer) 2015
6. UK Nursing Tutor (Paper 1- Set B)
7. TNPSC Maternal and Child Health Officer 2015
8. RRB (Nursing Officer) 2015; Set A
9. ESIC (Nursing Officer) Chennai 2012
10. LNJP Hospital Delhi (Nursing Officer) 2012



10th Hybrid Update

Assess Yourself:

Target High Grand Test 5 (200 Qs with their Rationale focusing on AIIMS NORCET 2022-23)

Add Ons:

9 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. RAK MSc Entrance Exam 2018 (With Rationale)

2. AIIMS New Delhi (Nursing Officer) 2018
3. AIIMS Raipur (Nursing Tutor) 2017
4. AIIMS Bhopal (Senior Nursing Officer) 2016
5. DSSSB ANM 2015
6. RRB (Nursing Officer) 2015; Set B
7. Jhalawar Hospital and Medical College Society 2012
8. ESIC (Nursing Officer) Grade II: 2011
9. Insurance Medical Services (Nursing Officer) 2004



11th Hybrid Update

Add Ons:

TH Monthly Recent Update or Current Affairs (Update 5)

10 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. PGIMER Chandigarh (Nursing Officer) 2016 (With Rationale)
2. AIIMS Nagpur (Nursing Officer) 2018
3. AIIMS Jodhpur & Rishikesh (Nursing Officer) 2017
4. AIIMS New Delhi (Nursing Officer) 2016
5. RRB Secunderabad (Senior Nursing Officer) 2015
6. RRB (Nursing Officer) 2015; Set C
7. DSSSB PHN 2015
8. RRC (Nursing Officer) 2012
9. ESIC (Nursing Officer) Ahmedabad 2011
10. RML Hospital (Nursing Officer) 2011



12th Hybrid Update

Add Ons:

TH Monthly Recent Update or Current Affairs (Update 6)

Special Bonus Target High Grand Test 6 (200 Qs with their Rationale focusing on AIIMS NORCET 2022-23)

10 Previous Year Papers of Imp. Exams with National Level Ranking & Real-time Exam Pattern

1. AIIMS NORCET 2021 – Recall with Rationale
2. AIIMS Jodhpur (Nursing Officer) 2020 (With Rationale)
3. AIIMS Jodhpur (Senior Nursing Officer) Grade 1: 2018
4. AIIMS Raipur (Senior Nursing Officer) 2017
5. AIIMS Bhopal (Nursing Officer) 2016
6. GMCH (Nursing Officer) 2016
7. JIPMER (Nursing Officer) 2013
8. JIPMER (Nursing Officer) 2012
9. RRB (Nursing Officer) 2012
10. ESIC (Nursing Officer) Ahmedabad 2011



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Foreword

**Sandhya Gupta
Reddemma K
Indarjit Walia**

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Foreword to 6th Edition

I know Dr. Muthuvenkatachalam when he joined as student for postgraduate studies at AIIMS, New Delhi followed by PhD which also he did under my guidance from PhD consortium of Indian Nursing Council and Rajiv Gandhi University of Health Sciences. And thereafter, we have done some research projects together. I would like to emphasize here that he is a highly motivated to improve the standard of nursing education. His dedication is visible from the way he has been putting efforts to update this 6th edition of book *Target High* which is already on runaway success and enjoys greater acceptance and appreciation by all readers.

In my opinion, the book has the original contents, which are well thought out, keeping in mind ever changing health science, treatment protocols and health care delivery system. The work in this book requires praise for the author in doing evidence-based updating of content of *Target High 6th Edition* from each reader who will get oneself ready for all competitive exams in Nursing Science.

The *Target High 6th Edition* is prepared with interactive approach and the content is supported with several examples and illustrations for better understanding of complex content. This book is one single platform for students who are looking forward to crack any of the entrance exams, particularly for the nursing officer's and staff nurse positions in the country.

I congratulate Dr Muthuvenkatachalam S for bringing out *Target High 6th Edition at the right time when the competition is all time high*. Dear readers, this book is well referenced from standard books and will work as guide for you for all areas in nursing science and will motivate you to excel in your professional practice in addition to success in entrance exams.

Dr Sandhya Gupta

Formerly-Principal (Actg.) & Associate Professor
College of Nursing, AIIMS, New Delhi

15.9.2021

Foreword to 4th & 5th Edition

In this fast-paced world, the healthcare industry has become an area of utmost importance. People have become more aware about their bodily needs and they are ready to spare their valuable time for keeping themselves hale and hearty. In such circumstances, the personnel working in the field of nursing have to perform a crucial role. To perform their roles with dexterity and sheer determination, the nursing professionals have to keep themselves updated with the modern techniques of healthcare and for this, they have to explore the nursing examination system.

It is my privilege to write the foreword of a book which is a gem of a book available for the staff nurses and nursing officers' exam. There is no dearth of books for the nursing recruitment examination but it is a fact that the aspirants need something which could prove a panacea for such examinations, and the book, *Target High for Nursing Officer/Staff Nurse Recruitment Exam* is one such effort of the authors. Dr Muthuvenkatachalam Srinivasan and Mrs Ambili M Venugopal have produced a wonderful book which will undoubtedly help the aspirants in hitting the bull's eye. The authors are masters of their fields and so they have included everything which is needed by the aspirants of this exam.

In addition to this, renowned reviewers have reviewed the important topics of this book and these topics enhance the accuracy and authenticity of this book. After going through I can say with authority that this book has certainly an edge over the other books available for *Nursing Officer/Staff Nurse Recruitment Exam*.

I wish the authors all the luck and success, and really appreciate their commendable efforts which is a boon in true sense for the nursing officers/staff nurses' aspirants.



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Foreword to 1st Edition



In this era of increasing competition in the healthcare industry, it is becoming impertinent for the nursing professionals to keep themselves prepared and demonstrate their competence. Being a Staff Nurse in a reputed institute is a dream of millions of nursing professionals and they need to be well-equipped with knowledge and in-depth understanding of Staff Nurse Examination system, the syllabus and key elements that are critical to achieve success. While there are many books available in the market for preparation of the major Staff Nurses Recruitment Exams, they do not provide a comprehensive coverage of knowledge and guidelines to crack these examinations.

It is my pleasure to write the foreword for **Target High** written for Staff Nurse Recruitment Exam by **Dr Muthuvenkatachalam Srinivasan** and **Mrs Ambili M Venugopal**, which I believe with its integrated and cyclopedic approach, will fill the lacuna in the staff nurses' exam preparation. **Dr Muthuvenkatachalam** has put in great efforts and hard work to write this compendium and make it a worthy addition for the aspiring nursing professionals by best

meeting their needs and expectations. His own genius and experiences are worth appreciation and I am sure they are his motivation in the creation of this book.

The subject-wise synopses and MCQs have been reviewed by subject experts all over India that credit this book in being the most accurate and error-free. They have done a commendable work in improving the quality of book. The authors have carefully included the topics and questions keeping in mind that the whole spectrum of every subject is well covered and retained by the aspiring nursing professionals. As I perused through the book, I found it to be a complete package in terms of content and coverage of image-based questions.

This book is like a treasure for the preparation of Staff Nurse Recruitment Examinations and I congratulate both of them to have conceptualized this title in an excellent manner.

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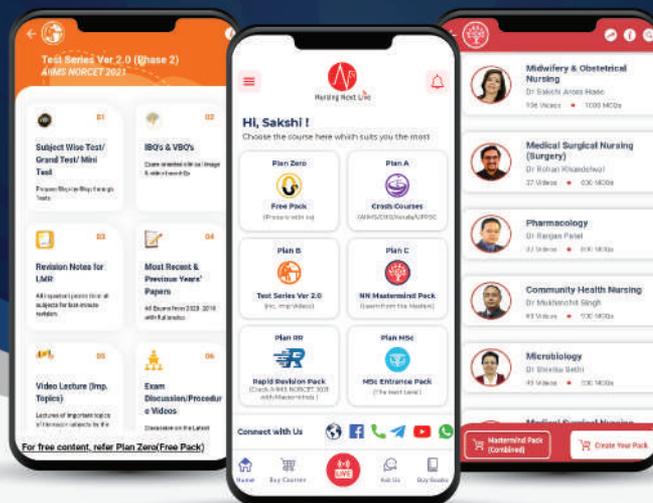
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ATTENTION TO THE READERS!

STOP PIRACY! PROMOTE ORIGINALITY!

Dear All

Target High Staff Nurse Recruitment Examinations has been conceptualized and developed with a sole purpose of benefitting the thousands of staff nurse aspirants across the country by providing them a one-stop solution to everything they need to excel. Authors, publisher and everyone associated with this project aimed to channelize your efforts with this book so as to save your time and money you invest in referring various different resources for the same information.

However, it has come to our notice that widespread illegal distribution of photocopies and PDFs is already taking place in the market. We would like to acquaint you with the fact that Indian Reprographic Rights Organization (IRRO), a copyright society registered under the Copyright Act, permits only up to 15% of a copyrighted work to be reproduced. Also, the usage should be non-commercial and non-profitable. Photocopying the whole book/uploading PDFs or images of the book without the due permission of author or publisher is punishable under the copyright act as it weighs against the fair use policy because completely copying and distributing the work for free online and physically would hinder the economic viability of creating and maintaining the source.

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Publisher

From Authors' Desk

We hope, you and your family are keeping well and coping with the pandemic safely that has been hovering over us for more than two years now. The world has so far witnessed many unfortunate events on account of this pandemic and in these difficult times, healthcare workers are the ones who have always been there for us. The health care workers, especially nurses have been on the forefront looking after us, devoting their valuable time and energy and saving our lives.

Hence, we pay our gratitude to all the nurses and health workers and wish you all a prosperous future since you people will be joining hands with all the healthcare workers in the coming time. With a mention of the 6th Edition of Target High, we would also love to express our gratefulness toward the readers who have contributed their bit in making Target High a huge success.

Serving its purpose profitably with its 5 successful editions, Target High has now come out with more valuable and informative content. Change is the law of nature and the need of the hour, and with this vision, Target High 6th Edition has been thoroughly revised, updated and upgraded in all aspects, so that it can be the best companion for all the Nursing Officer Aspirants.

With the motive of: **Aim High, Achieve High**, we have changed the motto of Target High from **One Nation, One Book** to **One Nation, One NORCET, One Book**, keeping in mind the changing trends in the examination pattern and giving due importance to the top-level examination to set our target higher toward our achievements. All the reviewers, contributors and readers have played a pivotal role in making this compendium reach the next level. And they have made it possible by covering all the required study material that target Nursing Recruitment Examination held in India and in foreign countries. This book is studded with latest information, extensive coverage of questions and exam-centric synopses.

In this edition, we have covered synopsis of each and every subject that has been updated and wrapped in an integrated manner by emphasizing the clinical importance of that relevant topic and focusing on futuristic approach of Nursing Officer Examination. The text of Target High has been supplemented with a number of **Key Point boxes** that cover important facts from the examination point of view, **Notes' boxes** that cover Must-Know-Information, **Recent Questions' boxes** that cover recently held examinations' questions of the relevant topics, like NORCET 2020, CNCI 2020 and many more; which will help students to know what topics they must prepare for the examination.

For the very first time, Subject-wise cum Topic-wise Clinical Case-based questions have been added at the end of the core nursing subjects, like Fundamentals of Nursing, Medical Surgical Nursing, Psychiatric Nursing, Obstetrics and Gynecological Nursing and Pediatric Nursing as per the NCLEX examination pattern. Multiple Choice Questions of each and every subject have been arranged under various topics in Subject-wise cum Topic-wise manner.

The answers to all the questions have been authenticated from various reference resources and controversial questions have been supplemented with their explanations for doubt clarification. Question banks have been enhanced by adding more exam-oriented questions to give the extensive coverage of questions from all the topics so that nothing is missed out. Important one-liners at the end of every subject have been added in a Podcast Format.

New Important and Quick Glance topics have been covered under Appendices. All latest Previous Year Papers have been added to provide glimpses on the recently held examination in one go. General Knowledge section covers all the Current Affairs up to September 2021.

Last but not the least, Target High has come up with the Hybrid Edition this time. The Hybrid Edition is an amalgamation of 'the book and the digital platform'. Readers, now, can read theory from the book and also learn the same concept from the Nursing Next Live App to be taught by AMLI (Target High Virtual Educator). This integrated approach will help students enhance their comprehension, knowledge and level of practice.

The new Hybrid Edition of Target High is like a panacea for all Nursing Exams and is ready to be loved and supported by you all like the previous editions. May you all prepare from stem to stern and achieve the dream job you have been aiming at.

Muthuvenkatachalam Srinivasan

Ambili M Venugopal

From Publisher's Desk

With an aim to provide the nursing fraternity one-stop solution, Target High started its journey in 2015 with its First Edition, and now, it stands firmly with a strong foundation of its wholeheartedly embraced 5 Editions.

As the saying goes:

Gratitude makes sense of our past, brings peace for today, and creates a vision for tomorrow.

I would love to extend my thankfulness to all the readers who have made Target High the Best-Selling Title of India for Any and All Nursing Competitive Exams. I have always been a follower of gratitude, which is why, I would say that the credit of success of this book goes to the students who have shown their trust in this book and have achieved wonderful results in Nursing Examinations. I would like to congratulate all the 100+ Selection Holders for achieving good ranks and getting their dream jobs.



One thing that is inevitable is 'change', and we have to accept the changes, and that is why, we should go wherever the change takes us. Keeping this in mind, Target High always makes significant changes in all its editions and this time, Target High has come up with two new changes or I would rather say two new concepts—**1. One Nation, One NORCET, One Book!** and **2. Hybrid Edition (Book + Digital)**.

The COVID-19 pandemic taught us a lesson that whatever the situation is, the show must go on. Our learning should not be compromised in any case, and implementing on this lesson, we are providing a very strong support to digital learning. Now, students can read from the *Target High Book* and practice from *Target High Lite* (as in Nursing Next Live App). A whole new concept has been introduced where students can emphasize equally on theory as well as on practice and we call this concept "an integrated approach". The motto of this book is to guarantee success through Practice! Practice! And Practice! To make your learning more interesting and simplified, we have introduced yet another unique feature—Your Target High Virtual Educator...AMLI!

In Target High 6th Edition, we are providing you all a lot of new content with new concepts as per the current exam trends, especially, the NORCET! Target High 6th Edition is an outcome of Market Research, Student Feedback, Analysis on Exam Patterns and Approach, How to Make Students' Concepts Building Easy and Simple, Faculty and Reviewers' Feedback, Student Advisors' Suggestions and last but not the least, the thorough hard work of the Authors.

This new edition is a compendium of various new features, like Listen and Recall, Revise on the Go, Dil Mange More Content, Monthly Current Affairs and Updates, Any Doubt? Ask AMLI!, New Attractive Layouts with Integrated Approach, Special Section on COVID-19 Management and a lot more!

6 Amazing Features in the Hybrid of Target High:

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12 Strong Reasons to Refer to the 6th Edition:

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- 3000 Golden Points for Last Minute Revision in Book and Podcast Form.
- 100+ Previous Year (2021-2010) Papers covering 25+ Exams of National and State Level.
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- Special and updated Section on COVID-19 management.
- Attractive Layout with Integrated Approach Theory + Important MCQs side by side.

- MCQs categorized in Subject-wise cum Topic-wise format.
- 600+ Pages of Synopses covering all Subjects, thoroughly Revised Synopses of Fundamentals of Nursing, Community Health Nursing, Pediatric Nursing, Midwifery & Gynecological Nursing, and Medical Surgical Nursing.
- 1000+ Important Tables, Illustrations and Images for clarity of concepts.
- Strong Digital Support with plenty of ADD-ON Content, Only Genuine Buyer of Target High 6th Edition can unlock the content.

With the pledge to guarantee the reliability of information, and hold on to the trust and beliefs of the readers of this book, I feel immensely contented to introduce the Sixth Colored Hybrid Edition of Target High.

However, since no book can become the best seller without feedback and suggestions of the readers, I would appreciate if you all keep sharing your valuable comments and suggestions at: targethigh@nursingnextlive.in. Your every feedback is valuable and holds an important place in the successful outcome of this book.

Have a Very Happy Reading and Wish You All the Very Best for Your Success and Bright Future!

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Acknowledgements

Thanking the Almighty for His Immense Blessings!!!

With humility, we acknowledge our indebtedness to all. Writing a book and updating the matter as per the changing scenario is harder than we thought and more rewarding than we could have ever imagined. None of this would have been possible without your all-incredible support. We are eternally grateful to all of you for playing a vital role during our struggle and success for the Target High Fifth Edition. Now with the blessing and support from all of you, we are presenting **Target High Sixth Premium Colored Hybrid Edition** with a new look, updated and upgraded content, additional features and digital support as per the need and demand of the time.

From the inception, with profound love, we owe sincere gratitude to our parents, siblings and daughters for their unconditional love, support, understanding and forbearance throughout the ups and downs in the journey of this book.

It is very well said that *a teacher is a great source of knowledge, prosperity and enlightenment by which anybody can be benefited*. Our teachers deserve the credit for the gift of their guidance, invaluable suggestions, constructive criticism and perpetual inspiration, which inspired us in our difficult time, kept us motivated and enabled us to complete this book.

We are forever grateful to our teacher, mentor and a great motivator **Dr Sandhya Gupta** Formerly-Principal (Actg.) and Associate Professor, College of Nursing, AIIMS, New Delhi for inspiring and inculcating confidence to write a book. We are indebted to her for the constant support and encouragement in this endeavor. We also want to thank **Dr Latha Venkatesan** Professor cum Principal, College of Nursing, AIIMS New Delhi for being a constant support and a mentor.

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We wish to express our sincere gratitude and regards to all those, who have contributed appropriate and relevant information to this book. Without their dedication, this endeavor might not have been possible.

These acknowledgments will be incomplete without mentioning our beloved students, who have always been our well-wishers, constant supporters and source of learning and encouragement.

We appreciate the support of **Mr Satish Kumar Jain** (Chairman) and **Mr Varun Jain** (Managing Director), M/s CBS Publishers and Distributors Pvt Ltd for their wholehearted cooperation in publication of this book. We have no words to describe the role, efforts, inputs and initiatives undertaken by **Mr Bhupesh Arora**, (Sr. Vice President – Health Sciences Division, Publishing & Marketing), for his endeavor toward the development of the book.

We sincerely thank the entire CBS team for bringing this colorful edition with utmost care and presentation. We would like to thank Ms Nitasha Arora (Publishing Head & Content Strategist – PGME & Nursing Division), Dr Anju Dhir (Product Manager cum Commissioning Editor-Medical), Ms Saumya for her special contribution for playing important role in this edition, Mr Shivendu Bhushan Pandey (Senior Manager and Team Leader) and his entire team of Central Editing Unit, Mr Manoj Kumar Yadav (Production Manager), and Mr Ashutosh Pathak (Senior Proofreader cum Team Coordinator) for putting their hard work and efforts to bring out this book on time and all the production team members for devoting laborious hours in designing and typesetting of the book.

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We owe our special thanks toward all Branch Heads for their contributions for making the reach of this book throughout India and making our motto “**ONE NATION, ONE NORCET, ONE BOOK**” a reality.

We are thankful to our colleagues who helped us to formulate ideas when they did not even know that they were helping. Their involvement has triggered and nourished our intellectual maturity. Once again, we express our heartfelt gratitude to the unstinting support given by our friends and everyone in our team.

Finally, we would like to thank everybody who are important to the successful realization of this book, as well as expressing our apology if we missed anyone's name, which we assure is completely inadvertent.

Luminaries in Nursing

We overcome with felicity in showcasing our gratitude toward the Luminaries in Nursing for they have recommended Target High Series wholeheartedly. A book becomes great because of two important reasons, firstly, the efforts put in by the authors and secondly, when the book is recommended by the elite faculty members. Here, as far as Target High is concerned, the topnotch Luminaries, by their recommendations, have made its success twofold. We express our heartfelt thanks to the Luminaries who always support quality education in Nursing and they believe that quality education should, in every form, be provided to the Nursing Students and Nursing Fraternity.

We, the Target High team, have maintained the high standards of quality education. And the outcome is that the splendid luminaries combinedly proclaim that they recommend Target High as "One Nation, One NORCET, One Book" for Nursing competitive exams.

CBS Team Extends its Whole-Hearted
Thanks to All The Luminaries

"Target High is a Book Worth Reading and hence, Worth Buying"



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We, the authors and the publisher, are grateful to all the reviewers who spent some time from their busy schedules and invested it in reviewing the book, making it most authentic and unique quality compendium.

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Previous Year Papers | Appendices | IBQs & VBQs
Monthly Current Affairs, Recent Updates |
Nursing Skill Procedures and lots more ADD ON Content

? Video-Based Questions (VBQs)

1. Which of the following procedure is being performed in the video?



- a. Ortolani and Barlow test
- b. Anterior drawer test
- c. Lachman test
- d. Flexion rotation drawer test

5. The procedure being performed in the video is:



- a. Pulmonary function test
- b. Incentive spirometry
- c. Alcohol breath test
- d. Urea breath test

2. Which of the following procedure is being performed in the video?



- a. NG tube insertion
- b. OG tube insertion
- c. Sengstaken-Blakemore tube insertion
- d. Guedel's airway insertion

6. The nasal clip used during the procedure shown in the video is to:



- a. Avoid drainage of nasal secretion during the procedure
- b. Achieve a tight seal of the airway
- c. Improve patient comfort during the procedure
- d. Prevent sneezing during procedure

3. All among the following are the advantage of the procedure shown in the video; EXCEPT:



- a. Minimize aerosol generation
- b. Less chance for cross infection
- c. Apply negative pressure throughout the respiratory cycle
- d. Maintain PEEP throughout the respiratory cycle

7. The device shown in the video is:



- a. Jet nebulizer
- b. Mask nebulizer
- c. Ultrasonic nebulizer
- d. Steam inhalation device

4. The specimen collection shown in the videos is for:



- a. RT-PCR
- b. Rapid antigen test for COVID
- c. Sputum culture and sensitivity test
- d. Both a & b

8. The instrument used for the measurement of Mid-Upper Arm Circumference shown in the video is:



- a. Shakir tape
- b. Stadiometer
- c. Edtape
- d. Gulick tape



Ans.

- 1. a
- 2. b
- 3. c
- 4. d
- 5. a
- 6. b
- 7. c
- 8. a



Read from
TARGET HIGH
Book

Appendices

APPENDICES COVERED (in Book)

1. Updates on COVID-19 (New)
2. Management of COVID-19 in Pregnancy (New)
3. Mucormycosis (Black Fungus) (New)
4. Updates on Tuberculosis (New)
5. Updated Questions on COVID-19
6. Slings and Splints
7. Decontamination of Equipment and Unit
8. Some Disease Conditions and their Primary Signs/Symptoms
9. Fetal Circulation and its Postnatal Changes
10. Positions
11. Instruments
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14. Tubes and Catheters
15. Recent Updates on Community Health Nursing
16. Norms for Health Personnel/Centers in Community
17. Cold Chain Methods and Equipment
18. Demography in India
19. Review of Health Programs in India, Launch Year and Objectives
20. Vitamins: Functions, Sources and Deficiency Diseases
21. Health Planning in India
22. Frye's ABCDE Cascade for Prioritizing Care
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24. Arterial Blood Gas
25. Shocks: Types, Management and Solutions
26. Skeletal and Skin Traction
27. ECG Waveforms and Pathological Findings
28. Biomedical Waste Management Rules 2016
29. Common Scales used for Assessment/Treatment
30. Level of Spinal Cord Injury and Associated Motor Loss
31. Neurotransmitters' Chart
32. Interpretation of BMI
33. Positions and Presentations of Fetus during Labor
34. Some Important Social Welfare/Health/Development Programs Launched by Govt. of India from August 2014 Till April 2021

Appendices Covered in
Nursing Next Live App >

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Turn overleaf...

72 Important and Updated Appendices covered



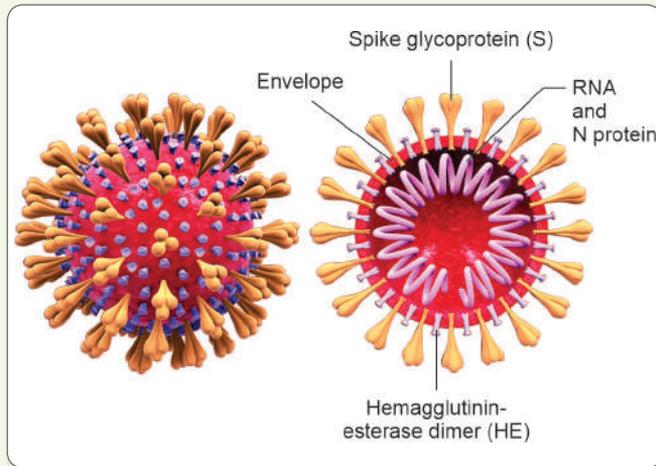
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| 6. Slings and Splints | 30. Level of Spinal Cord Injury and Associated Motor Loss | 53. Comparison of Components for Adults, Children, and Infants BLS/CPR |
| 7. Decontamination of Equipment and Unit | 31. Neurotransmitters' Chart | 54. Stages of Personality Development |
| 8. Some Disease Conditions and their Primary Signs/Symptoms | 32. Interpretation of BMI | 55. EGO Defense Mechanisms with Examples |
| 9. Fetal Circulation and its Postnatal Changes | 33. Positions and Presentations of Fetus during Labor | 56. Phases of Wound Healing Process |
| 10. Positions | 34. Some Important Social Welfare/Health/Development Programs Launched by Govt. of India from August 2014 Till April 2021 | 57. Classification of Mental Retardation |
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| 23. Triage Categories | 47. Types of Insulin | 70. Endocrine Glands and Hormones |
| 24. Arterial Blood Gas | | 71. Acute Coronary syndromes and their Treatment |
| | | 72. Burns |

1

“Nursing is one of the Fine Arts: I had almost said the finest of Fine Arts.”
—Florence Nightingale

UPDATES ON COVID-19



History and Origin of Coronaviruses

- Coronaviruses are large group of viruses that cause illness in humans and animals.
- The outbreak of Novel coronavirus disease (COVID-19) was initially noticed in a seafood market in **Wuhan city in Hubei Province of China** in mid-December, 2019.
- A pneumonia of unknown cause detected in Wuhan, China was first reported to the WHO Country Office in China on 31st December, 2019.
- The outbreak was declared a “Public Health Emergency of International Concern” by WHO on 30th January, 2020.
- WHO declared COVID-19 a pandemic on 11th March, 2020.

Definition of COVID-19 Case

- **Confirmed Case:** A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

Viral Structure

- The coronaviruses are made up of four structural proteins, namely, the spike (S), membrane (M), envelop (E) and nucleocapsid (N) proteins.
- The spike (S) protein is protruding from the viral surface and is the most important for host attachment and penetration.

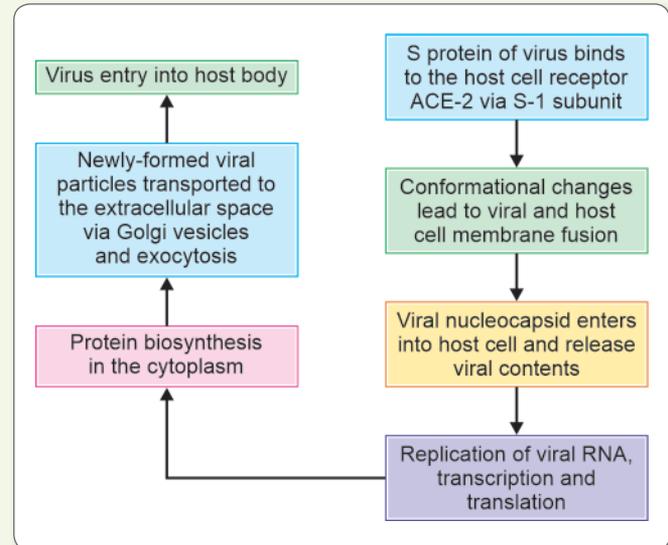
Life cycle of Coronavirus

Life Cycle has 4 Stages

1. Attachment
2. Penetration

3. Maturation

4. Release of new infective materials for community transmission



Ref: Parasher A. COVID-19: Current Understanding of its Pathophysiology, Clinical Presentation and Treatment. *Postgraduate Medical Journal* 2021;97:312-320.

Epidemiology

- Current available evidence for COVID-19 suggests that the causative virus (SARS-CoV-2) has a zoonotic source closely related to **bat-origin SARS-like coronavirus**.
- The severe acute respiratory syndrome (SARS) coronavirus-2 is a novel coronavirus belonging to the family Coronaviridae.
- It is an **enveloped RNA beta coronavirus** related to the Severe Acute Respiratory Syndrome (SARS) virus.
- The virus has been shown to use the angiotensin-converting enzyme 2 (ACE2) receptor for cell entry.
- Source of infection: The persons infected by the novel coronavirus are the main source of infection.

Burden of Disease

- Worldwide:
 - 85% of patients are either asymptomatic or have mild symptoms
 - 15% have moderate to severe disease
 - 5% require critical care
- India
 - 6.4% of active Covid-19 cases need hospitalization
 - Intensive care treatment provided to about 3% of cases

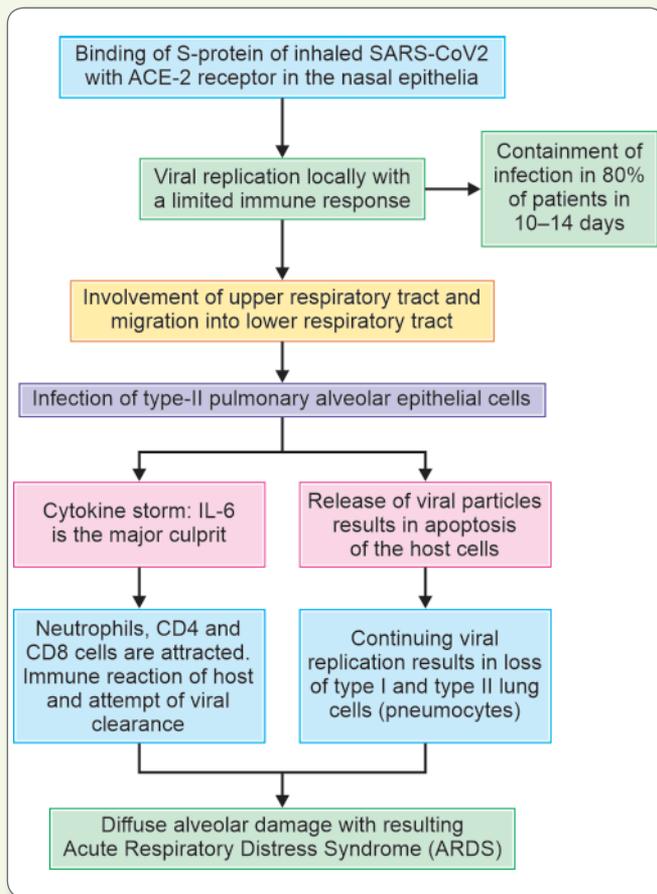




Mode of Transmission

- The virus is transmitted via respiratory droplets and aerosols from person to person.
- Aerosolized droplets are generated through coughing, sneezing or breathing.
- Direct contact with patient and its body fluids including feces.
- Indirect contact with surfaces and fomites.
- Infection can also occur if a person touches an infected surface and then touches his or her eyes, nose, or mouth.
- **Incubation period:** The median incubation period is **5 days (range 2–14 days)**.
- As per the current evidence, the period of infectivity starts 2 days prior to onset of symptoms and lasts up to 8 days.

Pathophysiology



Laboratory Diagnosis

- **Viral tests:**
 - Real time or Conventional RT-PCR test is recommended for diagnosis.
 - Samples are collected from the upper respiratory tract via nasopharyngeal and oropharyngeal swabs. Throat and nasal swab in viral transport media (VTM) to be transported in cold chain
 - For mechanically ventilated patients, expectorated sputum and bronchoalveolar lavage from lower respiratory tract is used
- Antigen based rapid tests for on the spot detection.
- **High Resolution CT (HRCT)**
 - Multifocal bilateral ‘ground or ground-glass’ areas in the lungs
 - ‘Reverse halo sign’
 - Cavitation, calcification and lymphadenopathy
- Lab findings
 - Decreased WBC count
 - Increased D-dimer
 - Increased PT/INR
 - Increased levels of AST, and LDH
 - Increased levels of C-Reactive Protein and Serum ferritin

Clinical Features

- Fever, cough, Fatigue, Shortness of breath, Expectoration, Myalgia, Rhinorrhea, sore throat, diarrhea, Loss of smell (anosmia) or loss of taste (ageusia) preceding the onset of respiratory symptoms.
- As per data from Integrated Health Information Platform (IHIP)/ Integrated Disease Surveillance Programme (IDSP), the common signs and symptoms reported are (as on 11.06.2020)
 - Fever (27%)
 - Cough (21%)
 - Sore throat (10%)
 - Breathlessness (8%)
 - Weakness (7%)
 - Running nose (3%)
 - Others 24%

Risk Factors

- Advanced age (age > 60 years)
- Underlying noncommunicable diseases (immune-suppression, diabetes, hypertension, cardiac disease, chronic lung disease, cerebrovascular disease, Chronic kidney disease, and cancer.

Severity of Cases and Management Guidelines

Clinical severity	Clinical presentation	Management
Mild	<ul style="list-style-type: none"> • Patients with upper respiratory tract symptoms (with or without fever) without shortness of breath or hypoxia 	<ul style="list-style-type: none"> • Home isolation and care • Physical distancing, indoor mask use, strict hand hygiene • Symptomatic management (hydration, antipyretics, antitussives, multivitamins) • Seek immediate medical attention if there is: <ul style="list-style-type: none"> ▪ breathing difficulty ▪ high grade fever/severe cough for >5 days. • Tab Ivermectin (200 mcg/kg OD for 3 days OR Tab HCQ 400 mg BD for 1 day followed by 400 mg OD for 4 days if not contraindicated. • Inhalational Budesonide for 5 days





Clinical severity	Clinical presentation	Management
Moderate	Any one of: 1. Respiratory rate >24/min, breathlessness 2. SpO ₂ : 90% to <93% on room air	ADMIT IN WARD <ul style="list-style-type: none"> Oxygen support with a target of 90–94% (88–92% in COPD patients) Non-rebreathing face mask is preferred Awake proning encouraged in all patients Anti-inflammatory: Inj. Methylprednisolone 0.5–1 mg/kg in 2 divided doses (or an equivalent dose of dexamethasone) usually for a duration of 5–10 days. Anticoagulation: Weight based conventional dose of prophylactic unfractionated heparin or Low Molecular Weight Heparin (e.g., Enoxaparin 0.5 mg/kg/dose SC BD) if not contraindicated. Monitor for work of breathing, Hemodynamic instability, Change in oxygen requirement. Serial CXR; HRCT chest to be done ONLY if there is worsening of symptoms Lab monitoring: CRP and D-dimer 48–72 hrly; CBC, KFT, LFT 24–48 hrly; IL-6 levels to be done.
Severe	Any one of: 1. Respiratory rate >30/min, breathlessness 2. SpO ₂ < 90% on room air	ADMIT in ICU <ul style="list-style-type: none"> Respiratory support: consider non-invasive ventilation (helmet or facemask) in patients with increasing oxygen requirement Consider use of High-Flow Nasal Canula (HFNC) in patients with increasing oxygen requirement. Intubation should be prioritized in patients with high work of breathing/if NIV is not tolerated. Inj Methylprednisolone 1–2 mg/kg IV in 2 divided doses (or an equivalent dose of dexamethasone) usually for a duration of 5–10 days. Anticoagulation: Weight based intermediate dose prophylactic unfractionated heparin or Low Molecular Weight Heparin (e.g., Enoxaparin 0.5 mg/kg per dose SC BD). Monitoring: Serial CXR; HRCT chest to be done ONLY if there is worsening of symptoms Lab monitoring: CRP and D-dimer 48–72 hrly; CBC, KFT, LFT 24–48 hrly; IL-6 levels to be done.

Source: AIIMS/ICMR-COVID-19 National task force guidelines dated May 17, 2021.

Emergency Use Authorization (EUA/Off-label) (based on limited available evidence and only in specific circumstances)

- **Remdesivir** (EUA) may be considered ONLY in patients with:
 - Moderate to severe disease (requiring SUPPLEMENTAL OXYGEN), AND
 - No renal or hepatic dysfunction (eGFR 5 times ULN (Not an absolute contradiction), AND
 - Who are within 10 days of onset of symptom/s.
 - Recommended dose: 200 mg IV on day 1 f/b 100 mg IV OD for next 4 days.
 - Not to be used in patients who are NOT on oxygen support or in home settings
- **Tocilizumab** (Off-label) may be considered when ALL OF THE BELOW CRITERIA ARE MET
 - Presence of severe disease (preferably within 24–48 hours of onset of severe disease/ICU admission).
 - Significantly raised inflammatory markers (CRP and/or IL-6).
 - Not improving despite use of steroids.

- No active bacterial/fungal/tubercular infection.
- Recommended single dose: 4–6 mg/kg (400 mg in 60 kg adult) in 100 mL NS over 1 hour.

Source: AIIMS/ICMR-COVID-19 National task force guidelines dated May 17, 2021.

Infection Prevention Control Practices

- At triage: Give suspect patient a triple layer surgical mask and direct patient separate area or an isolation room if available
- Apply standard precautions: Include use of Personal Protective Equipment (PPE), appropriate patient placement, prevention of sharp injury, safe biomedical waste management, cleaning and disinfection of equipment and environment
- Apply droplet precautions
- Apply contact precautions
- Apply airborne precautions when performing an aerosol generating procedure.





3

“Ill-health of body or of mind, is defeat. Health alone is victory.”
—Thomas Carlyle

MUCORMYCOSIS (BLACK FUNGUS)

Introduction

- Mucormycosis (previously called **zygomycosis**) is a serious but rare fungal infection caused by a group of molds called mucormycetes.
- These molds live throughout the environment but they mainly affect people who have compromised immunity (immunosuppressed patients)
- This infection most commonly affects the sinuses or the lungs after inhaling fungal spores from the air.
- It can also occur on the skin after a cut, burn, or other type of skin injury.

Types of Mucormycosis

- **Rhinocerebral mucormycosis:**
 - Affects sinuses that can spread to the brain.
 - It is the most common type in people with uncontrolled diabetes and in people who underwent renal transplantation.
- **Pulmonary mucormycosis (affects lungs)**
 - It is the most common type in people with cancer and in people who have had an organ transplant or a stem cell transplant.
- **Gastrointestinal mucormycosis**
 - More common among young children than adults, especially premature and Low Birth Weight (LBW) infants
- **Cutaneous mucormycosis (affects skin)**
 - Most common form of mucormycosis among people who do not have weakened immune systems.
- **Disseminated mucormycosis**
 - Occurs when the infection spreads through the bloodstream to affect another part of the body.

Types of Fungi that Commonly Cause Mucormycosis

- *Rhizopus* species, *Mucor* species, *Rhizomucor* species, *Syncephalastrum* species, *Cunninghamella bertholletiae*, *Apophysomyces* species, and *Lichtheimia* (formerly *Absidia*) species

Risk Factors

- **Diabetes, especially with ketoacidosis**
- **Organ transplant, stem cell transplant**

- **Cancer**
- **Neutropenia**
- **Long-term corticosteroid use**
- **Iron overload of hemochromatosis**
- **Skin injury**
- **Prematurity and low birth weight**

Signs and Symptoms

- **Rhinocerebral mucormycosis:** One-sided facial swelling, headache, nasal or sinus congestion, black lesions on nasal bridge or upper inside of mouth that quickly become more severe and fever
- **Pulmonary mucormycosis:** Fever, cough, chest pain and shortness of breath
- **Cutaneous mucormycosis:** Blisters or ulcers, and the infected area may turn black. Other symptoms include pain, warmth, excessive redness, or swelling around a wound
- **Gastrointestinal mucormycosis:** Abdominal pain, nausea and vomiting, and gastrointestinal bleeding
- **Disseminated mucormycosis:** Patients with disseminated infection in the brain can develop mental status changes or coma

Diagnosis

Fluid sample from respiratory system for lab analysis, biopsy, CT scan of sinuses, lungs or other affected body parts.

Treatment

- Antifungal drugs:
 - IV: Amphotericin B, posaconazole, or isavuconazole.
 - Oral: posaconazole, isavuconazole.
 - Other antifungal drugs, including fluconazole, voriconazole, and echinocandins, DO NOT work against fungi that cause mucormycosis.
- Surgery: Often, mucormycosis requires surgery to cut away the infected tissue.

Note: Mucormycosis can't spread between people or between people and animals.

Source: Centers for Disease Control and Prevention (CDC).





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Section **A**

Subject-wise Synopsis
CBQs, IBQs & MCQs

SUBJECTS COVERED

- Medical Surgical Nursing
- Fundamentals of Nursing
- Pharmacology
- Community Health Nursing
- Psychiatric Nursing
- Obstetric and Gynecological Nursing
- Pediatric Nursing
- Nursing Education
- Nursing Research and Statistics
- Nursing Administration and Management
- Microbiology
- Biochemistry and Nutrition
- Introduction to Computer & Nursing Informatics

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Subjects	MCQs Tests		IBQs Tests		Total Tests
	No. of Tests	No. of Qs.	No. of Tests	No. of Qs.	
Medical Surgical Nursing	5	500	1	30	6
Fundamentals of Nursing	3	300	1	10	4
Pharmacology	2	200	1	10	3
Community Health Nursing	3	300	1	20	4
Psychiatric Nursing	3	300	1	10	4
Obstetric and Gynecological Nursing	3	300	1	20	4
Pediatric Nursing	3	300	1	20	4
Nursing Education	1	50	-	-	1
Nursing Research and Statistics	1	100	1	10	2
Nursing Administration and Management	1	50	-	-	1
Microbiology	1	50	1	10	2
Biochemistry and Nutrition	1	50	-	-	1
Introduction to Computer & Nursing Informatics	1	50	-	-	1
Total	28 Tests	2550 MCQs	9 Tests	140 IBQs	37 Tests

5 Grand Tests (1000 Qs with their Rationale)

focussing **AIIMS NORCET 2022-23**

Subject-wise Synopsis, Golden points, CBQs, IBQs and MCQs Covered

Glimpses of Target High 6th Hybrid Edition



Medical Surgical Nursing (Topic-wise Approach)

Topic-wise Questions Segregation

TOPICS	QUESTIONS NO.	PAGE NO.
➤ Inflammation and Wound Healing	1–57	7–10
➤ Immune System	58–132	16–20
➤ Musculoskeletal System	133–444	40–55
➤ Gastrointestinal and Hepatobiliary System	445–934	83–107
➤ ENT System	935–1032	115–120
➤ Ophthalmology	1033–1158	133–139
➤ Integumentary System and Burns	1159–1332	149–158
➤ Respiratory System	1333–1589	173–187
➤ Cardiovascular System	1590–2020	211–233
➤ Hematology	2021–2319	245–258
➤ Renal System	2320–2562	273–283
➤ Endocrine System	2563–2806	294–306
➤ Nervous System	2807–3151	325–345
➤ Oncology	3152–3403	357–370
➤ Male Reproductive System	3404–3495	377–381
➤ Perioperative Nursing Care	3496–3573	391–396
➤ Homeostasis, Emergency and Critical Care Nursing	3574–3783	407–419
Total Questions	3783	

Subject presented in an integrated and topic-wise approach

"It is health that is real wealth and not pieces of gold and silver."
—Mahatma Gandhi

MEDICAL SURGICAL NURSING



SYNOPSIS

INFLAMMATION AND WOUND HEALING

INFLAMMATION

Definition: Inflammation is a localized reaction intended to neutralize, control or eliminate the offending agent to prepare the site for repair.

Five Cardinal Signs of Inflammation

1. Redness
2. Warmth (Heat)
3. Swelling
4. Pain
5. Loss of function

Chemical Mediators

- a. Histamine released by mast cells at the site of injury causes vasodilation and vascular permeability.
- b. Kinins are responsible to attract neutrophils.
- c. Prostaglandins cause increased vascular permeability.

Three Phases of Inflammation

Phase 1: Inflammatory response (3-5 days)

- a. Transient vasoconstriction occurs immediately after injury followed by vasodilation and increased capillary permeability which results in redness, swelling and warmth.
- b. Exudate consists of plasma, plasma proteins, solutes, WBCs, etc., migrate into tissues resulting in pressure of fluid on nerve endings (*pain and loss of function*).
- c. Leukocytes are responsible for engulfing offending organisms and for removing cellular debris. (*phagocytosis by macrophages*).

Phase 2: Repair and Regeneration (2-8 weeks)

- a. It is characterized by new collagen formation.
- b. These fibers are laid down in disorganized manner to make scar but the link between fibers is weak.

Thus new tissue is susceptible to disruption on aggressive activity.

Phase 3: Remodeling and Maturation (Months to years)

- a. In this phase, tissue continues to remodel, strengthen and improve its cellular organization.
- b. Increase in organization of collagen fibers and bonds become stronger.

Exudate

The fluid involved in inflammatory edema is known as exudate.

- a. **Serous exudate:** Water-like exudate; seen in minor injury
- b. **Fibrinous exudate:** Contains fibrin
- c. **Purulent exudate (pus):** Creamy white exudate from dead neutrophils; seen in bacterial infection
- d. **Hemorrhagic exudate:** Bloody red exudate

WOUND HEALING

Definition: Wound healing is a complex and dynamic process of replacing devitalized and missing cellular structures and tissue layers.

TYPES OF WOUNDS

- **Acute wound:** Heals without many complications within expected time frame, e.g., surgical wounds and trauma wounds.
- **Chronic wound:** Underlying pathology or infection causes wound or interferes with the healing process. For example, diabetic ulcer and pressure ulcer.

Note

Fever is systemic response of inflammation.



Recent Questions (NORCET 2020)

1. Which of the following is incorrect about bed sore

- a. Mobilization will affect bed sore
- b. Moisture will affect bed sore
- c. Friction force will affect bed sore
- d. Nutritional status does not affect bed sore

Ans. (d) Nutritional status does not affect bed sore...

2. A 65-year-old patient admitted in a long-term care facility has developed pressure ulcer. On assessment, the nurse found that the bone is visible and palpable on the wound site. The nurse knows that the stage of the pressure ulcer is...

- a. Stage-I
- b. Stage-II
- c. Stage-III
- d. Stage-IV

Ans. (d) Stage-IV



GASTROINTESTINAL AND HEPATOBILIARY SYSTEM

GASTROINTESTINAL SYSTEM

Anatomy and Physiology of GI System

- GI system extends from mouth to anus and the total length is 23–26 feet.
- Part of GI system includes mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum and anus.

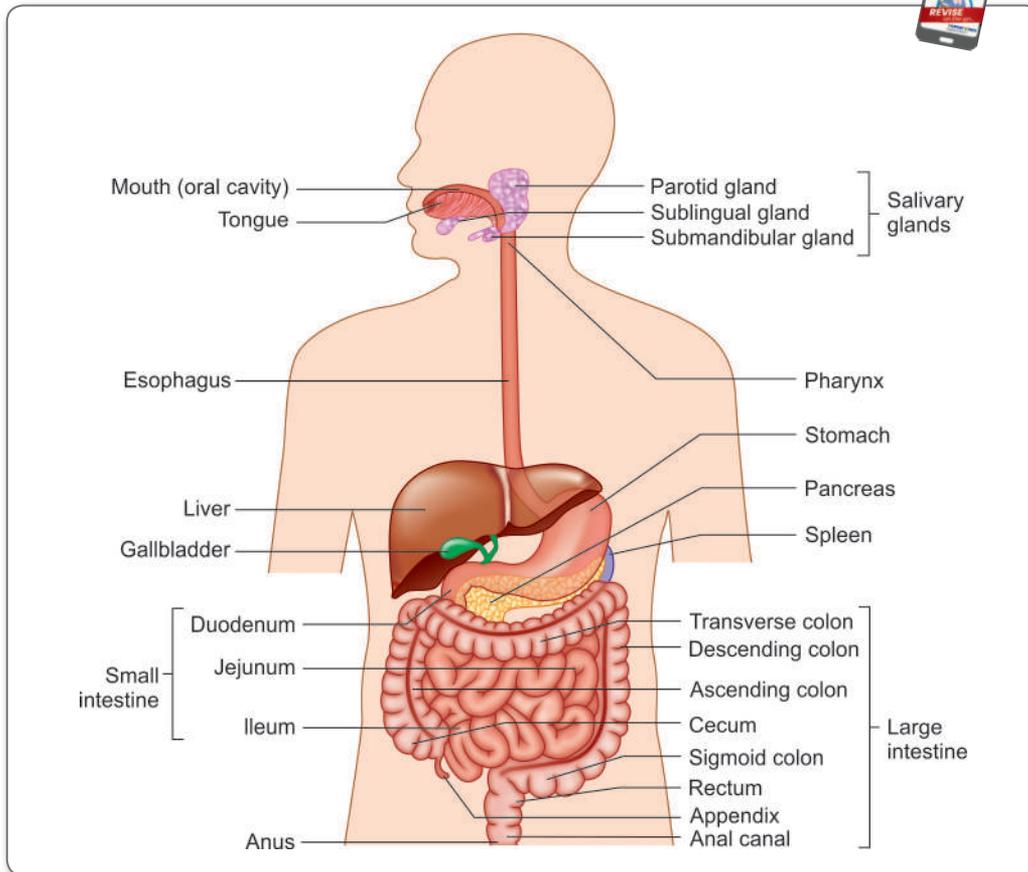


Figure 20 ■ Gastrointestinal system

Mouth

- Mouth is the first site of digestion.
- Three pairs of salivary glands are named as:
 - Parotid
 - Submaxillary (submandibular), and
 - Sublingual glands secrete saliva to the oral cavity.
- Approximately 1.5 L of saliva is secreted daily.



Key Point

- Average of length of Gastrointestinal tract—7–9 meter (23–30 feet)



Recent Questions (NORCET 2020)

6. Which of the following vitamin deficiency leads to bleeding gums

- Vitamin C
- Vitamin A
- Vitamin B
- Vitamin K

Ans. (a) Vitamin C

7. Oral white patches which is commonly seen in infant which bleeds on touching is

- Pancytopenia
- Leukoplakia
- Leucopenia
- Myeloma

Ans. (b) Leukoplakia



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HEPATIC BILIARY SYSTEM

Anatomic and Physiological Review of Hepatic Biliary System and Pancreas

Liver

- Liver is the largest gland in the body, located in the right upper quadrant. It weighs about 1500 gm and divided into 4 Lobes
- Lobes are further divided into lobules.

- Kupffer cells are the phagocytic cells present in the liver.
- Smallest bile duct called canaliculi are located between the lobules of liver.
- Canaliculi carry bile secreted by hepatocytes to larger bile duct, which eventually become hepatic duct.
- Hepatic duct from liver and cystic duct from gallbladder join to form common bile duct which empties bile into the duodenum of small intestine.

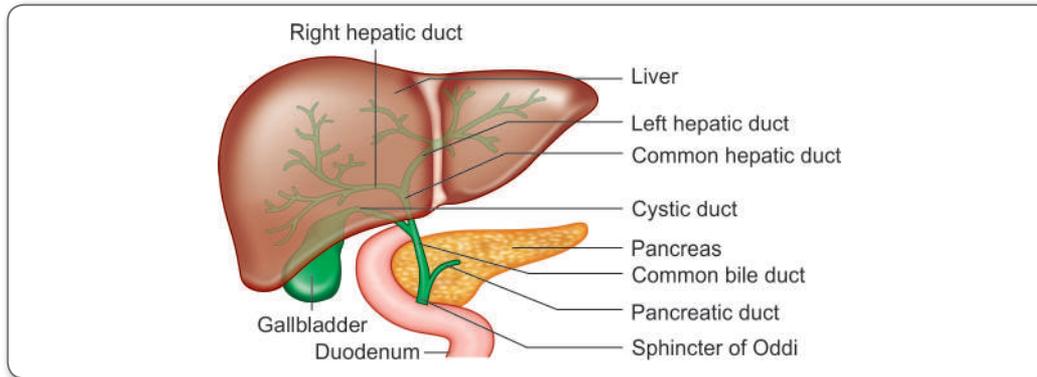


Figure 33 ■ Biliary tree

Functions of Liver

- **Glucose metabolism:** After digestion, glucose is converted to glycogen and whenever the body requires, glycogen is converted to glucose:
 - **Glycogenesis:** Glucose is converted and stored as glycogen
 - **Glycolysis:** Glycogen is converted back to glucose
 - **Gluconeogenesis:** Glucose is synthesized from non-carbohydrate substances such as protein and amino acids.
- **Ammonia conversion:** Protein and amino acid metabolism leads to ammonia generation. Liver converts this highly toxic ammonia to urea for excretion.
- **Protein metabolism:** Liver synthesizes all plasma protein (except gamma globulin) such as albumin, alpha and beta globulins.
- **Fat metabolism:** When glucose is not available, fatty acids are broken down for the production of energy.
- **Vitamin and iron storage:** Liver stores large amount of vit A, D, E, K and vit. B12 and it also stores iron and copper.

- **Drug metabolism:** Liver is a major site for drug metabolism
- **Bile formation:** Hepatocytes synthesize bile and stores in gallbladder. Bile salts are formed from cholesterol

Enterohepatic Bilirubin Circulation

- Bilirubin is released from the breakdown of RBCs at reticuloendothelial system
- Hepatocytes convert this bilirubin (unconjugated) to conjugated bilirubin by mixing it with glucuronic acid which is more soluble in aqueous solution.
- Later conjugated bilirubin in the hepatocytes will be secreted along with bile into the duodenum.
- In the small intestine, bilirubin is converted as urobilinogen.
- A part of urobilinogen is excreted via feces, another part is reabsorbed in the small intestine. It reaches the liver via portal vein and the remaining part enters the systemic circulation and is excreted via kidneys in urine.



Key Points

- The liver is situated mainly at **right hypochondrium**, extending through the epigastrium and reaching the left hypochondrium.
- **Kupffer cells** are specialized macrophages located in the liver.
- **In the liver**, bacteria that found their way into portal circulation are destroyed by **Kupffer cells**.
- Bile secretion - 500 to 1000 mL/day
- Bile is called pseudodigestive juice because it does not contain any digestive enzymes.



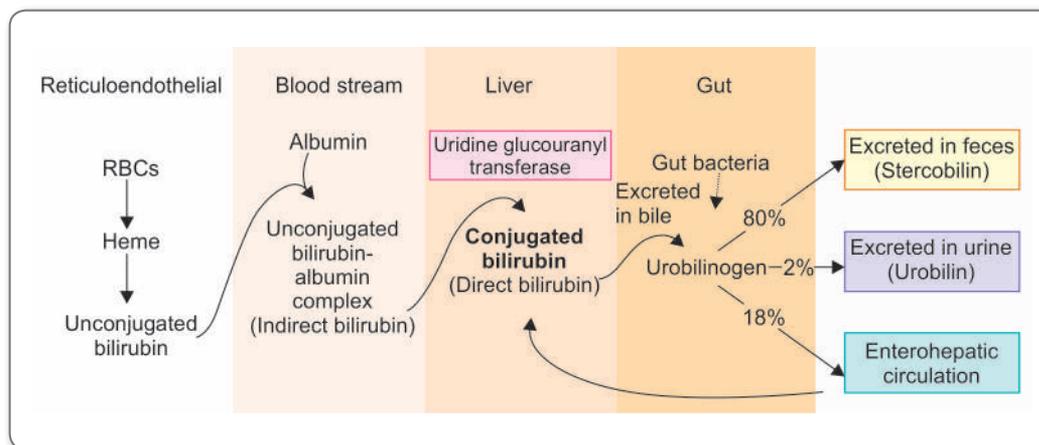


Figure 34 ■ Production and enterohepatic circulation of bilirubin



Key Points

- Pancreas is both endocrine and exocrine gland (99% exocrine and 1% endocrine).
- Beta cells of Islets of Langerhans concentrated in tail portion of pancreas secrete insulin.
- The opening of the pancreatic duct into the duodenum is at the ampulla of Vater.
- Majority of the **pancreatic cancer** arises at the head of the pancreas.

Gallbladder

- It is a pear shaped organ of 7.5-10 cm in size.
- Capacity of gallbladder is 30-50 mL.
- Gallbladder is connected to common bile duct by the cystic duct.
- Functions of gallbladder are:
 - To store bile
 - Water content of the bile is absorbed by gallbladder wall during storage and the bile becomes 5-10 times concentrated.

Pancreas

- It has both endocrine as well as exocrine functions in the body.
- Secretion of pancreatic juice via pancreatic duct represents exocrine function
- Alpha cells of pancreas produce **glucagon** and beta cells of pancreatic islets produce **Insulin**.
- Pancreatic enzymes are given as follows:

Table 23: Pancreatic enzymes

Pancreatic enzyme	Substrate
Trypsin, Chymotrypsin Carboxy Peptidase	Protein
Pancreatic amylase	Carbohydrate
Pancreatic lipase, Cholesterol esterase, Phospholipase	Fats

Diagnostic Tests

Table 24: Description of diagnostic tests

Name of the tests	Description	Points to keep in mind
Liver function test (LFT) (Please refer Synopsis of FON for normal ranges of LFT)	It is a blood serum test which assesses liver functions in terms of serum enzymatic activity	<ul style="list-style-type: none"> • Serum enzymes monitored are: <ul style="list-style-type: none"> ■ Alkaline phosphate ■ Lactic dehydrogenase ■ Serum aminotransferase • Albumin • Globulin • Bilirubin • Ammonia
Liver biopsy	Removal of small amount of liver tissue, usually through needle aspiration	<ul style="list-style-type: none"> • Coagulation study has to be obtained before biopsy • Informed written consent • Left lateral or supine position during the procedure • Ask the patient to exhale and hold the breath then introduce the needle • Immediately after the procedure, place the client in right side and place pillow under right costal margin. This is to prevent bleeding. • Instruct the patient to avoid coughing and straining.





Disorders and Diseases of Hepatobiliary System

Jaundice

- When the bilirubin level in the blood is elevated, all the body tissues such as sclera and skin become yellowish or greenish yellow.
- This discoloration occurs when bilirubin is >2.5 mg/dl.

Table 25: Comparison of hemolytic, hepatocellular and obstructive jaundice

Hemolytic jaundice (Prehepatic)	Hepatocellular jaundice	Obstructive jaundice (Post hepatic)
<ul style="list-style-type: none"> • Hemolysis (destruction of RBCs) results in increased bilirubin in the blood • Liver is unable to conjugate excessive bilirubin from hemolysis • Elevated unconjugated bilirubin is seen in serum • It is seen in patients with hemolytic transfusion reaction and other hemolytic disease • Normal prothrombin time 	<ul style="list-style-type: none"> • Damaged hepatic cells can't clear the bilirubin in the blood. • Both conjugated and unconjugated bilirubin elevated. • Abnormal prothrombin time; not corrected with Vit K. 	<ul style="list-style-type: none"> • Impaired excretion of bilirubin due to mechanical obstruction of biliary tract • Extrahepatic obstruction occurs as a result of occlusion of the bile duct by gall stone. • Intrahepatic obstruction resulting from stasis of bile within the canaliculi. • Mainly (>50%) elevated levels of Conjugated bilirubin is seen in serum. • Abnormal prothrombin time; corrected with Vit K.

Portal Hypertension

- Obstructed blood flow through the liver resulting in increased blood pressure is known as portal hypertension.
- Splenomegaly is a common manifestation in portal hypertension.
- Consequences of portal hypertension include ascites and varices.

Ascites

- Fluid accumulates in the abdominal cavity.
- Fluid moves from vascular system into peritoneal space due to
 - Sodium and water retention
 - Increased intravascular blood volume
 - Decreased albumin synthesis
- **Signs and symptoms**
 - Increased abdominal girth
 - Rapid weight gain
 - Shortness of breath
 - Striae (stretch marks) and distended veins
- **Management**
 - Sodium restriction
 - Diuretics
 - **Paracentesis:** Needle is inserted into peritoneal cavity to remove fluid from the abdominal cavity.
 - Patient is placed in supine position during procedure
 - Slightly rotated to the side of the procedure (to minimize the risk of perforation)
 - Left lateral approach is preferred (cecum is relatively fixed on right)

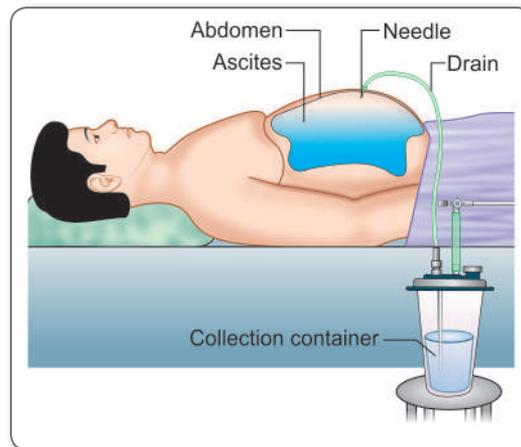


Figure 35 ■ Paracentesis

Esophageal Varices

- Esophageal varices are dilated tortuous veins usually found in submucosal layer of lower esophagus.
- **Cause**
 - In case of portal obstruction, blood from intestinal tract and spleen seek a new pathway via esophageal plexus.
 - Esophageal plexus is not elastic so it becomes tortuous, fragile and bleed easily.
- **Clinical manifestation**
 - Hematemesis, melena and symptoms of shock are the common manifestations.



Key Points

- Rapid removal of fluids from the abdominal cavity during paracentesis leads to decreased abdominal pressure which can cause vasodilation and shock.
- **Icterus (jaundice)** is a sign that is present if a patient is experiencing hepatic coma.
- **Clay-colored stools** is the sign of obstructive jaundice
- Variceal hemorrhage is the most common complication associated with portal hypertension.



Recent Question (CNCI 2021)

- 11. The most likely cause of fluctuating jaundice in a middle aged/elderly man is**
- Periampullary cancer
 - Liver fluke infestation
 - Choledochal cyst
 - Carcinoma head of pancreas

Ans. (a) Periampullary cancer



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Management

- Vasopressin, somatostatin, octreotide are the drug of choice to decrease the bleeding.
- **Balloon tamponade:** It is done with **Sengstaken-Blakemore tube**.
- **Endoscopic sclerotherapy:** Sclerosing agent is injected into the bleeding varices to promote healing.
- **Esophageal banding therapy/variceal band ligation:** Elastic rubber band is slipped over (through endoscope) the bleeding varices, which causes necrosis of the bleeding varices.
- **Transjugular intrahepatic portosystemic shunt (TIPS):** Intrahepatic shunt is created between portal circulation and hepatic vein.
- **Surgical management:** Surgical ligation of bleeding varices and esophageal transection and devascularization.
- **Surgical bypass procedures:** These procedures help to drain a portion of portal blood and thereby help to reduce portal pressure.

- Spleno-renal shunt, Mesocaval shunt and Portocaval shunt

Sengstaken-Blakemore tube

- Sengstaken-Blakemore tube has got 3 lumens (ports for gastric and esophageal balloon and gastric aspiration)
- Minnesota tube has 4 lumens and two balloon (has an esophageal aspiration port in addition to the gastric aspiration port).
- Purpose of lumens are gastric aspiration, esophageal aspiration, gastric balloon inflation, esophageal balloon inflation.
- Stomach balloon is inflated with 100-200 mL of air. X-ray confirms the position of gastric balloon. Then gastric balloon is pulled against cardiac part of stomach.
- Irrigation of the tube is done to detect bleeding. If return from irrigation is clear, esophageal balloon will not be inflated.
- If bleeding is present, then esophageal balloon will be inflated.

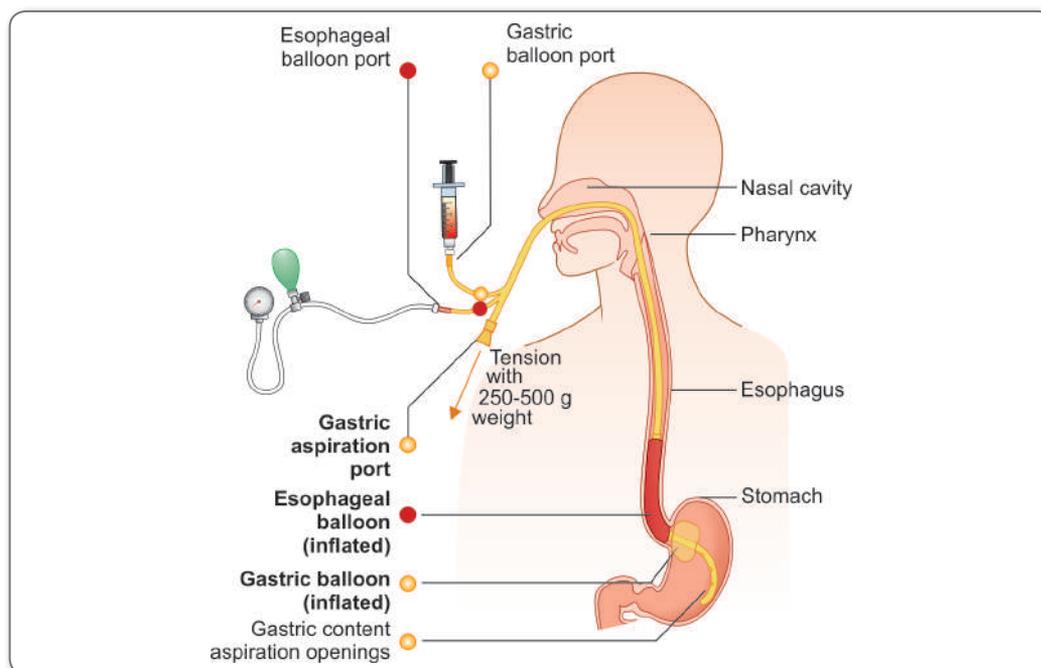


Figure 36 ■ Sengstaken-Blakemore tube

- Pressure in the esophageal balloon is – 25 mm Hg
- Pressure in gastric balloon is – 40 mm Hg.
- Once the bleeding varices stop, first esophageal balloon will be deflated. After several hours without bleeding, gastric balloon will be deflated.
- If several bleeding free hours are there, then the tube will be removed.

Liver Abscess

- **Pyogenic and amebic abscesses are the most common type of abscess**
- Amebic abscess is caused by *entamoeba histolytica*
- **Clinical manifestation:** Fever, right upper quadrant pain, anorexia, nausea, vomiting, hepatomegaly, jaundice

Practice Question

8. The patient has a **Sengstaken-Blakemore Tube** inserted to stop bleeding in the stomach. Which of the following statement about this tubing is **NOT** true?

- a. It is a four-lumen gastric tube
- b. Irrigation of the tube is done to detect bleeding
- c. It is used to stop bleeding in patients with esophageal varices
- d. Scissors is kept at the bedside for emergency use with this tubing type

Ans. (a) It is a four-lumen gastric tube



Key Point

- **Scissors is an emergency bedside article** needs to be kept with a client with **Sengstaken-Blakemore tube** because rupture of balloon or migration of balloon to the oropharynx can cause life-threatening airway obstruction and asphyxiation.



- **Diagnosis:** CT, MRI, aspiration and analysis of liver abscess under CT and MRI guidance.
- **Management:** Antibiotics, drainage of cyst.

Hepatic Encephalopathy and Coma

- Failed liver cells are unable to convert ammonia to urea, as a result ammonia accumulates in the blood stream.
- Hepatic encephalopathy occurs due to accumulation of ammonia (toxic to brain cells) and other metabolites in the blood.
- Hepatic coma is the most advanced stage of hepatic encephalopathy.
- **Earliest symptoms of hepatic encephalopathy**
 - Minor mental changes and motor disturbances
- **Asterixis** flapping tremors of the hands occur in this condition and simple tasks like writing becomes difficult.
- **Inability to reproduce a simple image is known as constructional apraxia.**

- In the initial stage of hepatic encephalopathy, deep tendon reflexes are hyperactive and with the worsening of disease, these reflexes disappear and extremity becomes flaccid.
- **Fetor hepaticus:** A sweet, slightly fecal odor of the breath can be there which is intestinal in origin.
- **Management**
 - Lactulose is administered to reduce serum ammonia level. It helps in excretion of ammonia through bowel.
 - Eliminate protein from diet to reduce serum ammonia.
 - Administration of neomycin sulfate reduces the number of intestinal bacteria which are capable of converting urea to ammonia.

Viral Hepatitis

The viruses which are responsible for viral hepatitis and their modes of remission have been tabulated as:



Table 26: Types of virus hepatitis

Types of hepatitis	Types of virus	Incubation period	Mode of transmission
Hepatitis A (Infectious hepatitis)	RNA Virus	15–45 days	Fecal-oral route
Hepatitis B (Serum hepatitis)	DNA Virus	28–180 days	Parenteral, serum, saliva, semen and vaginal secretion
Hepatitis C	RNA Virus	15–160 days	Parenteral Commonly associated with Blood Transfusion.
Hepatitis D	RNA Virus	28–180 days	Parenteral. It requires Hep B surface antigen for its replication. So it is seen in only those who are affected with Hep B
Hepatitis E	RNA virus	14–63 days	Fecal-oral route

- **Investigations**
 - **Hepatitis A:** Antibody, IgM
 - **Hepatitis B:** IgM and HBSAg
 - **Hepatitis C:** Antibody
- **Management**
 - Supplementation of vitamins
 - Fat digestion will be affected so need to have diet control
 - Antiviral drugs are used in treatment of this condition.

Hepatic Cirrhosis

- Replacement of normal liver tissue with fibrotic tissue that disrupts normal structure and function of liver. It can be classified as:
 - **Alcoholic cirrhosis (micronodular):** Chronic consumption of alcohol leads to cirrhosis and is the **most common type of cirrhosis**



- **Post-necrotic cirrhosis (macronodular):** Cirrhosis occurs as a result of any infection or inflammation to liver such as hepatitis
- **Biliary necrosis:** Scarring occurs around the bile duct. As a result of chronic biliary obstruction and infection
- **Cardiac:** Caused by right-sided heart failure
- **Incidence**
 - It is twice as common in men as compared to women, peak incidence at 40 – 60 years of age.
- **Signs and symptoms**
 - Anorexia, nausea, vomiting, weight loss, constipation or diarrhea
 - Jaundice and hepatic encephalopathy may occur
 - **Complications:** Ascites, esophageal varices, portal hyper-tension and peripheral edema may occur



Recent Question (NORCET 2020)

- 12. Which of the following is not transmitted by needle stick injury**
- HIV
 - Hepatitis B
 - Scrub Typhus
 - Hepatitis C

Ans. (c) Scrub Typhus



Recent Questions (CNCI 2021)

- 13. While providing care to a patient with Hepatitis, the nursing officer should take special precautions to _____.**
- Prevent droplet spread of infection
 - Use caution when bringing food for PT
 - Wear mask and gown before entering the room
 - Use gloves when removing the patient's bed pan

Ans. (d) Use gloves when removing the patient's bed pan

- 14. Kernicterus, which may occur as a complication of jaundice is a pathological condition of:**

- Liver
- Brain
- Kidney
- Heart

Ans. (b) Brain



- Decreased synthesis of bile affects the absorption of fat soluble vitamins.
- **Coagulation abnormalities** due to deficiency of vitamin K and clotting factors II, VII, IX and X.
- **Treatment**
 - Paracentesis to remove ascetic fluid (if present); Peritoneovenous shunt may be used
 - Potassium-sparing diuretic to treat ascites and peripheral edema
 - Vitamin K—to reduce bleeding tendency
 - Lactulose—to treat hepatic encephalopathy
 - Vasopressin—to treat bleeding esophageal varices
 - Blood transfusions may be required if excessive bleeding exists.

Cholecystitis

- Inflammation of gallbladder
- **Most common cause** is stone in the biliary tract.
- **Clinical Manifestation**
 - Right upper quadrant pain mainly after the ingestion of fatty food
 - Acute pain, tenderness and rigidity over Right Upper Quadrant associated with mid-sternal and right shoulder pain.
 - **Positive Murphy's sign:** Patient can't take deep breath when examiner's hand passes below the hepatic margin because of the pain (painful inspiration).
- Chronic cholecystitis occurs because of the inefficient emptying of gallbladder and gallbladder muscle wall disease
- Acalculous cholecystitis occurs in the absence of gallstone disease and is caused by bacterial invasion via lymphatic and vascular system.
- Dark orange and foamy urine
- Steatorrhea, clay colored stool and pruritus.
- **Management**
 - Anticholinergic to decrease the spasm of the bile duct
 - Analgesics for pain control
 - Gallbladder and gallstones are surgically removed if pain persists.
 - Cholecystectomy is the surgical procedure performed to remove gallbladder.
 - **Choledocholithotomy:** Requires incision in the common bile duct to remove stone.

Cholelithiasis

- Calculi or stones are formed in the gallbladder from the solid constituents of the bile.
- **There are two types of stones:**
 - **Pigment stone:** Unconjugated pigment in the bile precipitate to form stone. It can't be dissolved. Surgical removal is the treatment of choice.

- **Cholesterol stone:** Cholesterol is a natural component of bile. Its solubility depends upon bile acid and lecithin. Cholesterol precipitates to form stones when bile acid synthesis is less than cholesterol synthesis.
- **Signs and symptoms**
 - Pain in the right upper quadrant, radiating to back and right shoulder (biliary colic).
 - Obstructive jaundice
 - Color of the urine becomes dark and **stool becomes clay colored.**
 - Bleeding manifestation
- **Investigation**
 - **Abdominal X-ray:** USG, cholescintigraphy, cholecystography, ERCP and percutaneous transhepatic cholangiography
- **Management**
 - **Ursodeoxycholic acid (UDCA)** and **chenodeoxycholic acid (CDCA)** to dissolve cholesterol stones.
 - **Dissolving gall stones:** Solvent such as **mono-octanol or methyl tertiary butyl ether** is infused into gallbladder through a catheter.
 - **Stone removal by instrumentation:** A catheter and an instrument with basket threaded through T-tube, or through a fistula is created and stones are removed.
 - **Extracorporeal shock wave lithotripsy:** Non-invasive procedure
 - **Intracorporeal shock wave lithotripsy:** Under fluoroscopy, laser pulse is directed towards gallbladder and stones are fragmented.
 - **Laparoscopic cholecystectomy:** Removal of gallbladder through a small incision in the umbilicus
 - **Cholecystectomy:** Gallbladder is removed via an abdominal incision
 - **Choledochostomy:** Incision in the common bile duct to remove stone

Pancreatitis

- Inflammation of pancreas. It is often described as auto digestion of pancreas.
- **Causes**
 - **More common:** Obstruction of biliary tract, long-term alcohol use.
 - **Less common:** Viral or bacterial infections.
- **Types**
 - **Acute pancreatitis**
 - It occurs suddenly as one attack or recurrent with resolutions.
 - Sudden onset of abdominal pain or left upper quadrant pain radiating to the back.
 - **Pain is aggravated by alcohol or a fatty meal**



Key Points

- Low fat diet is recommended for the patients of cholelithiasis.
- **Pain in the right upper quadrant** of the abdomen which is radiating to back and right shoulder suggestive of **cholecystitis.**
- **Murphy's sign** → acute cholecystitis



Recent Question (NORCET 2020)

- 15. Murphy's sign is seen in which of the following disease condition?**
- Liver abscess
 - Splenomegaly
 - Peritonitis
 - Acute cholecystitis

Ans. (d) Acute cholecystitis



Recent Questions (CNCI 2021)

- 16. Which maneuver is done to temporarily stop inadvertent bleeding during cholecystectomy**
- Patey
 - Pringle
 - Kocher
 - Billroth

Ans. (b) Pringle

Explanation: The Pringle maneuver is one technique that enables surgeons to halt hemorrhage and find the source of bleeding, allowing time for repair of the vessel.

- 17. After Cholecystectomy, there was 50 mL bile output from the drain on the first postoperative day management is _____**

- Intrabiliary stent
- Immediate exploration
- T-tube drainage
- Observation

Ans. (d) Observation

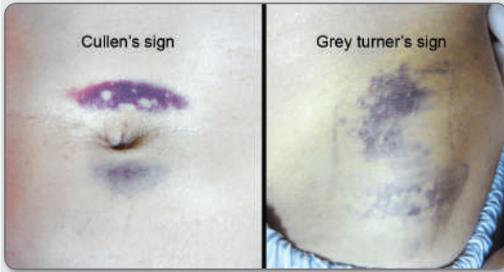




- Abdominal tenderness, guarding, decreased bowel sounds, elevated WBCs, glucose, bilirubin, alkaline phosphatase, and urinary amylase.
- Elevated **serum amylase and lipase level** are seen.
- **Chronic pancreatitis**
 - It's continuous inflammation and destruction of pancreas with scar tissue replacing the pancreatic tissue.
 - Abdominal pain and tenderness, steatorrhea, weight loss, sign and symptoms of diabetes mellitus.
- **Diagnosis**
 - Increased pancreatic hormones such as serum amylase, lipase, glucose and bilirubin.
 - Increase in the count of white blood cells because of infection.
 - Cullen's sign and Grey Turner's sign are the characteristics of this condition.

Cullen's Sign and Turner's Sign

- **Cullen's sign** is superficial edema and bruising in the subcutaneous fatty tissue around the umbilicus. It is a sign of intraperitoneal hemorrhage. It is also a sign of rupture of fallopian tube or ectopic pregnancy.
 - **Grey Turner's sign** refers to bruising of the flanks, the part of the body between the last rib and the top of the hip. It is a sign of retroperitoneal hemorrhage, or bleeding behind the peritoneum.
- Grey turner's sign (flank ecchymosis)** may also be seen in rupture of aneurysm.



- **Signs and symptoms**
 - Severe epigastric pain that worsens after meals
 - Fever and malaise
 - Bulky, fatty and foul-smelling stool
 - Abdominal tenderness and distension.

- **Management**
 - Limit fat and protein intake, avoid alcohol, and heavy meals.
 - **Acute Pancreatitis: NPO; Total Parenteral Nutrition (TPN)**
 - Administer pancreatic enzyme as prescribed to aid in digestion
 - **Surgical Interventions:**
 - **Pancreaticojejunostomy:** Anastomosis of pancreatic duct to jejunum.
 - **Whipple resection** (Pancreaticoduodenectomy)
 - ▶ The head of the pancreas, the first part of the small intestine (duodenum), the gallbladder and the bile duct will be removed. The remaining organs are reattached to allow digestion of food normally after surgery.

Wilson's Disease

- It is a disorder of copper metabolism
- Characterized by deposition of Copper in liver, brain and other tissues (known as Hepatolenticular degeneration)
- Copper gets deposited in basal ganglia leading to tremors, chorea, dystonia and rigidity
- **Kayser - Fleischer ring** (brownish color ring on sclera-corneal junction of eye) and **sunflower cataract** are seen in this condition.
- **Management:**
 - Lifelong zinc and penicillamine/trientine
 - Ammonium tetrathiomolybdate is a chelating drug used as initial treatment

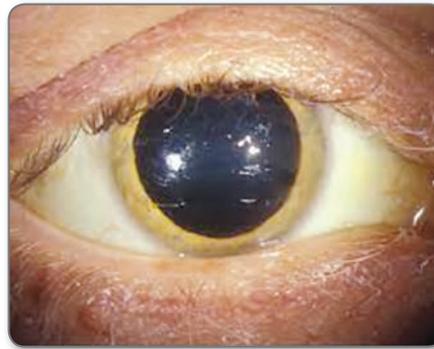


Figure 37 ■ Kayser–Fleischer ring



Key Points

- **Morphine** causes spasm of **Sphincter of oddi** so it is **contraindicated** in patients with **cholecystitis** and **pancreatitis**.
- Elevated serums amylase and lipase are suggestive of pancreatitis.
- **Cullen's sign** is discoloration of abdomen and periumbilical area visible in pancreatitis.
- **Turner's sign** is bluish discoloration of the flank visible in pancreatitis.



Recent Question (CNCI 2021)

18. The following anastomosis are done in Whipple procedure except _____?

- a. Hepatico-jejunostomy
- b. Pancreato-gastrojejunostomy
- c. Gastro-jejunostomy
- d. Jejunostomy

Ans. (d) Jejunostomy



“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



CLINICAL CASE-BASED QUESTIONS

(Including All Topics)

IMMUNE SYSTEM

#1

An adult client with HIV infection has been given a treatment with efavirenz. The Nurse expects this drug to be given along with emtricitabine and tenofovir as a combination (Atripla). The reason for administering this combination is to

- Prevent development of psychiatric comorbidities.
- Avoid dizziness, sedation, and nightmares.
- Reduce viral resistance.
- Control severe rash and hepatotoxicity.

Ans. (c) Reduce viral resistance

Explanation: ATRIPLA is a fixed-dose combination tablet containing efavirenz, emtricitabine, and tenofovir. The actual reason for using combination products is to reduce **viral resistance**. Atripla is **NOT** approved for the treatment of chronic hepatitis B virus (HBV) infection.

DIGESTIVE SYSTEM

#2

A 35-year-old male patient complains of abdominal discomfort and bloating. On examination, the nurse found leakage of watery stool from his rectum. The nurse is aware that this could be a possible sign of

- Intussusception
- Bowel incontinence
- Fecal impaction
- Constipation

Ans. (c) Fecal impaction

Explanation: Fecal impaction is a severe bowel condition in which a hard, dry mass of stool gets stuck in the colon or rectum. Fecal impaction can be serious. Fecal impaction can cause a range of symptoms, which include liquid stool leaking from the rectum, pain or discomfort in the abdomen, nausea or vomiting, abdominal bloating and feeling of a need to push.

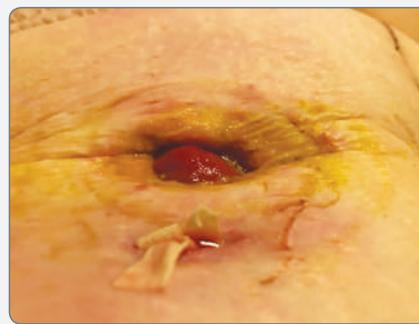
#3

A patient is diagnosed with Crohn's disease and colostomy was performed as an intervention. While assessing the new stoma, the nurse suspects that the stoma has retracted. Which of the following findings by the nurse would suggest that the stoma has retracted?

- Narrowed and flattened stoma
- Stoma appears pinkish red and moist
- Concave and bowl-shaped stoma
- Stoma appears reddish purple and dry

Ans. (c) Concave and bowl-shaped stoma

Explanation: A retracted stoma has a concave, bowl-shaped appearance. Retraction causes a poor pouching surface, leading to frequent peristomal skin complications. A healthy stoma is pinkish-red and moist. A narrowed or constricted or flattened stoma is a sign of stenosis. Narrowing of the stoma is a late complication of a stoma. A dry and reddish-purple stoma indicates ischemia.



#4

Nurse Ramya is preparing a 45-year-old male client for gastrectomy surgery. The patient apprehensively asked the nurse about the possible complications of gastrectomy. Which of the following responses by the nurse is appropriate?

- Dumping syndrome
- Clay-colored stool
- Ribbon like stool
- Jaundice

Ans. (a) Dumping syndrome

Explanation: In **Dumping syndrome**, the stomach empties its contents into the small intestine (duodenum) faster than normal. **Dumping syndrome** is also known as rapid gastric emptying. The sudden influx of food into the intestine causes a lot of fluid to move from bloodstream into intestine. This extra fluid causes diarrhea and bloating.

#5

A 45-year-old patient with frequent GI disturbances is apprehensive about developing a colorectal cancer. He approached a nurse regarding dietary recommendation. Which of the following dietary recommendations is recommended to reduce the risk of developing colon cancer?

- Take low-fiber and low-residual foods regularly
- Avoid whole grain in the diet
- Add more green vegetables such as broccoli and cauliflower in the diet.
- Take diet which is high in red meat



Ans. (c) Add more green vegetables such as broccoli and cauliflower in the diet.

Explanation: High-fiber diets that include lots of vegetables, fruits, and whole grains have been linked with a decreased risk of colon or rectal cancer. Increased consumption of red meat (lamb, beef and pork) is associated with risk of colorectal cancer.

#6

Mr. Raj Kumar is a chronic alcoholic who comes to the outpatient department with complaints of weakness and anorexia. His physical assessment shows abdominal distention, dull pain in the right upper quadrant, pale conjunctiva, and hepatomegaly. The nurse understands which of the following tests is not required for Mr. Raj Kumar?

- Ultrasonography
- Biopsy
- Blood biochemistry
- Colonoscopy

Ans. (d) Colonoscopy

Explanation: The patient shows the clinical features related to liver disease, hence to confirm the condition USG, Biopsy and Blood testing are relevant, whereas the colonoscopy is not relevant to diagnose the liver condition rather it is used to rule out the problems related to the large intestine.

#6A

The patient was diagnosed with Stage II liver cancer. The priority nursing diagnosis for this patient is

- Fluid volume excess
- Imbalanced nutrition
- Impaired skin integrity
- Disturbed body image

Ans. (b) Imbalanced nutrition

Explanation: A client with this condition is not able to digest and process the food materials and absorb the nutrient, hence he/she experiences weight loss and poor muscle tone. Thus, the priority nursing care plan should be focused on imbalanced nutrition which is less than the body requirements.

#7

Mr. Ruma, 27-year-old, has fever and pain in the right upper quadrant that increases on eating fatty food and anorexia. She is recently diagnosed with cholelithiasis on abdominal ultrasound. The nurse explains to the patient food which she should avoid taking, is

- Potato
- Rice
- Bread
- Cheese

Ans. (d) Cheese

Explanation: The patients with cholelithiasis are advised not to take food with high fat content such as dairy products like butter, cheese and ghee and should avoid fried foods. Because these fatty foods will further worsen the condition and result in severe pain to the patient. Other listed food items are appropriate for the client to consume.

ENDOCRINE SYSTEM

#8

A male patient is admitted with Addison's disease. Laboratory test report reveals low aldosterone. The patient is on high doses of corticosteroids. The nurse is planning for a health teaching on dietary modifications. The nurse is aware that the following dietary modifications is NOT recommended for this patient.

- High carbohydrate diet
- Calcium rich food
- Food rich in vitamin-D
- Sodium restricted diet

Ans. (d) Sodium restricted diet

Explanation: Sodium should not be restricted in patient with low aldosterone levels. A patient with Addison's disease (adrenal insufficiency) needs to take adequate sodium to prevent excess fluid loss and to maintain electrolyte balance. High doses of corticosteroids are linked to a higher risk of osteoporosis, so calcium and vitamin-D rich diet is recommended. The patient should be instructed to have diet rich in complex carbohydrates and protein.

GENITOURINARY SYSTEM

#9

A 58-year-old male patient with Chronic Renal Failure (CRF) is on hemodialysis. He is advised to do peritoneal dialysis at home. While teaching the patient about how to perform peritoneal dialysis, the nurse instructs to warm the dialyzing solution to 37°C. The primary reason behind warming the dialyzing solution is to

- Remove the waste materials from body cells
- Relax the abdominal muscles
- Dilate peritoneal blood vessels
- Maintain a constant body temperature

Ans. (c) Dilate peritoneal blood vessels

Explanation: Warming the dialyzing solution to 37°C helps in the dilation of peritoneal blood vessels, which improves the rate of urea clearance. Warmed solution also helps in prevention of cold sensations and maintains body temperature, however, the primary reason is to dilate peritoneal blood vessels.

INTEGUMENTARY SYSTEM

#10

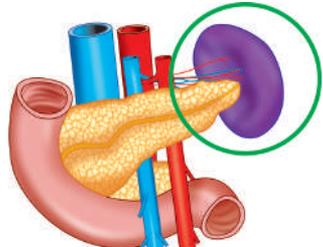
A 60-year-old female patient who is admitted for more than two weeks in Intensive Care Unit has developed a pressure ulcer on the sacral region. The nurse assessed the site of pressure ulcer and observed that the wound extends through the dermis into fatty subcutaneous tissue but the bone and tendons are not visible. Which of the following stages will the nurse assign this pressure ulcer?

- Stage-I
- Stage-II
- Stage-III
- Stage-IV


Ans.

33. b
34. d
35. b
36. d
37. d
38. b
39. d
40. a

33. Removal of organ (encircled) shown in photograph mostly leads to _____ infection. [Recent Question 2014]



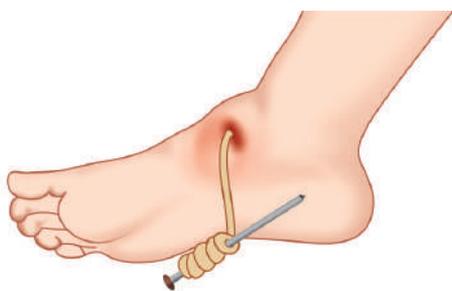
- a. Streptococcus b. Pneumococcus
c. E. coli d. Salmonella

37. Kit shown in photograph is used for diagnosis of:



- a. Kala-azar b. Malaria
c. Lymphatic filariasis d. Dengue

34. Identify the worm shown in the photograph:



- a. Round worm b. Hook worm
c. Tape worm d. Guinea worm

38. Mask shown in photograph was used for prevention of:



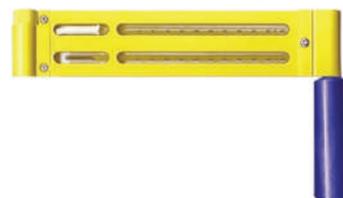
- a. Tuberculosis b. Swine flu
c. SARS d. Pneumonia

35. Type of venom produced by snake shown in photograph is:



- a. Myotoxic b. Neurotoxic
c. Hemolytic d. Proteolytic

39. Instrument shown in photograph is used to assess: [Recent Question 2016]



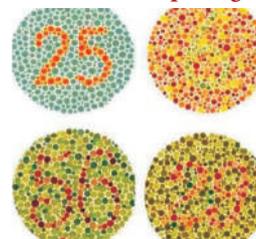
- a. Environmental heat measurement
b. Cooling power of air
c. Mean radiant temperature of surroundings
d. Relative humidity of air

36. Type of venom produced by snake shown in photograph is:



- a. Myotoxic b. Neurotoxic
c. Hemolytic d. Proteolytic

40. Test of color vision shown in photograph is known as:



- a. Ishihara plates
b. Edridge Green lantern test
c. Farnsworth-Munsell 100 hue test
d. Nagel's anomaloscope

41. Identify the paranasal sinus being tested by technique as shown in photograph:



- a. Frontal sinus
b. Maxillary sinus
c. Ethmoid sinus
d. Sphenoid sinus

45. Identify the instrument shown in the photograph:

[Recent Question 2017]



- a. Siegel's pneumatic speculum
b. Pilcher's nasal speculum
c. Thudicum nasal speculum
d. Killian's nasal speculum

42. Identify the instrument shown in the photograph:

[Recent Question 2016]



- a. Hazek's punch forceps
b. Irwin Moore's forceps
c. Asch's septum forceps
d. Luc's forceps

46. Identify the instrument shown in the photograph:



- a. Foley's catheter
b. Nasogastric tube
c. Malecot catheter
d. Stomach tube

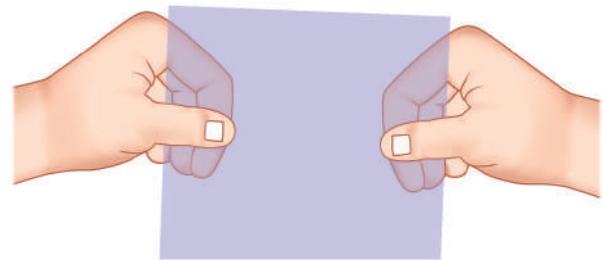
43. Identify instrument shown in photograph:



- a. Freer's elevator
b. Denis Browne Tonsil holding forceps
c. Doyen's mouth gag
d. Hagen's Cheek retractor

47. Nerve tested by using clinical test shown in photograph:

[Recent Question 2013]



- a. Median nerve
b. Radial nerve
c. Axillary nerve
d. Ulnar nerve

44. Identify the instrument shown in the photograph:

[Recent Question 2014]



- a. Siegel's pneumatic speculum
b. Vienna nasal speculum
c. Thudicum nasal speculum
d. Beckmann nasal speculum

48. Identify the instrument shown in photograph, used during general anesthesia:

[Recent Question 2016]



- a. Laryngoscope
b. Endotracheal tube
c. Laryngeal mask airway
d. Fibro-optic laryngoscope

Ans.

41. c
42. d
43. c
44. b
45. d
46. d
47. d
48. d



“One day in perfect health is much.”

—Arabic

FUNDAMENTALS OF NURSING



SYNOPSIS

INTRODUCTION TO NURSING

Definition

The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible (Virginia Henderson).

Scope of Nursing

- Promoting health and wellness
- Preventing illness
- Restoring health
- Facilitating coping with disability and death

Current Trends in Nursing

- Shortage of nursing professionals
- Evidence-based practice
- Community-based nursing
- Decreased length of hospital stay
- Aging population
- Increase in chronic condition
- Independent nursing practice

Roles of a Nurse

- Caregiver
- Teacher
- Communicator
- Patient advocate
- Counselor
- Change agent
- Leader
- Researcher
- Collaborator

Expanded Educational and Career Roles of Nurses

- Clinical nurse specialist

- Nurse-practitioner
- Nurse-midwife
- Nurse-educator
- Nurse-administrator
- Nurse-researcher
- Nurse-entrepreneur

HISTORY OF NURSING

Florence Nightingale

- Florence Nightingale, also known as “the Lady with the Lamp,” was a philosopher and founder of Modern Nursing.
- She was born in Florence, Italy on May 12, 1820 and died on August 13, 1910.
- Every year, International Nurses Day is celebrated on 12th May.

Nursing in India

- In 1887, the first school of nursing was started in Government General Hospital, Madras (now Chennai) with 6 months Diploma in Midwives’ Program.
- In 1926, Madras state (now Tamil Nadu) formed first registration council to provide basic standards in education and training.
- In 1908, Trained Nurses Association of India (TNAI) was formed.
- In 1946, the first four years’ bachelor’s degree program was established at RAK College of Nursing in Delhi and Christian Medical College, Vellore.
- The Indian Nursing Council Act was passed by ordinance on December 31, 1947.
- Nursing Council Act came into existence in 1948 to constitute a council of nurses.
- In 1960, the first master’s degree course, a two-year postgraduate program, was started at the RAK College of Nursing, Delhi.



Key Point

Principles of Nursing: Safety, therapeutic effectiveness, comfort, resource utilization and good workmanship



Key Points

- **Florence Nightingale** defined Nursing as “**the art of utilizing the environment of patients to assist them in their recovery.**”
 - **Environment** is the focus of nursing care in Nightingale’s theory.
 - A profession requires an extended education/training of its members as well as a basic foundation.
- Characteristics of a profession:**
- Profession has a theoretical body of knowledge leading to defined skills and abilities
 - A profession provides a specific service



Techniques of Physical Examination

- **Inspection:** It means observing the patient properly and collecting information regarding his health status.
- **Palpation:** The act of feeling with the hand; application of the fingers with light pressure on the surface of the body for the purpose of determining

the conditions of the parts beneath. Bimanual palpation refers to palpation with both hands.

- **Percussion:** Tapping any part of the body and assessing the sound produced to collect information.
- **Auscultation:** Listening to different body sounds using instruments such as stethoscope.



Key Points

- The type of assessment that includes data related to a patient's biological, cultural, spiritual and social need is called **Comprehensive Assessment**.
- **Screening** is a process for evaluating the possible presence of a particular problem. The outcome is normally a simple YES or NO.

Also Know

Assessing Vital Signs

- Before the thermometer is used for another patient, it should be disinfected with 1:40 strength of Dettol or 1:20 strength of Savlon (most preferred and best solution) for 5 minutes and with Lysol and carbolic with 1:40 for 3 minutes. (For mercury glass thermometer)
- Rectal method is the most reliable method for taking temperature.
- If the patient has just had a very hot or cold drink, wait 10–20 minutes before taking the temperature.
- The most accurate assessment of pulse rate is apical pulse, and for measurement, stethoscope is required.
- A weak thready pulse with a significant fall in blood pressure may indicate circulatory failure.

Instruments used for Physical Examination

Table 1: Instruments used for physical examination

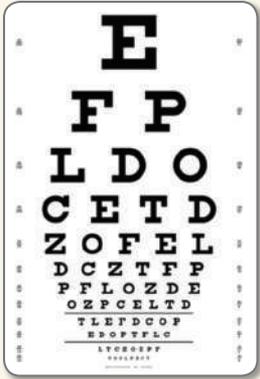
Instruments	Purpose	Pictures of the instrument
Ophthalmoscope	Examining the eyes	
Otoscope	Examining ear	
Stethoscope	Auscultation (Listening to body sounds)	



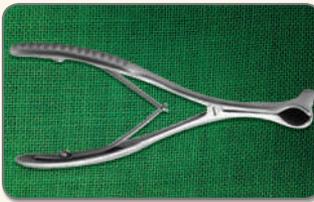
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Instruments	Purpose	Pictures of the instrument
Sphygmomanometer	To measure BP	
Thermometer	To measure the body temperature	
Urinometer	To measure the specific gravity of urine	
Glucometer	To measure the blood glucose level	
Snellen chart	To measure the visual acuity	

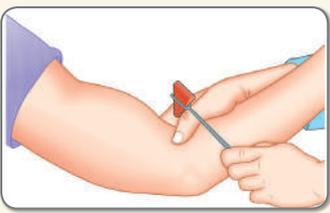


Instruments	Purpose	Pictures of the instrument
Tongue depressor	To examine the oral cavity, by suppressing the tongue	
Laryngoscope	To visualize larynx	
Nasal speculum	To examine the nasal cavity	
Percussion hammer	To check the reflexes	

Reflexes



Table 2: Reflexes and responses

Name of the reflex	Response	Picture of procedure
Biceps reflex	Tapping of biceps tendon causes contraction of muscle.	
Triceps reflex	Tapping over olecranon process causes straightening of upper arm.	





Name of the reflex	Response	Picture of procedure
Patellar reflex	Tapping just below the knee (patella) causes forward kicking movement of leg.	
Achilles reflex	Tapping over the Achilles tendon causes downward jerky movement.	
Plantar reflex (Babinski reflex)	Stroking over the sole causes toe to bend downward, it is negative Babinski and is normal for adult. But in children, stroking over the sole causes toe to move upward and outward, that is called as positive Babinski and is normal for children up to 2 years of age. Positive Babinski is considered as abnormal for adults.	

Romberg's Test/Romberg's Sign (for Balance)

In this test, ask the person to stand with feet together and eyes closed. If the patient is able to maintain the equilibrium, then test is normal. But if the person falls down, then Romberg's test is positive which means patient has balancing problem.

TYPES OF NURSING MODALITIES

Primary Nursing

- Each nurse is assigned to a small group of patients.
- The nurse assumes 24-hour responsibility for each patient's total care continuously until discharge (even when the nurse is technically off duty).
- She may be assisted by an associate nurse, but the primary nurse is contacted if needed.
- **Common use areas:** Hospice care and home health.

Note

Ensuring patient safety is the most important nursing intervention during Romberg's test. The nurse should stand close to the patient to prevent potential injury if the patient were to fall.

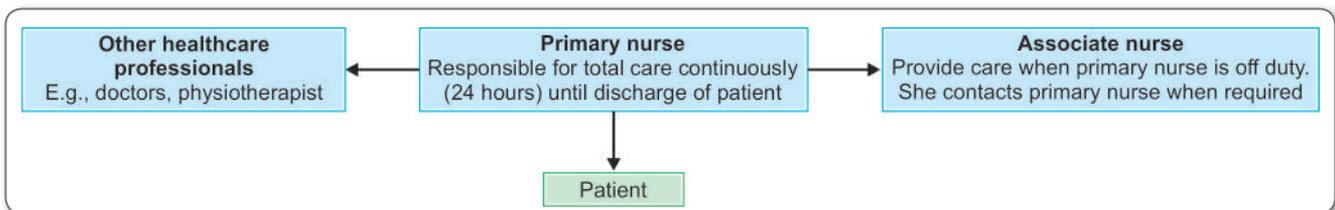


Figure 2 ■ Primary nursing structure





Team Nursing

- A Head Nurse or Nurse Manager supervises and coordinates a team of nurses.
- The Nurse Manager assigns a group of patients to an individual nurse [Registered Nurse (RN)].
- Each nurse is responsible for most of the each patient's care. Some of the duties are assigned to other nurses or nursing assistants.
- Includes nurses at all levels of knowledge, i.e., Registered Nurses, Practical Nurses and Nursing Assistants.



Key Point

- The team nursing model is similar to the functional nursing method, but provides care on a larger scale.

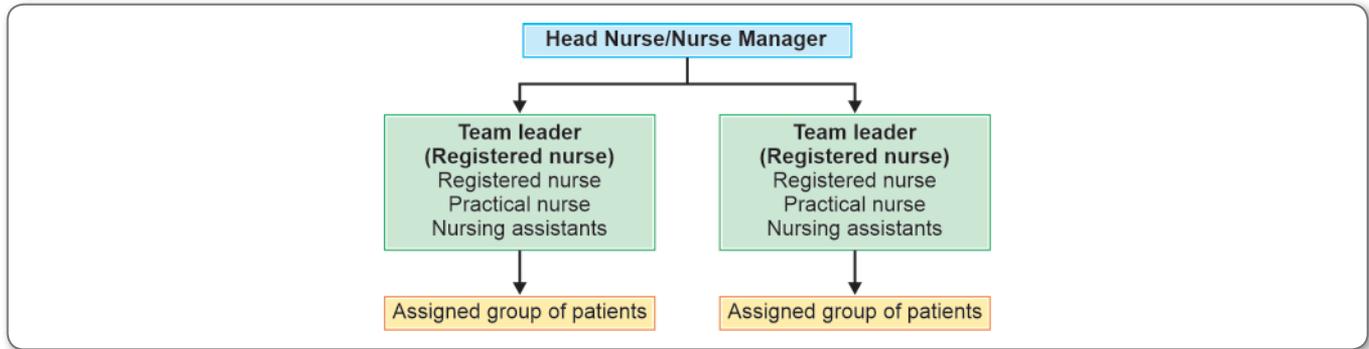


Figure 3 ■ Structure of team nursing

Modular Nursing

- It is a modification of team nursing.
- Patient unit is divided into modules (geographical area/unit) with an RN as team leader.
- The same team of caregivers is consistently assigned to same geographic area.

Functional Nursing

- Nurses are assigned a specific task and do only that duty.
- The nurse performs a particular task for every patient in the ward. For example, Medication Nurse, Dressing Nurse, IV Nurse, etc.
- Common use area: Operation theater.

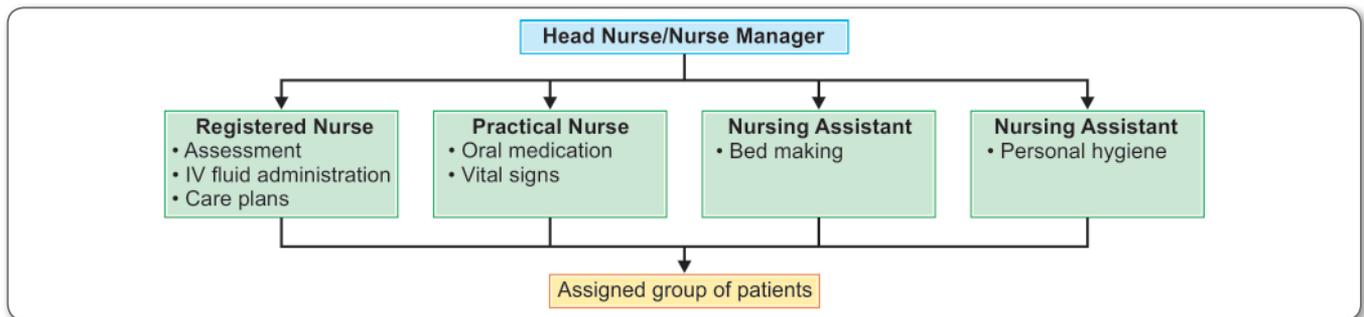


Figure 4 ■ Structure of functional nursing

Nursing Case Management

- Role of nurse is a case manager.
- A Registered Nurse as case manager advocates, manages and coordinates care for patients.
- Applicable in clinics, hospitals and in community.

Private Duty Nursing

The nurse is responsible for the total care of one individual patient generally at home.

MEDICAL AND SURGICAL ASEPSIS-TERMINOLOGIES

- **Asepsis:** Free from infection.
- **Medical asepsis:** Reduction in number of disease causing agents and their spread.
- **Surgical asepsis:** Complete elimination of disease causing agents.
- **Antiseptic:** The substances that are applied to living tissue or skin to reduce the possibility of infection, sepsis or putrefaction.

Practice Question

5. Collaboration in providing care to a group of patients under the supervision of a professional nurse is referred as
- Primary Nursing
 - Case method
 - Team nursing
 - Modular nursing
- Ans. (c) Team nursing**



“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



CLINICAL CASE-BASED QUESTIONS

#1

Raghav is working in critical care area as Registered Nurse. He was providing bed bath to his client. While cleaning the lower extremities he uses long, firm strokes from the distal to the proximal areas. This is because:

- To increase the range of motion in the extremities and to prevent foot drop
- Proximal area is cleaner than the distal area of the extremities
- To increase venous return and to prevent venous stasis
- To assess the skin integrity

Ans. (c) **To increase venous return and to prevent venous stasis**

Explanation: Wash the lower limbs from distal to proximal with long, gentle strokes. Washing from distal to proximal may help to promote venous return. In massage, effleurage is a technique in which the masseur's hand is moved from distal to proximal limb so that it enhance the venous return and lymphatic flow.

#2

Nurse Sheela is caring a patient who has difficulty in falling asleep. She is aware that the following interventions help the patient to fall asleep; EXCEPT:

- Provide a warm glass of milk before the bed time
- Turn on quiet music in patient's room
- Provide back massage to the client
- Encourage short nap after lunch.

Ans. (d) **Encourage short nap after lunch.**

Explanation: It is normal to feel a little sleepy after eating lunch. However, sleeping after lunch may lead to difficulty in falling asleep in the night. Warm glass of milk before the bedtime, listening to quiet music of patient's choice and back massage promotes sleep.

#3

Nurse is caring for client with a communicable disease. While providing isolation to the client which among the following characteristic is most important for the nurse to know?

- Causative agent and mode of transmission
- Causative agent and treatment options
- Immune power of the host
- Diagnostic methods available

Ans. (a) **Causative agent and mode of transmission**

Explanation: Knowledge regarding causative agent and its mode of transmission is most important in deciding isolation method/ technique for the infected client. The use of type of PPE (gown/glove/

mask) depends on the mode of transmission. For example, wearing mask is necessary if the mode of transmission is droplet. Gown and glove are essential if the mode of transmission is direct contact. Immune power of the host and diagnostic methods are not relevant here as the patient is already infected and is diagnosed. Treatment options does not influence the decision of isolation method.

#4

Nurse Shalini is educating her client regarding the collection of sputum for culture and sensitivity. Which among the following statement by the client indicates that teaching was effective?

- Collect sputum in a wide-opened mouth sterile container
- Collect sputum in the morning after rinsing with mouthwash
- Collect sputum in a plastic container and cover it with plastic wrap to prevent contamination
- Collect sputum at bed time after taking prescribed medications

Ans. (a) **Collect sputum in a wide-opened mouth sterile container**

Explanation: The best quality sample is usually obtained early in the morning upon rising. Mouth should be rinsed out with water or saline prior to collection (not with mouthwash). Food should not be ingested for 1–2 hours prior to collection. It is very important that the sputum is the material coughed up from the lungs, and not saliva “spit”. For culture and sensitivity, the sputum must be collected in a sterile container. Collection of sputum at bed-time after taking medications is not recommended.

#5

A client with IV line in situ for the last 72 hours complaining of swelling and pallor at the site. These signs indicate:

- Phlebitis
- Infection
- Infiltration
- Dislodgement

Ans. (c) **Infiltration**

Explanation: Infiltration is a complication IV line. When IV fluids or medications leak into the surrounding tissue it is known as infiltration. It is caused by improper placement or dislodgment of the catheter. Manifestations include redness around the site, swelling, puffy or hard skin around the site, blanching (lighter skin around the IV site), pain or tenderness around the site, IV not working, cool skin temperature around the IV site or of the scalp, hand, arm, leg or foot near the site.

#6

Nurse Ramya is preparing Inj. Augmentin to administer. While diluting this medicine, to ensure complete dilution nurse should:

- Warm the diluents
- Shake medicine vial vigorously
- Roll the vial between the palm
- After adding diluents keep the vial as it is

Ans. (c) Roll the vial between the palm

Explanation: After reconstituting powdered form of medication with saline or water for reconstitution it should be rolled between palms. It should not be shaken vigorously.

#7

Nurse is preparing inj. Insulin for her client. Which among the following statement is correct?

- Two types of insulin should not be mixed
- Draw up regular insulin, then NPH insulin
- Draw up long-acting insulin then short acting insulin
- Use two separate syringe to administer different types of insulin

Ans. (b) Draw up regular insulin, then NPH insulin

Explanation: When you mix regular insulin with another type of insulin, always draw the regular insulin into the syringe first. NPH (neutral protamine hagedorn) is an intermediate-acting insulin. The rapid- or short-acting insulin (clear) is drawn up first to prevent the intermediate-acting insulin (cloudy) from getting into the rapid- or short-acting insulin bottle and affecting the onset, peak, and duration.

#8

Nurse Liza is performing abdominal assessment for a client with complaint of abdominal pain. Which among the following is correct?

- Assess the quadrant of abdomen with pain first
- Assess the quadrant of abdomen with pain at the last
- Perform abdominal quadrant assessment from left to right
- Any area of the abdomen can be assessed as per the convenience of nurse

Ans. (b) Assess the quadrant of abdomen with pain at the last

Explanation: While performing abdominal examination, the nurse should systematically assess all areas of the abdomen. The symptomatic area of the abdomen should be examined at last. If symptomatic quadrant palpated first, it will elicit pain in the symptomatic area, causing the muscles in other areas to tighten. This would interfere with further assessment.

#9

While collecting history from a client admitted in the emergency department, which among the following reported by the client is considered as subjective data?

- Weakness
- Icterus
- Hemoptysis
- Melena

Ans. (a) Weakness

Explanation: Subjective data are the symptoms which felt by the patient and others can't be seen such as weakness, tiredness, etc. All other options are objective data or sign which others can also observe. It includes icterus, melena, hemoptysis, etc

#10

Which among the following statement is wrong regarding transferring a patient from bed to chair?

- Place the patient flat on the bed
- Helps the patient to sit on the edge of the bed with legs dangling
- Nurses need to stand by facing the patient
- Place the chair by facing the head of the bed

Ans. (a) Place the patient flat on the bed

Explanation: Except option A, all others are the step involved in transferring patient from bed to chair or wheel chair.

#11

Asthmatic patient is getting discharged from the respiratory unit. Nurse has given health education to the client regarding asthma and its management. After teaching the client, nurse asks the client to repeat the instructions. Which of the following professional role is performed by the nurse?

- Advocate
- Educator
- Adviser
- Manager

Ans. (b) Educator

Explanation: While educating a client about his or her own disease and its management, nurse performs the role of an educator.

#12

Which among the following is the responsibility of a scrub nurse in the operation theatre?

- Verify the informed consent
- Assist the surgeon in gowning and gloving
- Receiving the patient
- Maintain the count of instruments used

Ans. (d) Maintain the count of instruments used

Explanation: In the operating room, maintaining the count of instruments is the responsibility of scrub nurse. All the other given options are the responsibilities of circulatory nurse.

#13

Nurse Kavita in the general ward is preparing occupied bed. Identify the incorrect statement regarding occupied bed:

- Roll the patient to far side of the bed
- Tuck the top sheet and blanket at the bottom of the bed
- Ask the patient to sit on a chair beside the bed
- Place pillow at the head end of the bed

Ans. (c) Ask the patient to sit on a chair beside the bed

Explanation: Occupied bed is a bed prepared with a patient in it, the one who cannot get out of the bed. Except option c, all other options are incorrect regarding occupied bed.





#14

Nurse Ramya is advised to provide continuous enteral feed to his client. Which among the following action by nurse indicate lack of knowledge in this area?

- Providing fowlers position to the client
- Administering feeds at room temperature
- Maintain prescribed flow rate
- Hang the enteral feed for one day

Ans. (d) Hang the enteral feed for one day

Explanation: Continuous enteral nutrition: gravity administered or by feeding pump continuously for 12 hrs/day or more. Except option d, all other options are correct related to continuous enteral feed.

#15

Nurse Janet is educating a client regarding sublingual medication administration. Which statement by the client indicates need for further teaching?

- These are the medications administered on the floor of the mouth
- These medications are absorbed directly into blood stream from the oral mucosa
- These medications bypass the GI and hepatic system
- These are the medications administered on top of the tongue

Ans. (d) These are the medications administered on top of the tongue

Explanation: Sublingual administration means medications are administered under the tongue to dissolve and for easy and early absorption. They are not administered on the top of the tongue.

#16

Nurse Jisha is caring for a client in postoperative unit with Jackson-Pratt wound drain in situ. Which of the following action performed by nurse Jisha is correct regarding the care of drain site?

- Clean the drain site from inner to outer in circular motion
- Clean the drain site from outer to inner with a linear stroke
- Remove the drain and clean the site
- Wear all PPE while providing drain site care

Ans. (a) Clean the drain site from inner to outer in circular motion

Explanation: Drain site is considered as clean and the site has to be cleaned from inner to outer (more clean to less clean area) using circular strokes. Cleaning from outer to inner and the removal of drain and cleaning the site are also not recommended. While cleaning the drain site, one needs to wear sterile gloves rather than PPE.

#17

Which among the following nursing diagnosis is most important while caring for a female client with deep vein thrombosis?

- Risk for injury related to increased venous blood flow
- Altered tissue perfusion related to venous congestion
- Fluid volume overload related to edema
- Risk for infection related to altered skin integrity

Ans. (b) Altered tissue perfusion related to venous congestion

Explanation: Deep vein thrombosis leads to decreased tissue perfusion. So most appropriate nursing diagnosis is altered tissue perfusion related to venous congestion.

#18

Nurse John is reviewing his nursing care plan for the assigned client and decided to revise the nursing care plan for his client. In which step of the nursing process revision takes place?

- Assessment
- Planning
- Implementation
- Evaluation

Ans. (d) Evaluation

Explanation: During the evaluation step of the nursing process the nurse determines whether the goals established have been achieved and evaluates the success of the plan. Assessment involves data collection. Planning involves setting priorities, and implementation is the actual intervention.

#19

Nurse Alice working in recovery room received a client following cholecystectomy surgery. Which among the following nursing diagnosis takes highest priority in the immediate post-operative period?

- Impaired skin integrity related to surgical incision
- Fluid volume deficit related to blood loss during surgery
- Risk for aspiration related to general anesthesia
- Acute pain related to surgery

Ans. (c) Risk for aspiration related to general anesthesia

Explanation: In the recovery room nurse is receiving client immediately after surgery. In the immediate post-operative period, airway is the most important priority. So, option c is the correct answer.

#20

Nursing student was taking BP of a client admitted in general ward. Student selected large cuff for the client. What finding should be expected by the instructor?

- Falsely high
- Falsely low
- Correct reading
- It can be high or low

Ans. (b) Falsely low

Explanation: The width of the bladder of the blood pressure cuff should be approximately 40% of the circumference of the upper arm midway between the olecranon and the acromion. The length of the bladder of the cuff should encircle 80–100% of the circumference of the upper arm at the same position.

If the cough is large, it will give falsely low reading and a small cough will give falsely high BP value.

? Image-Based Questions

1. Instruments shown in photograph are best sterilized by:
[Recent Question 2014]



- a. Irradiation
- b. Autoclaving
- c. Hot air oven
- d. Ethylene dioxide

2. Principle on which instrument shown in photograph cause sterilization:



- a. Steam under pressure
- b. Dry heat
- c. Convection current in water molecules
- d. Tyndallization

3. Instrument shown in photograph is used in public health for:



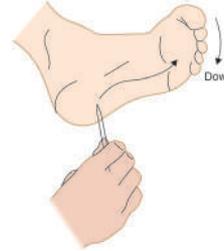
- a. Head circumference
- b. Mid arm circumference
- c. Skin fold thickness
- d. Cold chain temperature monitoring

4. Identify the apparatus used in pediatrics as shown in photograph:



- a. Resuscitator
- b. Nebulizer machine
- c. Irradiance meter
- d. Suction machine

5. The response shown by the adult in the following picture is:



- a. Flexor planter reflex
- b. Babinski reflex
- c. Ankle reflex
- d. Tow reflex

6. The response shown by the adult in the following picture is:



- a. Extensor plantar reflex
- b. Babinski reflex
- c. Both a and b are correct
- d. Flexor plantar reflex

7. The physician is examining the patient's abdomen to diagnose possible _____



- a. Cullen's sign
- b. Ulcerative colitis
- c. Appendicitis
- d. Diverticulitis

8. Name the maneuver:



- a. Semont maneuver
- b. Heimlich maneuver
- c. Epley maneuver
- d. Chock maneuver



Ans.

- 1. c
- 2. b
- 3. c
- 4. b
- 5. a
- 6. c
- 7. c
- 8. b

9. The patient is being assessed for:



- a. Radial pulse b. Femoral pulse
c. Carotid pulse d. Tibial pulse

13. A nurse is assessing the blood pressure of a hypertensive patient as given in the picture. The recorded BP would be:



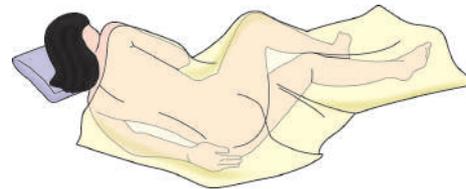
- a. Same as actual BP
b. Higher systolic but lower diastolic
c. Higher systolic and diastolic
d. Lower systolic and diastolic

10. Name the instrument in the following image:



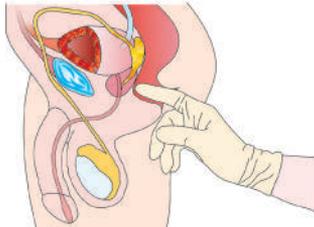
- a. Patient sling b. Patient hoist
c. Recline lift d. Patient Walker

14. Identify the position shown in the photograph:



- a. Trendelenburg position
b. Sim's position
c. Fowler position
d. Lloyd Davis position

11. Name of the examination shown in image is:



- a. Digital rectal Examination
b. Manual rectal Examination
c. Proctoscope
d. Rectoscopy

15. What is this?



- a. Intravenous fluid infusion set
b. Blood set
c. Arterial line
d. CVP line

12. The diameter (size) of shown image starts from:



- a. 4 mm b. 4.5 mm
c. 5 mm d. 5.5 mm

16. Route of drug administration shown in photograph is:



- a. Subcutaneous b. Dermojet
c. Intradermal d. Pellet implant



Ans.

9. c
10. b
11. a
12. c
13. a
14. b
15. b
16. c


Ans.

17. b
18. a
19. a
20. c
21. b
22. b
23. d
24. c

17. Identify the symbol shown in photograph:



- a. Radiation hazard b. Biohazard waste
c. Cytotoxic waste d. Biodegradable waste

21. Identify the instrument shown in photograph:



- a. Hot air oven b. Autoclave
c. Hydroclave d. Microwave

18. Identify the symbol shown in photograph:



- a. Recyclable waste b. Biohazard waste
c. E-waste d. Food waste

22. Identify symbol shown in photograph:



- a. Indian Statistical Institute
b. Indian Standards Institute
c. Indian Seeds Institute
d. Indian Soil Institute

19. Identify the symbol shown in photograph:



- a. Radiation hazard b. Biohazard waste
c. Cytotoxic waste d. Biodegradable waste

23. Identify the test done by instrument shown in the photograph:



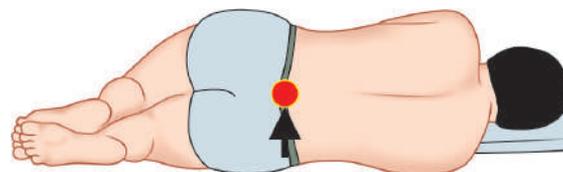
- a. Rinne's test
b. Weber's test
c. Modified Schwabach's test
d. All of the above

20. Identify the symbol shown in photograph:



- a. Radiation hazard b. Biohazard waste
c. Cytotoxic waste d. Biodegradable waste

24. Site (arrow) shown in the photograph is used for:



- a. Pleural fluid aspiration
b. Ascitic tap
c. Lumbar puncture
d. Bone marrow aspiration


Ans.

49. a
50. c
51. c
52. d
53. a
54. b
55. b
56. d
57. a
58. b
59. a
60. b
61. a
62. b

ADMISSION & DISCHARGE PROCEDURE

49. What is the full form of LAMA?

- Leave against medical advice
- Leave and medication advice
- Leave alone with medical application
- Leave against medication apply

Explanation: Option a is the correct full form of LAMA. In this, the patient chooses to leave the hospital before the treating physician recommends discharge.

50. The primary response of a nurse during admission of a client is to:

- Orient the client to hospital routine
- Prepare admission sheet
- Receive the client in a courteous manner
- Fill consent form

51. Following an accident, client is admitted to a healthcare facility. This type of admission is:

- Routine admission
- Therapeutic admission
- Emergency admission
- Accidental admission

52. Discharge planning of the patient begins:

- When the physician orders for discharge
- When patient starts showing positive response to the treatment
- At the time of initiation of treatment
- At admission

53. A patient who decides to leave the hospital against medical advice (LAMA) must sign a form. What is the purpose of this form?

(LNJP HD 2012)

- To release the physician and hospital from legal responsibility for the patient's health status
- To ethically illustrate that the patient has control of his or her own care and treatment
- To use in the event of readmission
- To indicate the patient's wishes

54. Disinfection of patient's unit after the death/discharge of patient is termed as:

- Concurrent disinfection
- Terminal disinfection
- Sterilization
- Quarantine

55. Which of the following nursing actions should be given highest priority when admitting the patient into the operating room?

(ESIC Chennai May 2012)

- Level of consciousness
- Patient identification and correct operative consent
- Positioning and skin preparation
- Vital signs

NURSING PROCESS

56. ____ is a tool of Nursing Process: (Safdarjung NO 2018)

- Personal history
- Present illness
- Socioeconomic status
- Planning

Explanation:

- The tools of nursing process include Assessment, Nursing diagnosis, Planning, Intervention and Evaluation.
- Planning** is establishing priorities of care and is an important tool or element of nursing process. It is a base for implementation.

57. Nursing care that is based on identifying and meeting the needs of a patient is called: (AIIMS BPL NO 2018)

- Client-oriented
- Prioritization
- Goal-oriented
- Target realization

Explanation: Client-oriented approach or patient-centered care means that the nursing care is based on assessing and meeting the needs of the client as per the nursing process.

58. Which of the following statements is true about nursing diagnosis? (AIIMS BPL NO 2018)

- It predicts the prognosis
- It aids in the quality of care to meet the client's needs
- It studies the cause and effect of the illness
- It identifies the disease

Explanation: Nursing diagnosis usually points towards the potential problems that can occur in a client. Nursing diagnosis is developed based on data obtained during the nursing assessment. This is need based and is prioritized as per the urgency to provide quality care.

59. A post-operative patient receives a stat dose of injection Pethidine intramuscularly. After one hour, the nurse checks on pain relief. Which step of the nursing process is the nurse using here? (Daman & Diu NO 2018)

- Evaluation
- Assessment
- Implementation
- Planning

Explanation: Evaluation helps the nurse to assess her own interventions and also give her opportunity to improve it. The aim of the nurse is to evaluate the action of Pethidine on post-operative pain. So, the nurse uses the last step of nursing process that is evaluation. Assessment refers to collection of subjective and objective data, usually before planning for intervention.

60. An example of an objective data is:

(AIIMS Bhopal Grade-I 2018)

- Feeling of worry
- Discoloration of the skin
- Itching
- Nausea

Explanation: Objective data are measurable and overt data ("signs") obtained through observations, physical examination and diagnostic examinations. Whereas subjective data are the information from patient's point of view ("symptoms") including feelings, perceptions and concerns obtained through interview.

61. Nurse obtains vital signs and determines level of comfort for the patient. Which standard of practice is performed?

- Assessment
- Diagnosis
- Planning
- Implementation

Explanation: Obtaining vital signs is objective data and determining level of comfort by asking the patient is subjective data. Obtaining subjective and objective data from patient is known as assessment in nursing process. Nursing process includes assessment, nursing diagnosis, planning, implementation and evaluation.

62. Information verbalized or stated by the patient is known as:

- Objective data
- Subjective data
- Signs
- All of these

Explanation: Subjective data are collected or obtained via personal interactions with patient. Objective data are observable and measurable (signs) through physical examination, observation and or laboratory findings.



Ans.

63. b
64. a
65. a
66. c
67. c
68. a
69. a
70. a
71. b
72. c
73. c
74. b
75. a
76. c
77. a
78. b
79. c
80. c
81. c
82. c
83. c
84. b

63. Type of assessment in which more data is collected about already identified problem is:

- a. Initial assessment b. Focus assessment
c. Emergency assessment d. Time lapsed assessment

Explanation: Option b is the correct answer. In initial assessment, the assessment is done when the person enters the healthcare facility. Emergency assessment refers to assessment which is done in a life-threatening situation/emergency. Time lapsed assessments are carried out after initial assessment.

64. The first part of the nursing diagnosis is:

- a. Problem b. Etiology
c. Risk factor d. Evaluation

Explanation: The first part of the nursing diagnosis is problem.

65. Planning phase of nursing process will determine:

- a. Expected outcome
b. Intervention needs to be provided
c. Change in client condition
d. Actual problem of client

Explanation: In planning phase, the nurse will determine the goal or expected outcome. Each problem (nursing diagnosis) is assigned a clear, measurable goal for the expected beneficial outcome.

66. The nursing process provides a:

- a. Basis for nursing theories
b. Knowledge component of nursing
c. Systematic process for delivery of nursing care
d. Basis for acquiring body of knowledge

67. Which of the following is an objective data?

- a. Chest pain b. Complaint of dizziness
c. An evaluation of blood pressure
d. Complains of nausea

68. 'The patient will remain free from pain throughout hospitalization'. This statement is an example of a (an):

- a. Short term goal b. Long term goal
c. Nursing diagnosis d. Expected outcome

69. First step of nursing process is:

- a. Assessment b. Diagnosis
c. Planning d. Implementation

70. Collection of subjective data from patient is carried out in:

- a. Assessment phase b. Nursing diagnosis phase
c. Implementation phase d. Planning phase

71. Which of the following is an example of nursing diagnosis?

- a. Hypertension b. Pain
c. Shock d. Hyperglycemia

72. The interpretation of the information collected about the patient represents the:

- a. Assessment of the patient
b. Plan of care
c. Health problems of the patient
d. Nursing interventions implemented for the patient

73. Action phase of nursing process includes:

- a. Subjective assessment b. Planning
c. Implementation d. Evaluation

74. Priorities of planning in nursing process is done based on:

- a. Information processing model
b. Maslow's hierarchy of human needs
c. Erik Erikson's theory
d. Health-Illness continuum model

75. Patient-oriented outcomes should be derived from:

- a. Nursing diagnosis
b. Assessment
c. Evaluation
d. Planned interventions

76. Which of the following takes priority in planning nursing care for a client?

- a. Physician order b. Nurse's condition
c. Client's condition d. Hospital policy

77. The clinical manifestation that are objective are:

- a. Signs b. Symptoms
c. Disease d. Syndrome

78. The nurse compares the characteristics of acute renal failure with those of chronic renal failure and at the end selects acute renal failure. This process is called:

- a. Data collection b. Data interpretation
c. Data comparing d. Data lustering

79. Total number of steps in nursing process are:

- a. Three b. Four
c. Five d. Six

80. The primary source of data for evaluation is:

- a. Doctor b. Nurse
c. Client d. Family

81. Which of the following is subjective data of nursing assessment?

- a. Vomiting, pulse 82/min.
b. Respirations 22/min., blood pressure 120/70 mm Hg
c. Nausea and abdominal pain
d. Pale skin and moist hands

82. Conditions that increase vulnerability to a disease are known as:

- a. Etiology b. Precipitating factor
c. Risk factors d. Pathophysiology

Explanation: Correct answer is option c. A risk factor of predisposing factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury.

83. Data that include all the measurable and observable pieces of information are called: (AIIMS BPL NO 2018)

- a. Subjective data b. Hearsay data
c. Objective data d. Documented data

Explanation: Objective data are observable and measurable data ("signs") obtained through observation, physical examination, and laboratory and diagnostic testing. Subjective data are gathered when the patient himself tells the nurse about it.

84. When considering a client's symptoms, how should the nurse categorize a client's complaint of tinnitus? (RAK MSc 2018)

- a. Objective b. Subjective
c. Prodromal d. Functional

Explanation:

- Tinnitus is a ringing sensation experienced in the ears that can only be felt by the person experiencing it and cannot be observed by the health personnel. Hence it is a subjective data. Subjective data is what the patient tells as his/her their symptoms are, including feelings, perceptions and concerns.
- Objective data is the one which a nurse can observe in the patient.



85. A method of data interpretation among the following is: (AIIMS BPL NO 2018)

- Interview
- Observation
- Prioritization
- Listening

Explanation: Interview, observation and listening are the methods of data collection not data interpretation whereas prioritization is an action (interpretation) that can be done after collection of data.

Strategy: Find the odd one out.

86. Nurse uses the nursing process as a method of: (ESIC 2019)

- Planning, organizing and delivering patient care
- Communicating with patients and families
- Meeting the legal requirements and standards in nursing
- Meeting public expectations of nurse

Explanation: The purpose of nursing process is primarily to organize and deliver care to the patient. Communicating with patients, meeting legal requirements and standards, meeting public expectations are duties and responsibilities that are part of nursing process.

87. The type of assessment that includes data related to a client's biological, cultural, spiritual and social need is called:

- Behavioral assessment (AIIMS-BBS SNO 2019)
- Screening assessment
- Comprehensive assessment
- Focused assessment

Explanation: Comprehensive means including everything. Assessing biological, cultural, spiritual and social needs is called comprehensive assessment. Behavioral assessment is a method used to assess behavior. Screening is a process for evaluating the possible presence of a particular problem. Detailed nursing assessment of specific body system(s) relating to the presenting problem is known as screening.

88. Purpose of assessment is to:

- Make nursing diagnosis
- To collect basic data regarding client's health status
- To provide intervention
- For giving health education

Explanation: Assessment provides basic data regarding the client, which helps us to find out the actual and potential problem as well as the changes occur in client's health during the treatment course.

DOCUMENTATION & REPORTING

89. Your patient says that he "urinates at night" and it is affecting his daytime alertness. You would document this as: (AIIMS Bhopal Grade-I 2018)

- Oliguria
- Nocturia
- Dysuria
- Polyuria

Explanation: Nocturia or nocturnal polyuria is defined as the need to wake (one or more times) and pass urine at night. It should be distinguished from enuresis, where urine is passed unintentionally during sleep.

90. A post-operative patient is brought to the postsurgical ward. The receiving nurse assessed the patient for patent airway and stable vital signs. Which of the following should be performed next?

- Complete the admission file work
- Log roll the patient to evaluate cleanliness of bed linens
- Assess dressings for bleeding
- Pain assessment on a scale of 1 to 10

91. Time limit for registering birth is within:

(AIIMS Bhopal Grade-I 2018)

- 21 days
- 10 days
- 14 days
- 7 days

Explanation: The registration of births and deaths act passed in 1969, for the regulation of registration of births and deaths and for matters connected therewith. The normal period of 21 days (from the date of occurrence) has been prescribed for reporting the birth, death and still birth events.

92. The disadvantages of Electronic Health Records are the following; EXCEPT: (AIIMS Raipur Grade II 2017)

- Expensive
- Lack of integration
- Downtime processes
- Increased medical errors

Explanation: The disadvantages of electronic health records are expensive, Lack of integration and downtime process.

93. The primary purpose of the patient record is:

- Education
- Communication
- Research
- Funding

94. Which of the following records refers to short and objective description of incidents or events that are important to the observer?

- Admission record
- Anecdotal record
- Observation checklist
- Investigation report

95. All of the following are principles of record writing; EXCEPT:

- Accurate
- Error-free
- Use standard abbreviation
- Data redundancy

96. What is the primary purpose of an incident report?

- Identifying risks
- Staff evaluation
- Disciplinary action
- Audiotape report

97. How would the nurse record smoking history on a patient who has smoked 2.5 packs of cigarettes per day for 10 years? (RAK MSc 2018)

- Patient has smoked cigarettes for 10 years
- Patient smokes 2.5 packs of cigarettes per day
- Patient has a 12.5 pack-year smoking history
- Patient has a 25 pack-year smoking history

Explanation:

- The formula for calculating "pack years" for a patient who smokes is:

Pack years = No. of packs smoked per day × No. of years person smoked

As per the above data,

$$\text{Pack years} = 2.5 \times 10 = 25$$

So, the nurse records smoking history on a patient who has smoked 2.5 packs of cigarettes per day for 10 years as Patient has a 25 pack-year smoking history.



Ans.

85. c
86. a
87. c
88. b
89. b
90. c
91. a
92. d
93. b
94. b
95. d
96. a
97. d

"It is health that is real wealth and not pieces of gold and silver."

—Mahatma Gandhi



SYNOPSIS

KEY TERMINOLOGIES

- **Pharmacology:** It is derived from Greek words 'pharmakon' which means drugs and 'logos' which means study or knowledge. It is the scientific study of the origin, nature, chemistry, effects and uses of drugs.
- **Drug/medications:** Any chemical substance which affects living systems. French word 'drogue' means 'dry herb' – used for treatment of disease, for the prevention of illness of pathologic states and for diagnosing disease condition.
- **Chemotherapy: Therapeutic treatment of various local or systemic infections or malignancies by using various drugs or chemicals is called chemotherapy.**
- **Pharmacognosy:** The branch of pharmacology dealing with the economic, biological and chemical aspects of natural drugs and their constituents. Study of the sources of drugs and the physical characteristics of crude or unrefined drugs, e.g., plants.
- **Pharmacodynamics** is the effect that drugs have on the body (what drug does to the body).
- **Pharmacokinetics** is the study of the way in which drugs move through the body during **absorption, distribution, metabolism** and **excretion** (what body does to the drug).
- **Absorption**
 - Physiological considerations in absorption: **Blood flow, total surface area, time of arrival of the drug** and **time of drug at absorption site.**
 - Other considerations for absorption: **Solubility, chemical stability** and solubility of drug in lipids.
- **Distribution**
 - Drugs are distributed, into major body fluids (e.g., plasma).
 - Drug distribution is affected by the extent that the drug binds to plasma proteins and barriers.

- **Biotransformation**
 - It is a process of metabolizing drugs in the body.
 - Occurs mainly in liver.
 - Prodrugs are only activated by the hepatic metabolism e.g., **Levodopa.**
- **Excretion:** Excretion includes renal (by active glomerular filtration and fecal elimination).
- The time of the onset of drug action is determined by the time taken by the drug to reach to the site of action. It is largely controlled by:
 - Route of administration
 - Rate of absorption
 - Manner of distribution.
- **Bioavailability:** It is a measure of fraction of administered drug that reaches the systemic circulation in the unchanged form.
- **First Pass Metabolism:** It is the metabolism of a drug at the site of absorption during its passage from the site of absorption into the systemic circulation. All orally administered drugs undergo first pass metabolism. Drugs administered through sublingual, transdermal and parenteral routes do not undergo first pass metabolism (bypasses portal circulation)
- **Agonist:** These are the drugs which bind to the receptor and produce same biological effect as that of the receptor.
- **Antagonist:** These are the drugs which oppose the action of the receptor or an agonists.
- **Antidote:** A drug which can counteract a form of poisoning, e.g., Atropine is an antidote to organophosphorus poisoning.
- **Lethal Dose 50 (LD50):** Standard measure of the toxicity of a drug/substance that will kill half of the sample population of a specific test animal in a specific period.
- **Pharmacovigilance:** The science and activities relating to the detection, assessment,



Key Points

- Father of Pharmacology - Oswald Schmiedeberg
- Pharmacokinetics - What the body does to the drug?
- Pharmacodynamics - What the drug does to the body?
- Bioavailability of Intravenous (IV) route is 100%.
- Lipophilic drugs (barbiturates, benzodiazepines) are better absorbed in intestine than hydrophilic drugs.
- The liver is the main drug metabolizing organ in the body.
- The first-pass effect can occur in the gastrointestinal tract, the liver and lung.





DIFFERENT ROUTES OF ADMINISTRATION, ITS ADVANTAGES AND DISADVANTAGES

Table 3: Advantages and disadvantages of different routes

Route	Advantages	Disadvantages
Oral route	Easy to take No professional assistance required Economical	Gastric acid may decrease the drug efficiency It causes GI irritation Variable rate of absorption will occur
Sublingual route	This helps to avoid the first pass metabolism and interaction with gastric acid	Not suitable for all the preparation
Rectal route	This helps to avoid the first pass metabolism and interaction with gastric acid	Not suitable for all the preparation Administration may affect the dignity of the patient.
Parenteral (refers to IV, IM and SC) Routes		
Intravenous	Fast action and 100% bioavailability	Lack of aseptic technique may lead to sepsis. Danger of extravasation. Phlebitis can occur if irritant drugs are administered
Intramuscular	Rapid absorption	Painful, increased risk for tissue damage
Subcutaneous	Provide drug over a period of time, i.e., it promotes slow absorption of drug	Absorption rate will be varying
Intradermal route	Absorption is slow, so useful for testing allergies	Amount of drug administered must be small
Inhaled drug	Large absorption area	

SPECIAL DRUG DELIVERY SYSTEM

- **Dermojet:** This is painless and needleless method of drug administration. A high velocity jet of drug solution is projected through a micro-fine orifice using a gun-like device. The drug will get deposited in the subcutaneous tissue.
- **Pellet implantation:** The drug is in the form of solid pellet. It is introduced surgically with the help of trocar and cannula. The drug will be released from the solid pellet for weeks and month, e.g., DOCA, testosterone.
- **Implants:** Drug packed in tube or capsule is implanted under the skin. Uniform and slow release of drug occurs for months together.
- **Liposomes:** Minute vesicles made of phospholipids into which the drug is incorporated. It is used for targeted delivery, e.g., Amphotericin B and Anticancer drugs.
- **Monoclonal antibodies:** These are antibodies which selectively react with specific antigen, e.g., Rituximab, cetuximab.

Table 4: Drugs and their deposition in the various body tissues

Body tissues where deposition occurs	Drugs
Bone and teeth	Tetracycline, heavy metals
Skeletal muscle and heart	Digoxin, emetine (bound to muscle proteins)
Liver	Chloroquine, tetracycline, emetine, digoxin
Kidney	Digoxin, chloroquine, emetine
Thyroid	Iodine
Retina	Chloroquine (bound to nucleoproteins)



Key Points

- Intradermal route is used for testing allergies (test dose) and BCG vaccination.
- Angles for injections:
 - Intradermal - 10 to 15 degree
 - Intravenous - 25 degree
 - Subcutaneous - 45 degree
 - Intramuscular - 90 degree
- Subcutaneous route is not useful for emergency due to slow absorption rate.
- Intravenous administration is useful for large volume administration and for emergency.
- Sustained/Controlled release tablets reduce the dosing frequency especially in chronic diseases. There is less chance of over dosage.
- Transdermal drug delivery system is a form that delivers the drug at a constant rate to systemic circulation, e.g., Transdermal patch & Ointment.
- Implantable insulin pumps implanted in subcutaneous tissue delivers insulin depends on plasma glucose level.





Commonly used Abbreviations in Prescriptions

- **R_x**: The symbol R is an abbreviation for the Latin word RECIPE, which means take thou or you take. The line on the foot of R is set to designate an invocation to Jupiter, the God of Knowledge, learning and healing.
- **Tab**: Tablet
- **Cap**: Capsule
- **Inj**: Injection
- **IM**: Intramuscular
- **IV**: Intra venous
- **SC**: Subcutaneous
- **I/D**: Intradermal
- **OD**: Once in a day
- **BD/BID**: Bis in die (Twice a day)
- **TDS**: Ter in die sumendum (To be taken thrice a day)
- **TID**: Ter in die (Three times a day)
- **QID**: Quarter in die (Four times a day)
- **HS**: Hora somni (At bed time)
- **Stat**: Stain (Immediately)
- **Rept**: Repetatur (Repeat)
- **Non rept**: Non repetatur (Non repeat)
- **AC**: Ante cibum (Before meals)
- **PC**: Post cibum (After meals)
- **NPO**: Nil per orally (Nothing to taken by mouth)
- **BBF**: Before breakfast
- **AD**: After dinner
- **SOS**: As and when required

CONVERSION EQUIVALENCE OF WEIGHT

Table 5: Conversion equivalence of weight

Unit	Symbol	Equivalent
1 kilogram	kg	1,000 grams (g)
1 kilogram	Kg	2.2 pounds (lb)
1 gram	g	1,000 milligrams (mg)
1 milligram	mg	1,000 micrograms (µg)
1 microgram	µg	1,000 nanograms (ng)
1 ounce	oz	28.35 g
1 pound	Lb	454 g
1 gram	g	15.432 grains

CONVERSION EQUIVALENCE OF VOLUME

Table 6: Conversion equivalence of volume

Unit	Equivalent
1 drop (gtt)	0.05 mL
1 mL	20 drops
1 teaspoon full	5 mL
1 Tablespoon full	15 mL
1 mL	16.23 minims
1 minim	0.06 mL
1 pint	473 mL
1 quart	949 mL
1 gallon	3745 mL



DRUG CALCULATION

- To convert a smaller unit (e.g., a gram) into a larger unit (e.g., a kilogram), divide by 1000, so
 - $3000 \text{ g} \div 1000 = 3 \text{ kg}$
- To convert a larger unit (e.g., a kg) into a smaller unit (e.g., a gram), multiply by 1000, so:
 - $3 \text{ kg} \times 1000 = 3000 \text{ g}$

Basic Formula

There is more than one way to do a drug calculation, but the simplest and most widely used method is the basic formula shown here:

$$\frac{(D \times Q)}{H} = X$$

D = desired dose

H = strength available

Q = quantity or unit of measure (for tablets Q = 1, for liquids Q can vary)

X = dose to be determined/amount to be given

Practice Question

2. Nurse Ramya have to infuse 500 mL DNS solution in over 6 h Drop factor is 20 gtt/mL. What flow rate (drops/min) will nurse Ramya on the IV infusion pump?

Explanation:

Formula:

$$\begin{aligned} \text{Drop/min} &= (\text{Total infusion volume (in mL)} \times \text{drop factor}) / \text{infusion time (in minutes)} \\ &= \frac{(500 \times 20)}{360} \\ &= \frac{10,000}{360} \\ &= 27.7 \text{ (rounded off to } 28 \text{ drops/min)} \end{aligned}$$

Note

While calculating for tablets $Q = 1$; for liquids, usually Q is the no. of mL given. In this case 5 mL)

Some Examples

1. The doctor orders a dose of 100 mg to be given orally. You have 25 mg tablets. How many tablets should you give?

$$\frac{(100 \times 1)}{25} = X$$

$$X = 4 \text{ tablets}$$
2. The patient requires 800 mg of liquid to be given orally. You have 250 mg in 5 mL of solution. What volume of drug should be given? Applying the same formula given above

$$\frac{(800 \times 5)}{250} = X$$

$$400/25 = 16 \text{ mL}$$
3. The patient needs 270 mg of drug D by injection. 150 mg in 5 mL of liquid is available. How many mL will you administer?

$$\frac{(270 \times 5)}{150} = X$$

$$X = 9 \text{ mL}$$





ANTIMICROBIAL AGENTS

Table 7: Antibiotics, antifungals and antivirals with their examples, therapeutic uses and side effects

Class of drugs	Examples	Therapeutic uses	Side effects
Penicillins	<p>Natural penicillin</p> <ul style="list-style-type: none"> • Penicillin G (Acid-labile) • Penicillin V (Acid-resistant) <p>Penicillinase-resistant agent</p> <ul style="list-style-type: none"> • Oxacillin • Cloxacillin <p>Aminopenicillins</p> <ul style="list-style-type: none"> • Ampicillin • Amoxicillin <p>β-lactamase inhibitors</p> <ul style="list-style-type: none"> • Clavulanic acid • Sulbactam • Tazobactam 	<ul style="list-style-type: none"> • Streptococcal infection • Gonococcal and syphilis • <i>Pseudomonas aeruginosa</i> • <i>Haemophilus influenzae</i> 	<ul style="list-style-type: none"> • Hypersensitivity. • Skin rash to anaphylactic shock (penicillin allergy) • It is more common with parenteral administration of penicillin
Cephalosporins	<p>First generation</p> <ul style="list-style-type: none"> • Cefazolin • Cefadroxil • Cefalexin <p>Second generation</p> <ul style="list-style-type: none"> • Cefuroxime • Cefoxitin • Cefaclor • Cefprozil <p>Third generation</p> <ul style="list-style-type: none"> • Cefixime • Cefotaxime • Ceftriaxone <p>Fourth generation (parenteral)</p> <ul style="list-style-type: none"> • Cefepime • Cefpirome <p>Fifth generation (parenteral)</p> <ul style="list-style-type: none"> • Ceftobiprole • Ceftaroline 	<ul style="list-style-type: none"> • Urinary Tract infection (UTI) • Pneumonia • Serious bacterial infections • Soft tissue infection 	<ul style="list-style-type: none"> • Minor gastrointestinal complaints • Nephrotoxicity • Thrombophlebitis on IV (intravenous) administration
Aminoglycosides	Streptomycin, Amikacin, Gentamicin, Neomycin, Kanamycin, Tobramycin	<ul style="list-style-type: none"> • Gram negative pneumonias • Pseudomonas infections 	<ul style="list-style-type: none"> • Nephrotoxicity • Ototoxicity • Neuromuscular blockage
Tetracyclines	Tetracycline, Doxycycline, oxytetracycline, Minocycline and Demeclocycline.	<ul style="list-style-type: none"> • Atypical pneumonias • Mycoplasma infection 	<ul style="list-style-type: none"> • Tooth discoloration in children • Growth retardation • Bone marrow depression • Hypersensitivity • Oral and vaginal candidiasis

Contd...



Key Points

- Alexander Fleming discovered Penicillin in 1928.
- Penicillin was the first antibiotic used clinically in 1941.
- Cephalosporins are chemically similar to penicillins.
- Tetracyclines is contraindicated in pregnancy and in young children.
- Tooth discoloration and growth retardation are the major side effects of Tetracyclines.
- **Gray baby syndrome** is an adverse reaction to chloramphenicol that is characterized by abdominal distention, hemodynamic collapse, and ash-gray skin discoloration in neonates.
- As per the WHO guidelines, ciprofloxacin or ofloxacin is recommended for fully sensitive typhoid cases.
- Neomycine and Soframicine are topically used Aminoglycosides.
- Ototoxicity and Nephrotoxicity are the major side effects of Amnioglycosides.



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- 296. Paracetamol is an:** (RPSG NG-II, 2010)
- | | |
|----------------|-----------------|
| a. Antipyretic | b. Antitussives |
| c. Antibiotic | d. Antiemetic |

Explanation: Paracetamol (acetaminophen) is an antipyretic (reduce fever) and analgesic (reduce pain) agent.

- 297. A client receiving morphine sulfate should be observed for:** (Kerala PSC, Nov 2014)

- | | |
|---------------------------|---------------------|
| a. Respiratory depression | b. Blood dyscrasias |
| c. Gastritis | d. Jaundice |

- 298. Opioids are obtained from:** (Staff Nurse G II 2014)

- | | |
|----------------------|-----------------------|
| a. Erythroxylum coca | b. Claviceps purpurea |
| c. Cannabis sativa | d. Papaver somniferum |

- 299. NSAIDs are used in all; EXCEPT:**

- | | |
|-------------------------|--------------------|
| a. As analgesic | b. In peptic ulcer |
| c. Rheumatoid arthritis | d. Osteoarthritis |

- 300. Which of the following drug is an example of Synthetic opioid analgesic?**

- | | |
|-------------|-----------------|
| a. Aspirin | b. Morphine |
| c. Fentanyl | d. Indomethacin |

- 301. Analgesics are prescribed to:** (RPSG NG-II, 2010)

- | | |
|-----------------|-------------------|
| a. Induce sleep | b. Give rest |
| c. Relieve pain | d. Kill pathogens |

- 302. Contraindications to aspirin are all; EXCEPT:**

- | | |
|-----------------|-------------------------|
| a. Peptic ulcer | b. Bleeding tendencies |
| c. Chicken pox | d. Rheumatoid Arthritis |

- 303. Which one of the following is aspirin?**

- | | |
|------------------------------|----------------------------|
| a. Methyl salicylate | b. Para amino benzoic acid |
| c. Para amino salicylic acid | d. Acetyl salicylic acid |

- 304. Tramadol is:**

- | | |
|------------------|---------------------|
| a. Antiflatulent | b. Antireflux drug |
| c. Beta blocker | d. Opioid analgesic |

LOCAL ANESTHETICS

- 305. The nurse has applied EMLA cream as ordered. How does the nurse assess that cream has achieved its purpose?** (AIIMS Raipur NO 2019) :

- | |
|--|
| a. Assess the skin for redness |
| b. Note any blanching of the skin |
| c. Lightly tap the area where the cream is applied |
| d. Gently poke the individual with a needle |

Explanation: Eutectic mixture of local anesthetics (EMLA) is a combination of prilocaine and lidocaine. Lightly tapping the area where the cream is applied is the correct way to assess whether the cream has achieved its purpose or not.

- 306. Which of the following local anesthetic agent has shorter duration of action?**

- | | |
|----------------|----------------|
| a. Lidocaine | b. Procaine |
| c. Bupivacaine | d. Ropivacaine |

Explanation: Procaine exerts shorter local anesthetic action. Procaine is preferred local anesthetic agent in patient with liver disease. It is not used these days.

- 307. The local anesthetic which also acts as an antiarrhythmic agent:**

- | | |
|----------------|----------------|
| a. Cocaine | b. Lidocaine |
| c. Bupivacaine | d. Ropivacaine |

Explanation: Lidocaine acts as local anesthetic as well as anti-arrhythmic agent.

- 308. The local anesthetics primarily acts on:**

- | |
|---|
| a. Inactivated K ⁺ channels |
| b. Inactivated Na ⁺ channels |
| c. Activated Ca ⁺ channels |
| d. Resting K ⁺ channels |

- 309. The most cardiotoxic local anesthetic among given drugs is:**

- | | |
|----------------|---------------|
| a. Procaine | b. Lidocaine |
| c. Bupivacaine | d. Lignocaine |

- 310. The purpose of adding a vasoconstrictor to a local anesthetic drug is:**

- | |
|--|
| a. To increase the duration of local anesthetic effect |
| b. For rapid action of local anesthetic |
| c. To minimize the allergic reaction |
| d. To enhance the affinity to Na ⁺ channels |

Explanation: Addition of a vasoconstrictor to a local anesthetic has the following benefits:

- Decrease in the peak plasma concentration of local anesthetic (LA)
- Increase in the duration of LA effect (by reducing the absorption into the circulation)
- Reduction in minimum concentration of LA required for nerve block.
- Decrease of blood loss during surgery.

- 311. A higher dose of local anesthetic agent was inadvertently administered through Intravenous route. Which of the following system is most likely involved in the toxic effect?**

- | |
|----------------------------|
| a. Cardiovascular system |
| b. Immune system |
| c. Gastrointestinal system |
| d. Respiratory system |

MUSCLE RELAXANTS

- 312. Barbiturates are contraindicated in older persons because it cause:**

- | | |
|-----------------|-------------------------|
| a. Convulsions | b. Delirium |
| c. Panic attack | d. Urinary incontinence |

- 313. Which of the following drug is used to reverse the muscle relaxant effect of tubocurarine?**

- | | |
|--------------------|----------------|
| a. Succinylcholine | b. Neostigmine |
| c. Dantrolene | d. Baclofen |

- 314. Which of the following skeletal muscle relaxant has the lowest duration of action?**

- | | |
|---------------|--------------------|
| a. Vecuronium | b. Succinylcholine |
| c. Dantrolene | d. Tubocurarine |

- 315. Which of the following muscle relaxant is used to treat spasticity and malignant hyperthermia of neuroleptic malignant syndrome?**

- | | |
|----------------|---------------|
| a. Vecuronium | b. Dantrolene |
| c. Neostigmine | d. Baclofen |

- 316. A patient scheduled for a mastectomy surgery has a 10 year history of COPD. Which of the following muscle relaxant is contraindicated in this patient during the surgery?**

- | | |
|-----------------|--------------------|
| a. Clonidine | b. Vecuronium |
| c. Tubocurarine | d. Succinylcholine |



Ans.

296. a
297. a
298. d
299. b
300. c
301. c
302. d
303. d
304. d
305. c
306. b
307. b
308. b
309. c
310. a
311. a
312. b
313. b
314. b
315. b
316. c

“A person cannot accumulate a fortune very well when he is sick.”
—P.T. Barnum

COMMUNITY HEALTH NURSING



SYNOPSIS

Community: A group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings.

Community health nursing: Community health nursing is a synthesis of nursing practices and public health practices applied in promoting and preserving the health of population.

CONCEPTS AND DETERMINANTS OF HEALTH AND WELL-BEING

Concepts of Health

Health: It is a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity (WHO 1948).

Following are the changing concepts of health:

- **Biomedical concept:** This has been viewed that health is an absence of disease and if one was free from disease then the person was considered as healthy. This concept has its basis in germ theory.
- **Ecological concept:** This has been viewed that health is a dynamic equilibrium between man and his environment and disease is maladjustment of the human being to the environment.
- **Psychosocial concept:** According to this concept health is influenced by social, psychological, cultural, economic and the political factors.

- **Holistic concept:** This model is a synthesis of all the above concepts. It recognizes the strength of social, economic, political and environmental influences on health. This approach implies that all sectors of society have an impact on health.

Dimensions of Health

- Physical dimension
- Mental dimension
- Social dimension
- Spiritual dimension

Concept of Disease

- A condition in which body function is impaired.
- A maladjustment of human to the environment.

Causes

- Supernatural causes and karma
- Theory of humors (fluid)
- Theory of contagion
- Germ theory
- Epidemiological triad
- Multi-factorial causation
- Web of causation

Disease: Biological concept-physiological/psychological dysfunction

Illness: Socio-pathological concept-subjective feeling of not being well.

Sickness: Biological concept of social dysfunction



Key Points

- The three features of a community are location, population and social system.
- ENGLAND is the first country to start Concept of Health care and Public health.
- In 1861, Louis Pasteur published his germ theory which proved that bacteria caused diseases.
- Father of Public health is 'Cholera'
- Fastigium stage is the highest point of disease or illness.



Determinants of Health

Table 1: Factors of determinants of health

Determinants	Factors
Biological	Genetic make-up, Growth and Development
Behavioral and sociocultural conditions	Life style, personal habit (smoking, drinking), nutritional status, sleep pattern, physical activity
Environment	<p>Internal environment: Each and every body tissue and its functioning</p> <p>External environment (macro environment): All that external to the individual and can be divided as physical, biological, chemical and psychosocial</p> <p>Domestic environment (micro environment): Way of living and lifestyle such as eating habits, smoking, drinking, use of drugs, etc.</p>

Contd...



SURVEILLANCE AND MONITORING FOR DISEASE

- **Screening:** It is the search for unrecognized disease or defect by means of rapid application of test, examinations or other procedures in apparently healthy individuals.
- **Quarantine:** It is a strict isolation imposed to prevent the spread of disease. Isolation/restriction of a person or domestic animal exposed to communicable disease for a period of time not longer than usual incubation period of the disease.
- **Monitoring:** Performance and analysis of routine measurement to detect changes in the environment and health status of population, e.g., monitoring of air pollution, ongoing measurement of performance of health service.
- **Surveillance:** To watch over with great attention. Continuous screening of the factors that determine the occurrence and distribution of diseases.

Types of Surveillance

- **Passive surveillance:** Regular reporting of disease data by all institutions that see patients and are part of reporting network is known as passive surveillance.

- **Active surveillance:** Systematic collection of data (agency initiated), e.g., field surveys.
- **Sentinel surveillance:** Reporting by specified units from defined area. A method of identifying missing cases.
- **Syndromic surveillance:** Surveillance using health-related data that precede diagnosis and signal a sufficient probability of a case or an outbreak to warrant further public health response.
- **Sensitivity:** It is defined as the ability of a test to identify correctly all cases those who have the disease that is true positive. A 90% sensitivity means that 90% of the diseased people screened by this test will be identified as positive and 10% of patients who have the disease will be identified as negative.
- **Specificity:** It is the ability of a test to correctly identify those who do not have disease that is true negative. A 90% specificity means 90% of the non-diseased person will give true negative result. 10% of non-diseased people screened by this test will be wrongly classified as diseased when they are not actually negative.



Key Points

- International Health Regulation (IHR) entered into force from 15th June 2007. It requires 176 member countries to report certain disease outbreaks and public health events to WHO.
- The term sensitivity was introduced by **Yerushamy**.

ICE BERG PHENOMENON

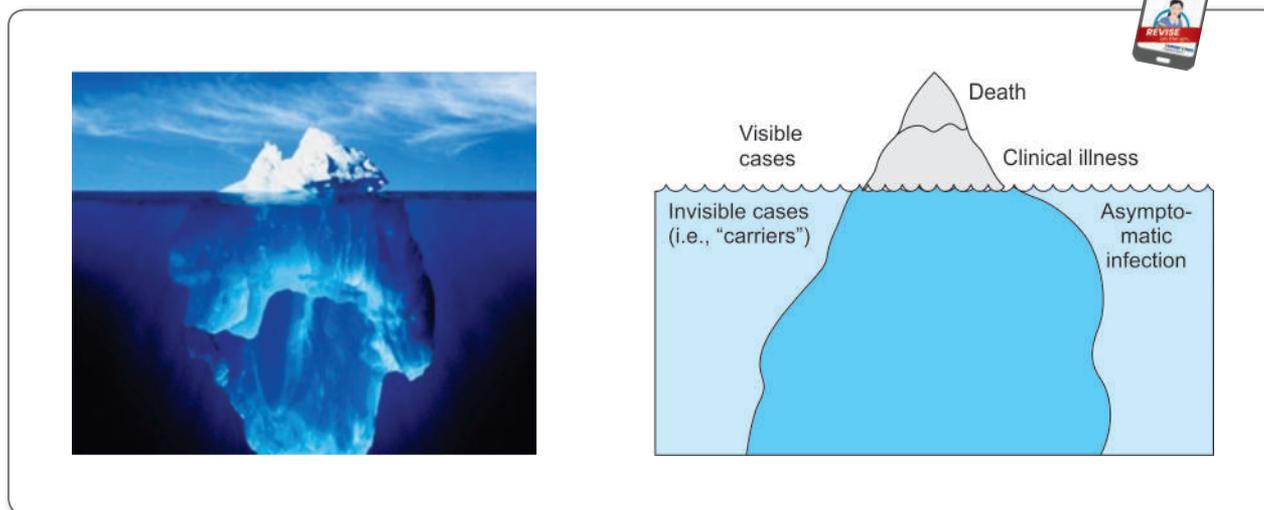


Figure 6 ■ Ice berg phenomenon

- Disease in the community is compared with an Ice berg.
- **Floating tip:** Physician can see disease in the community (clinical cases).
- **Submerged portion:** Invisible (hidden part) cases of disease - latent, unapparent, presymptomatic, undiagnosed and carrier in the community.
- **Water line:** Between apparent and subclinical cases or unapparent disease (subclinical cases).





- When two live vaccines need to be administered either administer them simultaneously at two different sites or maintain a gap of four weeks between the administrations of two vaccines.
- Live vaccines will achieve its immunization with single dose, **exception is polio vaccines** which require three or more doses at spaced interval to produce effective immunity.
- Live vaccines must be stored properly to maintain its potency.
- **Inactivated or killed vaccines**
 - Organisms killed by heat or chemicals when infected into the body stimulate immunity. They are usually safe but are less effective than live vaccines.
 - In most cases these kinds of vaccines require a booster dose.
 - The duration of immunity following killed vaccines vary from months to many years.
 - The only absolute contraindication against killed vaccines are severe general or local reaction to the previous dose.
- **Toxoid**
 - Certain organisms produce exotoxins (diphtheria, tetanus). The toxins produced by these organisms are detoxified and used in the preparation of vaccines.

- **Cellular fractions**
 - In certain instances, vaccines are prepared from extracted cellular fractions. For example, meningococcal, pneumococcal.
- **Combinations vaccines**
 - If more than one immunizing agent is included in a single vaccine they are called as combination vaccines. The aim of combination vaccine is to simplify administration, reduce cost and minimize the number of contact of patient with health system. For example, **DT, DPT, MMR. Pentavalent vaccine.**

Immunoglobulin

The human immunoglobulin system composed of major five immunoglobulins, IgG, IgA, IgD, IgM, IgE.

- **IgG:** Major immunoglobulin in serum. It consists of 85% of total serum immunoglobulin. It is the only immunoglobulin which can cross the placenta.
- **IgM:** Accounts for 10% serum immunoglobulin. It represents the antibody that promptly formed with exposure to antigen. Its presence may be indicative of recent infection.
- **IgA:** About 15% of total serum immunoglobulin. It is found relatively in larger quantities in body secretions.



Key Points

- **IgG** is the major serum immunoglobulin and is the only immunoglobulin which can cross the placenta.
- **IgA** is the main immunoglobulin which is present in body secretions.
- **Presence of IgM** antibody in the serum of a newborn baby suggestive of congenital infection.
- **IgE** mediate type-1 hypersensitivity reactions.
- **IgM** is the macro immunoglobulin.
- Immune response of Killed vaccine is relatively poor in comparison to live vaccines
- Killed vaccines are safer than live vaccines.
- Adjuvants required in Killed vaccine

Table 4: Immunizing agents

Types of vaccines	Examples
Live attenuated (Mnemonic: MY ROME TRIP)	M — Mumps Y — Yellow fever R — Rubella O — Oral Polio; Oral Typhoid M — Measles E — Endemic Typhus T — TB Vaccine (BCG) R — Rubella I — Influenza P — Plague
Inactivated/killed vaccines	Typhoid Cholera Pertussis CS meningitis Plague Rabies Salk (polio vaccine) Influenza Hepatitis A Hepatitis B Japanese encephalitis
Toxoids	Diphtheria Tetanus

Contd...

Practice Questions

10. All of the following vaccines are inactivated or attenuated whole pathogen, except
- a. Salk
 - b. Rabies
 - c. Hepatitis A
 - d. Tetanus

Ans. (d) Tetanus

Explanation: Tetanus vaccine, also known as tetanus toxoid (TT), is a toxoid vaccine used to prevent tetanus.

Rabies and Hepatitis A are inactivated/killed vaccine whereas Sabin (oral polio) is a live attenuated vaccine.

11. The first ever recombinant vaccine approved for human use is
- a. DPT vaccine
 - b. Hepatitis B vaccine
 - c. Polio vaccine
 - d. Influenza vaccine

Ans. (b) Hepatitis B vaccine





Types of vaccines	Examples
Immunoglobulin	
Human immunoglobulin	Hepatitis A Measles Rabies Tetanus Mumps Hepatitis B Varicella Diphtheria
Non-human	Diphtheria Tetanus Gas gangrene Botulism Rabies

Table 5: Comparison between live and killed vaccines

Characteristics	Killed vaccine	Live vaccine
Number of doses	Multiple	Single
Need for adjuvant	Yes	No
Duration of immunity	Shorter	Longer
Effectiveness of protection	Lower	Greater
Immunoglobulin produced	IgG	IgA and IgG
Mucosal immunity produced	Poor	Yes
Cell-mediated immunity produced	Poor	Yes
Residual virulent virus in vaccine	Possible	No
Reversion to virulence	No	Possible
Excretion of vaccine and transmission to non-immune contact	No	Possible
Interference by other virus in the host	No	Possible
Stability at room temperature	High	Low

COLD CHAIN

- Cold chain is a system of storage and transport of vaccines at low temperature from the manufacturer to the actual vaccination site. The cold chain system is necessary because vaccine failure may occur due to failure of storage and transport under strict temperature controls.
- Vaccine stored in the freezer compartment are **polio and measles**.
- Vaccine which must be stored in the cold part and never allowed to freeze are **BCG, DPT, DT, TT, typhoid and diluents**.
- Vaccines must be protected from sunlight and prevented from contact with antiseptics.
- At health center most of the vaccine (except polio) can be stored up to 5 weeks, if refrigerator temperature is strictly kept between 4°C and 8°C.
- Storage of opened vial:
 - With preservatives: up to **three hours**
 - Without preservatives: up to **one hour**

The Cold Chain Equipment

- Walk in cold room
- Deep freezer
- Small deep freezer
- Cold boxes
- Vaccine carrier
- Day carrier
- Ice packs.

Ice-lined Refrigeration: (ILR)

- Important in the cold chain link
- Maintains temp between +2°C and +8°C
- Small size ILR in PHC level
- ILR is divided into two parts
 - **Upper part:** Storing for freeze sensitive vaccines, e.g., DPT, TT, hepB, IPV, Pentavalent
 - **Lower part:** OPV, BCG, measles, Ig

VVM

- Vaccine viral monitoring
It is a label containing a heat-sensitive material to check the status of vaccines viability.

Note

Rabies Immune Globulin (RIG) - RIG always should be used in conjunction with rabies vaccine in previously unvaccinated persons.



Key Points

Intensified Mission Indradhanush (IMI) 3.0:

- The scheme has rolled out to cover children and pregnant women who missed routine immunisation during the Covid-19 pandemic.
- **Provides vaccination against 12 Vaccine-Preventable Diseases (VPD):**
 - Diphtheria
 - Whooping cough
 - Tetanus
 - Polio
 - Tuberculosis
 - Hepatitis B
 - Meningitis and pneumonia
 - Haemophilus influenzae type B infections,
 - Japanese encephalitis (JE)
 - Rotavirus vaccine
 - Pneumococcal conjugate vaccine (PCV) and
 - Measles-rubella (MR).



Key Points

- Minimum Interval between two live vaccines is 4 weeks.
- Post exposure immunisation is given in
 - M - Measles
 - T - Tetanus
 - R - Rabies
 - M - Meningococcal meningitis
 - C - Chicken pox
 - H - Hepatitis





How to read a VVM?	
	✓ Inner square is lighter than outer circle. If the expiry date has not been passed, USE the vaccine.
	✓ At a later time, inner square is lighter than outer circle, If the expiry date has not been passed, use the vaccine.
	✗ Discard point: Inner square matches colour of outer circle. Do not use the vaccine. Inform your supervisor.
	✗ Beyond the discard point: Inner square darker than outer circle. Do not use the vaccine. Inform your supervisor.

Vaccine Vial monitor	
	Stage 1 = Good: Utilize
	Stage 2 = Good: Utilize
	Stage 3 = bad: Don't Utilize
	Stage 4 = bad: Don't Utilize

The central square is lighter than the surrounding circle | The central square is equal to, or darker than the surrounding circle

Vaccine Storage

Do's

- Keep the equipment in cold room away from direct sunlight and at least 10 cm away from wall.
- Keep the equipment through voltage stabilizer.
- Keep vaccines neatly with space between stacks for circulation of air.
- Keep the equipment locked and open only when it is necessary.
- Defrost periodically.
- Supervise the temperature record.
- If vaccines are in carton make holes on side of the carton for cold air circulations.



Don'ts

- Do not keep any other things other than vaccine in these boxes.
- Do not store any other drug.
- Do not keep drinking water or food in them.
- Do not keep more than 1 month requirements in PHC
- Do not keep expired date vaccines.

Vaccine Storage Guide

Proper REFRIGERATOR Temperatures

Refrigerate anthrax, DTaP, DT, Td, Tdap, hepatitis A and B, Hib, HPV, influenza, IPV, Japanese encephalitis, meningococcal, pneumococcal, rabies, rotavirus, typhoid, and yellow fever.



Proper FREEZER Temperatures

Freeze MMR, MMRV, varicella, and zoster. Don't freeze liquid vaccines!



ADVERSE EVENTS FOLLOWING IMMUNIZATION

Classification of Adverse Events following Immunization

Table 6: Types of immunization reactions

Type of reaction	Explanation
Vaccine reaction	Event caused or precipitated by the vaccine when given correctly, caused by inherent properties of vaccine
Program error	Event caused by an error in the vaccine preparation, handling or administration
Coincidental	Events that happens after immunization but not caused by the vaccine-a chance of association
Injection reaction	Events from anxiety about or pain from the injection itself rather than the vaccine
Unknown	Events cause cannot be determined





64. Which of the following is considered as primary prevention strategy?

- Early identification
- Reduction of disability
- Control of spread of disease
- Early treatment of disease

65. Primary prevention of communicable diseases can be attained by:

- | | |
|-----------------|---------------------|
| a. Quarantine | b. Strict isolation |
| c. Immunization | d. Antibiotics |

INTRODUCTION TO EPIDEMIOLOGY

66. Father of Indian Surgery is:

- Dhanvantari
- Charaka
- Sushruta
- Atreya

67. Outbreak of disease in the community in excess the normal expectation is: (RAK MSc 2018)

- | | |
|-------------|-------------|
| a. Epidemic | b. Pandemic |
| c. Sporadic | d. Endemic |

Explanation:

- Epidemic**- Epidemic is the outbreak of particular diseases in the community in excess form from the normal expectation.
- Pandemic**- Pandemic is the outbreak of the disease from one country to another country means all over the world.
- Sporadic**- Sporadic is the prevalence at intervals of a single particular disperses case of a disease.
- Endemic**- A continuous presence of a particular disease with in a particular geographical area is called as endemic.

68. The constant presence of infection in a given geographical area without any external input is known as:

- Epidemic
- Endemic
- Pandemic
- Sporadic

Explanation: An infection is said to be endemic in a population when that infection is maintained in the population without the need for external inputs. Epidemic is the rapid spread of infectious disease to a large number of people in a given population within a short period of time.

- A pandemic is an epidemic of world-wide proportions.
- Sporadic refers to diseases that is occurring at irregular intervals or only in a few places

69. Sporadic means:

- Sudden outbreak of disease in a given area.
- Infectious disease that has spread through human populations across a large region; for instance, multiple continents, or even worldwide
- Disease occurs at irregular intervals or only in few places is scattered in isolated manner
- Constant presence of infection in a given geographical area without any external input

Explanation: Option a is epidemic, option b is pandemic, option c is sporadic, option d is endemic.

70. Outbreak of disease in bird population is:

- Epidemic
- Endemic
- Zoonoses
- Epornithic

Explanation: Outbreak of disease in bird's population is epornithic. Zoonoses means a disease which transmits from animal to human being. Epidemic is the sudden outbreak of disease. Endemic means constant presence of infection in a geographical area without external input.

71. Quarantine stands for:

- Time period between infection and confirmatory diagnosis
- Time period between diagnosis and initiation of treatment
- Time period between infection and multiplication of organism
- Longest incubation period

Explanation: A period of time during which a vehicle, person, or material suspected of carrying a contagious disease is detained at a port of entry under enforced isolation to prevent disease from entering a country. There is restriction on healthy contacts. Time of restriction is a longest incubation period.

72. Father of epidemiology is:

- | | |
|---------------------|------------------|
| a. John Snow | b. Joseph Lister |
| c. Karl Landsteiner | d. Robert Hook |

Explanation: John Snow is the father of epidemiology.

73. The constant presence of a disease or infection within a given geographic area is called as:

- | | |
|-------------|-------------|
| a. Pandemic | b. Sporadic |
| c. Epidemic | d. Endemic |

Explanation: A disease that is endemic is found in a certain geographic region or in a specific race of people.

74. Tear out by roots is the literal meaning of:

- | | |
|----------------|-----------------|
| a. Elimination | b. Eradication |
| c. Isolation | d. Transmission |

Explanation: Tear out by roots means eradication of the disease.

75. A person with no sign of disease but may transmit, it is called: (ESIC Chennai May 2012)

- An allergic person
- Immune person
- A resistant person
- A carrier person

76. Decrease in the incidence of a disease to a level where it ceases to be a public health problem is: (RRB Feb 2012)

- | | |
|-----------------|----------------|
| a. Elimination | b. Control |
| c. Surveillance | d. Eradication |

77. Basic unit of the society: (RRB Feb 2012)

- | | |
|---------------|-----------|
| a. Individual | b. Family |
| c. PHC | d. County |

78. All are true about incidence; EXCEPT:

- Denominator includes population at risk
- Numerator includes number of new cases
- Does not include unit of time
- It is a rate



Ans.

- c
- c
- c
- a
- b
- c
- d
- d
- a
- d
- b
- d
- b
- b
- c



79. Time interval between primary and secondary case is known as:

- Extrinsic incubation period
- Intrinsic incubation period
- Serial interval
- Window period

80. 'Silent epidemic' of the century is:

- Coronary artery disease
- Chronic liver disease
- Chronic obstructive lung disease
- Alzheimer's disease

81. Time between infection and maximum infectivity is known as:

- Incubation period
- Serial interval
- Generation time
- Communicable period

82. The obligate refers to the:

- Host in which the parasite remains asexual
- Temporary host
- Only host
- Multiple hosts

Explanation: An obligate host means the single host in which complete life cycle of infecting agent completes. Without this host life cycle of the parasite will not complete.

83. Transport host is one in which:

- Parasite passes its sexual stage
- Parasite remains asexual
- Organism remains alive but does not undergo development
- Life cycle is not complete.

Explanation: Transport host is also known as paratenic host. In this the parasite will infect the host but not undergo any development. One that is used until the appropriate definitive host is reached, but is not necessary to completion of the life cycle of the parasite.

84. Incubatory carrier is:

- A person capable of transmitting an infectious agent to others during the incubation period of the disease
- A person who is continue to shed disease causing agent during the period of recovery
- A person or other organism that has contracted an infectious disease, but who displays no symptoms. Although unaffected by the disease themselves, carriers can transmit it to others.
- A person who carry micro organism

Explanation: Option a is incubatory carrier, option b is convalescent carrier, option c is healthy carrier or asymptomatic carrier, option d is the simple definition of carrier.

85. An infection which is present in an individual but, not sufficient to result in a disease is called as:

- Latent infection
- Clinical infection
- Subclinical infection
- Secondary infection

Explanation: Infection means a successful entry, development and or multiplication of organism in the body of living being, but if the organism fails to cause signs and symptoms of disease in the individual, it is called as sub clinical infection.

86. Spread of communicable disease across a large region, country to country is referred to:

- Endemic
- Epidemic
- Episodic
- Pandemic

Explanation: Spread of disease among larger population is known as pandemic. Endemic refers to disease or condition that is regularly found among particular people or in a certain area.

Epidemic refers to a widespread occurrence of an infectious disease in a community at a particular time. Episodic refers to occasional.

87. Window period means:

- Time period between infection and detection of antibodies
- Time period between infection and first sign and symptom
- Time period between diagnosis and treatment
- None of the above

Explanation: The window period is time between potential exposure to HIV infection and the point when the test will give an accurate result. During the window period a person can be infected with HIV and infectious but have a negative HIV test. The window period for a 4th generation antigen/antibody test is four weeks.

88. Time period between infection and detection of antibodies against HIV is known as:

- Acute Infection
- Chronic Infection
- Active HIV
- Window Period

Explanation: The window period is time between potential exposure to HIV infection and the point when the test will give an accurate result. During the window period a person can be infected with HIV and infectious but have a negative HIV test. The window period for a 4th generation antigen/antibody test is four weeks.

89. Quarantine period should be:

- Minimum incubation period
- Maximum incubation period
- Period of communicability
- Median incubation period

MORTALITY RATES & RATIOS

90. Denominator while calculating maternal mortality rate is:

- Total number of deliveries
- Total number of live birth
- Total number of maternal death
- Midyear population

Explanation: $MMR = \frac{\text{Total number of female death due to complications of pregnancy, child birth or within 42 days of delivery from puerperal causes in an area during a given year}}{\text{Total number of live birth}}$

91. Commonest cause of neonatal morbidity in India is:

(RRB SSNE 2015)

- Diarrheal diseases
- Birth injuries
- Congenital anomalies
- Prematurity and low birth weight



Ans.

- | | |
|-----|---|
| 79. | c |
| 80. | d |
| 81. | c |
| 82. | c |
| 83. | c |
| 84. | a |
| 85. | c |
| 86. | d |
| 87. | a |
| 88. | d |
| 89. | b |
| 90. | b |
| 91. | d |

**Explanation:**

Birth rate = 30/1000

In 5000 population, no. of live birth = $(30/1000) \times 5000 = 150$

No. of death before 1 year of age = 15

IMR = $(\text{No. of death of children less than one year of age} / \text{No. of live birth in the same year}) \times 1000$

IMR = $(15/150) \times 1000 = 100$

110. Infant mortality rate (IMR) is defined as number of deaths of infants under age one per:

- 1000 births
- 1000 live births
- 1000 midyear population
- 1000 women of reproductive age group

111. To achieve net reproduction rate of 1, the couple protection rate should be: (RRB Feb 2012)

- 50%
- 65%
- 55%
- 60%

112. Annual Under five deaths globally reported are:

- 6 million
- 8 million
- 10 million
- 12 million

113. Physical quality of life is a consolidated index of:

- MMR, IMR and life expectancy at age 5 years
- Infant mortality, life expectancy at age one and literacy
- IMR, MMR and life expectancy at age 14 years
- MMR, NRR and life expectancy at age of 60 years

114. Perinatal mortality rate includes:

- 37 weeks to 1st week after birth
- 28 weeks to 1st week after birth
- 20 weeks to 1st week after birth
- Before preterm labor

115. All of the following are common cause of postneonatal infant mortality in India; EXCEPT:

- Tetanus
- Malnutrition
- Diarrheal diseases
- Acute respiratory infection

116. Present IMR in India as per the latest data is:

- 34 per 1000 live births
- 36 per 1000 live births
- 39 per 1000 live births
- 40 per 1000 live births

117. Incidence of chromosomal abnormalities in India is:

- 1-2 per 1000 live births
- 2-3 per 1000 live births
- 5-6 per 1000 live births
- 8-9 per 1000 live births

118. Major cause of perinatal mortality is:

- Malnutrition
- Congenital anomalies
- Birth asphyxia
- Both a and b

119. Leading cause of neonatal mortality in India is:

- Infections
- Birth asphyxia/trauma
- Diarrhea
- Prematurity and congenital malformation

120. The highest rate of infant mortality in India is reported from:

- Madhya Pradesh
- Bihar
- Uttar Pradesh
- Orissa

121. All are direct causes of maternal mortality in India; EXCEPT:

- Cardiac disease
- Eclampsia
- Hemorrhage
- Abortion

122. Mainly included in child survival index:

- MMR
- IMR
- Mortality between 1 and 4 years of age
- Under 5 mortality

123. Perinatal death includes:

- After 28 weeks of pregnancy
- Within seven days after birth
- Both a and b
- None of the above

124. Most common cause of perinatal mortality is:

- Prematurity
- Birth injury
- Metabolic
- Congenital

125. Most common cause of death in children <5 years age:

- Respiratory infection
- Diarrhea
- Prematurity
- Accidents

INCIDENCE AND PREVALENCE OF DISEASE

126. Kaplan Meier method is for:

- Survival
- Incidence
- Prevalence
- Frequency

127. Prevalence is a:

- Rate
- Ratio
- Proportion
- Mean

128. Other name for Vitamin B12 is:

- Ascorbic acid
- Cyanocobalamin
- Thiamine
- Riboflavin

129. Number of current cases (new and preexisting) at a specified point in time divided by population at the same specified point in time is referred as:

- Point prevalence
- Period prevalence
- Lifetime prevalence
- Prevalence estimate

130. Number of current cases (new and preexisting) over a specified period of time divided by average or mid-interval population:

- Point prevalence
- Period prevalence
- Lifetime prevalence
- Total prevalence

131. The number of new cases occurring in a defined population during a specified period of time is known as:

- Incidence
- Point prevalence
- Period prevalence
- Current prevalence

EPIDEMIOLOGICAL METHODS

132. A village was divided into 5 sub-groups, for a survey. The sample was drawn by selecting people randomly from these subgroups. What type of sampling was done?

- Simple random sampling
- Stratified random sampling
- Cluster sampling
- Systematic random sampling

**Ans.**

110. b
111. d
112. a
113. b
114. b
115. a
116. a
117. c
118. c
119. d
120. a
121. a
122. d
123. c
124. a
125. a
126. a
127. c
128. b
129. a
130. b
131. a
132. b

**Ans.**

133. d
134. a
135. c
136. a
137. d
138. c
139. c
140. b
141. a
142. d
143. b
144. a
145. d
146. b
147. b
148. b
149. a
150. d
151. b
152. c
153. d
154. b
155. c
156. b
157. b
158. c

- 133. In a research study, first schools are sampled, then sections and finally student. This type of sampling is known as:**
- Stratified sampling
 - Simple random sampling
 - Cluster sampling
 - Multi stage sampling
- 134. Stratified sampling is ideal for:**
- Hetrogeneous data
 - Homogenous data
 - Both a and b
 - None of these
- 135. Simple random sampling is ideal for:**
- Vaccinated people
 - Heterogeneous population
 - Homogenous population
 - All of the above
- 136. Degree of freedom for 2×2 contingency table is:**
- 1
 - 2
 - 3
 - 4
- 137. Chi square test is for:**
- Standard error of mean
 - Standard error of proportion
 - Difference between population means
 - Difference between population proportion
- 138. Not required for Chi square test:**
- Null hypothesis
 - Degree of freedom
 - Means in different groups
 - Proportion in different groups
- 139. Degree of freedom of contingency table with 3 rows and 6 columns is:**
- 2
 - 3
 - 10
 - 18
- 140. Chi square test 5 rows/4 columns, degree of freedom is:**
- 9
 - 12
 - 16
 - 20
- 141. If the distribution of Intra-ocular pressure (IOP) seen in 100 glaucoma patients has an average 30 mm with a SD of 1.0, what is the lower limit of the average IOP that can be expected 95% of times?**
- 29
 - 26
 - 32
 - 259
- 142. Which is the best distribution to study the daily admission of head injury patients in a trauma care center?**
- Normal distribution
 - Binomial distribution
 - Uniform distribution
 - Poisson distribution
- 143. In the left skewed curve, true statement is:**
- Mean = Median
 - Mean < Mode
 - Mean > Mode
 - Mean = Mode
- 144. For a negatively skewed data mean will be:**
- Less than median
 - More than median
 - Equal to median
 - One
- 145. Confidence limit is calculated by using:**
- Mean and standard error
 - Mean and standard deviation
 - Median and standard deviation
 - Median
- 146. A child's weight for height is more than 2SD of mean, and his height for age is less than 2SD of mean. He is classified as:**
- Normal
 - Stunted
 - Wasted
 - Wasted and stunted
- 147. In WHO "Road to Health" chart, upper and lower limit of represents:**
- 30 percentile for boys and 3 percentile for girls
 - 50 percentile for boys and 3 percentile for girls
 - 30 percentile for boys and 5 percentile for girls
 - 50 percentile for boys and 5 percentile for girls
- 148. If the birth weight of each of the 10 babies born in a hospital in a day is found to be 2.8 kg, then the standard deviation of this sample will be:**
- 2.8
 - 0
 - 1
 - 0.28
- 149. Most reliable measures of central tendency in a normally contributed data is:**
- Mean
 - Median
 - Mode
 - Standard deviation
- 150. Mean, Median and Mode are:**
- Measures of dispersion
 - Measures of association between two variables
 - Test of significance
 - Measures of central tendency
- 151. Most frequently occurring value in a group of data:**
(TNPSK 2015)
- Mean
 - Mode
 - Median
 - Standard deviation
- 152. Which type of variable "Social Class" is, if it has four categories-I to V and Class I is the highest social class and Class V is the lowest?**
- Dichotomous
 - Nominal
 - Ordinal
 - Interval
- 153. A physician, after examining a group of patients of a certain disease, classifies the condition of each one as 'Normal', 'Mild', 'Moderate' or 'Severe'. Which one of the following is the scale of measurement that is being adopted for classification of the disease condition?**
- Normal
 - Interval
 - Ratio
 - Ordinal
- 154. In a study following interpretation are obtained: Satisfied, Very satisfied, Dissatisfied. Which type of scale is this?**
- Nominal
 - Ordinal
 - Interval
 - Ratio
- 155. All of the following are example of nominal scale; EXCEPT:**
- Race
 - Sex
 - Body weight
 - Occupation
- 156. Histogram is used to present which kind of the data:**
- Nominal
 - Continuous
 - Discrete
 - None of the above
- 157. The best graphic representation of frequency distribution of data gathered of a continuous variable is:**
- Simple bar
 - Histogram
 - Line diagram
 - Multiple bar
- 158. Trends can be represented by:**
- Scatter diagram
 - Bar diagram
 - Line diagram
 - Pie chart



SYNOPSIS

INTRODUCTION

- **Mental health nursing** is a specialized area of nursing practice that deals with promotion of mental health, prevention of mental illness, care and rehabilitation of mentally ill individuals both in hospital and community.
- In **1943**, mental health nursing course was first started for male nurses.
- In **1965**, **Indian Nursing Council** included psychiatric nursing as a compulsory course in the BSc Nursing program.
- In **1967** **TNAI**, formed a separate committee for mental health nursing to improve the perception of mental health nursing as well as to set guidelines for nursing teachers to conduct theory classes and clinical training in psychiatric nursing.
- In **1976**, **Masters in Psychiatric Nursing** was first started at **RAK College of Nursing, New Delhi**.

MENTAL HEALTH

- Mental health is an adjustment of human beings to the world and to each other with maximum effectiveness and happiness.
- Mental health is an equilibrium of body, mind and spirit with the environment.

MENTAL ILLNESS

- Mental illness is maladjustment in living. It produces a disharmony in the person's ability to meet human needs comfortably or effectively and to function within a culture.
- Mental illness is health condition involving changes in emotion, thinking and behavior (or a combination of these).

Mental Healthcare Act 2017

- The **Indian Mental Healthcare Act 2017** replaced the Mental Health Act 1987.
- **Mental Healthcare Act 2017 (MHA 2017)** received presidential consent on April 7th, **2017** and replaced the **1987 Act**.

Salient Features of MHA 2017

- **Decriminalization of suicide attempt:** This Act has overturned **309 Indian Penal Code**. The MHA 2017 decriminalizes suicide attempt by mentally ill person.
- **Rights of persons with mental illness**
 - Every person will have the right to access mental healthcare services.
 - Protect person with mentally ill from inhuman treatment.
 - Mentally ill patients to have access to free legal services and right to complain about shortcoming of provision of treatment.
 - **Advance directive:** Empowers a mentally ill person to have the right to make an advance directive toward the way he/she wants to be treated.
- The government has to set up **Central Mental Health Authority** at national level and **State Mental Health Authority** at state level.
- The Act outlines the process of admission, treatment and discharge of patients.
- **No ECT** therapy without use of muscle relaxants.
- **No ECT** therapy for minors.
- **Financial Punishment:** Up to 6 months of imprisonment or ₹10,000 or both for violating of provisions of MHA 2017. Repeat offenders may face up to 2 years imprisonment or fine of ₹50,000 – 5,00,000 or both.
- **Reception order:** Refers to an order for admission and detention of a mentally ill person in a psychiatric hospital.



Key Points

- The term 'Psychiatry' was coined by **Christian Reil**.
- **Linda Richards** is considered as **First Psychiatric Nurse**.
- **Sigmund Freud** is the father of **Modern Psychiatry**.
- **Freud's model of development** which comprises 'id, ego and superego' is called **Structural Model**.
- **World Mental Health Day** is observed on **10th October**.
- The **Indian Lunacy Act** was passed in the year **1912**.
- The **Indian Mental Health Act** was passed in the year **1987**.
- **Mental Health Act 2017** decriminalizes suicide attempt by mentally ill person.



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PSYCHOSOCIAL THERAPIES

Various therapies are used to relieve patient's symptoms and help him/her to understand and modify conduct and to lead a well-adjusted life.

Psychoanalytical Therapy

In this, focus is on the cause of the problem, which is buried somewhere in the unconscious. The therapist tries to take the patient into the past in an effort to determine where the problem began. Techniques used are free association, dream analysis, hypnosis, catharsis and abreaction therapy.

Individual Psychotherapy

It is a method of bringing about change in a person by exploring his or her feelings, attitudes, thinking and behavior. It is one to one relationship of therapist with patient.

Indications

- Stress-related disorder
- Alcohol and drug dependence
- Sexual disorders
- Marital disharmony

Behavioral Therapies

Behavioral therapy assumes that the maladaptive behavior can be corrected through provision of learning experiences.

Goal

- To modify maladaptive behavior by reinforcing adaptive behaviors

Principles

- **Theory of Classical Conditioning:** Learning by association. (remember dog-saliva experiment)
- **Theory of Operant Conditioning:** Learning by reinforcement (rewards) and punishment. [Remember Rat – lever – food experiment]
- Social learning theory
- Cognitive Behavioral Therapy

Indications

- Social phobia
- Obsessive Compulsive Disorder (OCD)
- Post-Traumatic Stress Disorder (PTSD)
- Eating disorder
- Substance use
- Depression, BPAD, Schizophrenia, Autism

Behavior Therapy Techniques

Systemic Desensitization

- Developed by **Joseph Wolpe**

- **Steps**
 - Relaxation Training → Hierarchy Construction of anxiety provoking situation → Desensitization of Stimulus
- **Appropriate technique for**
 - Phobic anxiety disorder
 - Anxiety disorder
 - Obsessive compulsive disorder (OCD)
 - Certain sexual disorder

Flooding or Implosion

- A person is exposed directly to the stimulus (fearing object) in the most immediate and unavoidable way.
- No grading or relaxation
- Suitable to treat phobia
- Not suitable for client with heart disease

Shaping

- Based on operant conditioning principle
- Client's behavior leading to the desired behavior is rewarded
- Suitable for speech therapy in Autistic Child

Extinction

- Reinforcement that is provided for problem behavior is discontinued in order to eliminate occurrences of these types of problem behaviors. **E.g.:** Extinction in temper tantrum

Token Economy

- It is an operant conditioning technique
- 'Token' is distributed to appreciate desired (target) behavior
- The token can be later exchanged for privileges such as food, etc.

Restitution/Over-Correction

- Used to treat disruptive behavior
- A person engaged in disruptive behavior is asked to restore the situation much better than before. **E.g.:** A patient who urinated in the ward will be asked to clean the dirty area and also asked to mop the entire ward.

Time Out

- It is an aversive stimulus/punishment in which the client is isolated from the environment where he/she exhibited unacceptable behavior.
- This is to prevent reinforcement from attention of others.

Exposure and Response Prevention (ERP)

- Most important type of Cognitive Behavior Therapy (CBT) for OCD
- **Exposure:** Encourage client to expose himself/herself to the images, thoughts, objects or situations that make obsessions.



Key Points

- Systemic desensitization is developed by Joseph Wolpe.
- Systemic desensitization is useful for phobic anxiety disorder, OCD and certain sexual disorder.
- Flooding or implosion is useful therapy for phobia.
- Shaping is suitable for speech therapy in autistic child.
- Extinction technique is useful in temper tantrum.
- Exposure and response prevention (ERP) is the most important type of Cognitive Behavior Therapy (CBT) for OCD.
- Brief Cognitive Behavioral Therapy (CBT) focuses on solving current problems. It focuses on 'here and now' approach.
- Aversion therapy is useful alcoholism, impulsive behavior, and paraphilias.

Practice Question

3. A 30-year-old male patient complains of an intense, overwhelming fear of driving a bike. The patient does not go for shopping or job unless someone transports him. The fear has disrupted all elements of the patient's life. He has few social contacts. Which of the following is the most appropriate treatment plan for this patient?

- Flooding.
- Assertiveness training.
- Systematic desensitization
- Reminiscence therapy

Ans. (c) Systematic desensitization

- **Response prevention:** Encourage client not to do compulsive act after the obsession and anxiety triggered by the exposure.

Aversion Therapy

- Punishment (noxious stimuli) is presented immediately after exhibiting undesired behavior.
- Noxious stimuli can be Electric shock, substance that induce vomiting, social disapproval, corporeal punishment.
- Useful for Alcoholism, impulsive behavior, and paraphilias.

Social Skill Training

- Teach the client with verbal and nonverbal behaviors to improve social interactions

Assertiveness Training

- Assertive responses promote positive sense of respect for self and others
- Assertive training helps empowering the client in terms of human interactions

Cognitive Therapy

- It focuses on how patients think about themselves and their world, make change in current ways of thinking and behavior. It helps to modify the thinking pattern and develop right thinking.

Indications

- Anxiety, eating disorders
- Personality disorders
- Suicidal thoughts or attempts
- Sexual disorders

Family Therapy

- It is used when individual's psychiatric symptoms are inseparably related with the family in which he lives. Thus the focus of the treatment is not the treatment alone but also the family.

Indications

- Family problems or marital maladjustment

Behavior Therapy

- A trained professional helps a patient to correct the existing maladaptive behavior pattern by application of principles of learning.

Indications

- Specific phobias
- Alcohol abuse
- Paraphilias
- Homosexuality
- Transvestism

- Obsessions
- Compulsions

Milieu Therapy

- **Battleheim'** coined the term Milieu therapy
- The word "milieu" is French word means "middle". English translation of the word is surroundings or environment.
- Therapy involving the milieu or the environment may be called milieu therapy, therapeutic community or therapeutic environment.
- The goal of milieu therapy is **to manipulate the environment** so that all aspects of the client's hospital experience are considered therapeutic.
- Within this milieu, the client is expected to learn adaptive coping, interaction and relationship skills
- Key concepts of milieu therapy
 - **Containment:** Process of providing safety and security
 - **Validation:** Process that affirms patient individuality.
 - **Structured interaction:** Staff members approach the client in a consistent manner.
 - **Open communication:** Staff and patient willingly share information.
- **Programs within milieu**
 - Client government
 - Work related activities
- Some of the scales for evaluation of therapeutic environment includes Behavioral mapping by **Ittleson, Rivlin,** and **Proshansky,** Ward atmosphere scale by **Moos.**
- **Advantages**
 - The patient learns to adopt an acceptable behavior, decision making and leadership skills.
 - Client becomes socio centric
- **Disadvantages**
 - Role blurring between staff and patient
 - Patient may find transition to community difficult
 - Conflict resolution is needed as part of the staff's skills

ICD 10 CLASSIFICATION OF PSYCHIATRIC DISORDERS

Introduction

- ICD-10 is the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD), a medical classification list by the World Health Organization (WHO).
- Chapter V of the ICD 10 Classifies of Mental and Behavioral Disorders



Key Points

- The goal of milieu therapy is to manipulate the environment so that all aspects of the client's hospital experience are considered therapeutic.
- Concepts of milieu therapy include containment, **validation, structured interaction, and open communication.**
- Cognitive Behavior Therapy (CBT) is the treatment of choice for bulimia nervosa and for binge-eating disorder
- CBT is found to be effective in the treatment of PTSD.
- Release of feelings that takes place by talking about an emotionally charged areas is known as abreaction.

Practice Question

4. All of the following are true about psychoanalytic therapy, except
- Insight-oriented therapy
 - Emphasize operant conditioning and modeling
 - Focused on past
 - Consider disorders as arising from unresolved conflicts

Ans. (b) Emphasize operant conditioning and modeling





List of Categories

- **F00-F09:** Organic, including symptomatic, mental disorders
- **F10-F19:** Mental and behavioral disorders due to psychoactive substance use
- **F20-F29:** Schizophrenia, schizotypal and delusional disorders
- **F30-F39:** Mood [affective] disorders
- **F40-F48:** Neurotic, stress-related and somatoform disorders
- **F50-F59:** Behavioral syndromes associated with physiological disturbances and physical factors
- **F60-F69:** Disorders of adult personality and behavior
- **F70-F79:** Mental retardation
- **F80-F89:** Disorders of psychological development
- **F90-F98:** Behavioral and emotional disorders with onset usually occurring in childhood and adolescence
- **F99-F99:** Unspecified mental disorder

Important Psychiatric Disorders and its Classification Codes

- **F10:** Mental and behavioral disorders due to use of **alcohol**
- **F11:** Mental and behavioral disorders due to use of **opioid**
- **F20:** Schizophrenia
- **F30:** Manic episode
- **F31:** Bipolar Affective Disorder (BPAD)
- **F32:** Depressive Episode
- **F40:** Phobic Anxiety Disorder
- **F42:** Obsessive Compulsive Disorder
- **F44:** Dissociative Disorder
- **F50:** Eating disorders
- **F52:** Sexual dysfunction
- **F60:** Specific Personality disorders
- **F70:** Mild Mental retardation
- **F71:** Moderate Mental retardation
- **F72:** Severe Mental retardation
- **F73:** Profound Mental retardation
- **F80:** Specific developmental disorders of speech and language



Key Points

- ICD-11 has been adopted by the Seventy-second World Health Assembly in May 2019 and comes into effect on 1 January 2022
- International Classification of Diseases is published by World Health Organization (WHO).
- Diagnostic and Statistical Manual (DSM) classification of mental disorders is published by American Psychiatric Association.

- **F90:** Hyperkinetic disorder
- **F95:** Tic disorders

GENERAL PSYCHOPATHOLOGY

Disorders of Consciousness

- **Consciousness** is awareness of the self and the environment
- **Quantitative changes of consciousness** mean reduced vigility (alertness):
 - **Somnolence:** State of strong desire for sleep, or sleeping for unusually long periods
 - **Stupor:** A state of near-unconsciousness or insensibility
 - **Coma:** A deep state of prolonged unconsciousness in which a person cannot be awakened
- **Qualitative changes of consciousness** mean disturbed perception, thinking, affectivity, memory and consequent motor disorders:
 - **Delirium (confusional state):** Characterized by disorientation, distorted perception, enhanced suggestibility, misinterpretations and mood disorders
 - **Obnubilation (twilight state):** Starts and ends abruptly, amnesia is complete; the patient is disoriented, his acting is aimless, sometimes aggressive, hard to understand. The person may be Stuporous or Delirious
- **Hypnosis:** Artificially incited change of consciousness
- **Syncope:** Short-term unconsciousness

Disorders of Perception

- **Illusions:** Refers to an instance of a wrong or misinterpreted perception of a sensory experience (sensory stimuli).
- **Pseudoillusions:** Distorted perception of objects which may occur when the general level of sensory stimulation is reduced
- **Hallucination:** Perception without any obvious stimulus



Key Point

The traditional division between neurosis and psychosis that was evident in ICD-9 (deliberately left without any attempt to define these concepts) has not been used in ICD-10.

Practice Question

5. A 45-year-old male client with 8 years history of alcohol abuse is admitted for deaddiction treatment. The nurse in the unit is aware the following symptoms are associated alcohol withdrawal delirium, except
- Hallucinations, disorientation, hypertension, anxiety
 - Ataxia, lethargy, hypotension, hunger
 - Hypotension, lethargy, Stupor, dystonia
 - Muscle rigidity, alertness, Coarse hand tremors, hypothermia

Ans. (a) Hallucinations, disorientation, hypertension, anxiety



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**Table 7:** Types of hallucination with their key features

Types of hallucination	Key points
Auditory hallucination (acousma)	Person hears non-existent sounds. Most common type of hallucination. Common in schizophrenic patient.
Visual hallucination	Person sees something that does not exist Common in acute organic brain stem conditions
Olfactory hallucination (Phantosmia)	Person smells odors that do not exist. Odors are usually unpleasant. Can occur in schizophrenia and organic states. It can also be caused by Epilepsy
Gustatory hallucination	Person tastes something that is not present Seen in depression
Tactile hallucination (or deep somatic)	Person senses that they are being touched when they are not. Commonly associated with substance use such as cocaine or amphetamine
Kinetic hallucination	Sensation of flying or moving the body or a part of body. Also known as motor hallucination.
Delusional zoopathy	Delusional belief + feeling of animals/insects crawling in the body
Pseudohallucinations	Patient can distinguish them from reality

Disorders of Thinking/Thought

Quantitative (Formal) Disorders of Thinking

- **Pressure of thought:** Ideas arise very rapidly and in great variety, passing through the mind quickly. It may be experienced in mania or schizophrenia.
- **Poverty of thought:** The mental state of being devoid of thought and having a feeling of emptiness.
- **Thought blocking:** A person stops speaking suddenly and without explanation in the middle of a sentence. Common in Schizophrenia.
- **Flight of ideas:** Rapid speech with frequent shifts in topic with no association between topics.
- **Perseveration:** Repetition of a particular response (such as a word, phrase, or gesture) regardless of the absence or cessation of a stimulus

- **Verbigeration:** Obsessive repetition of random words. It is similar to perseveration, in which a person repeats words in response to a stimulus.
- **Loosening of associations:** Series of ideas are presented with loosely apparent or completely in apparent logical connections.
- **Word salad:** Confused or unintelligible mixture of seemingly random words and phrases
- **Neologisms:** A newly-created word whose meaning is unknown to others

Qualitative Disorders of Thought (Content Thought Disorders)

Delusion is defined as fixed, false belief that does not change even when a person is presented with conflicting evidence.

Table 8: Types of delusion

Types of delusion	Explanation
Delusion of persecution	Patient thinks that people are planning to kill or harm him/her
Delusion of grandiosity	Patient feels more superior and powerful than he really is
Delusion of infidelity	Patient thinks that his/her spouse is unfaithful on him/her. Feeling of being cheated by spouse.
Delusion of Nihilism	Patient feels that things do not exist (everything including self) and a sense that everything is unreal.

Concerning the Possession of Thoughts

- Thought insertion
- Thought withdrawal
- Thought broadcasting



Key Points

- Auditory hallucination is the most common form of hallucination in schizophrenics.
- Olfactory hallucination occurs due to neurological damage to olfactory system. **It can also be caused by Epilepsy.**
- Visual hallucination is common in acute organic brain stem conditions.
- Tactile hallucination is commonly associated with substance use such as cocaine or amphetamine.
- Circumstantiality is a disorder of thought in which thinking proceeds slowly with many unnecessary trivial details, but finally the point is reached.
- Persecutory delusion and/or suspiciousness is common in paranoid schizophrenia.
- Delusion of grandiosity is common in Mania





Obsessions (Obsessive Thought)

Obsessions (obsessive thought) are recurrent persistent thoughts, impulses or images entering the mind despite the person's efforts to exclude them. Obsessive phenomena in acting (usual as senseless rituals – cleaning, counting, dressing) are called **compulsions**.

Disorders of Memory

Types of Memory

- **Short-term memory (working memory):** For verbal and visual information, retained for 15–20

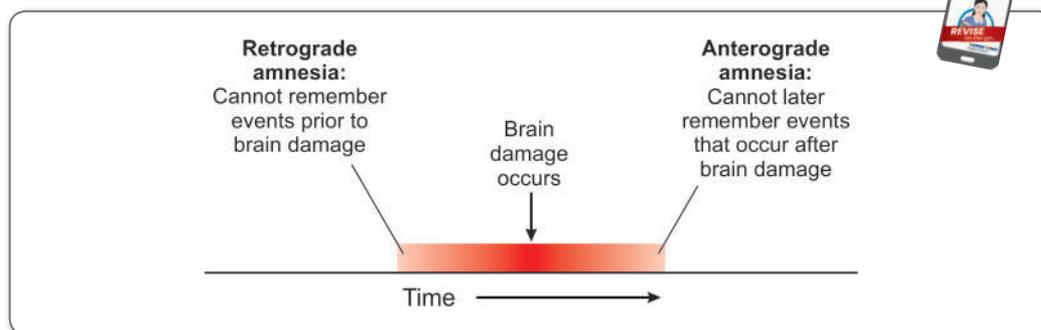


Figure 2 ■ Types of amnesia

- **déjà vu:** It comprises the feeling of having experienced a current event in the past, although it has no basis in fact.
- **Jamais vu:** It is opposite to déjà vu. The phenomenon of experiencing a situation that one recognizes in some fashion, but that nonetheless seems very unfamiliar.
- **Confabulation:** Gaps in memory are unconsciously filled with fabricated, misinterpreted, or distorted information.
- **Amnesic disorientation:** Characterized by disorientation particularly in time, impairment of immediate recall, loss of recent memory, retroactive loss of remote memory of varying extent and a tendency to confabulation.
- **Hypomnesia:** Abnormally poor memory of the past.
- **Hypermnnesia:** Unusual power or enhancement of memory, typically under abnormal conditions such as trauma, hypnosis, or narcosis.
- **Korsakoff's syndrome:** Occurs due to vitamin B1 (thiamin) deficiency. Memory problems are often preceded by ataxia.
- **Transient global amnesia:** It is characterized by a patient's inability to learn new material. Perception and personal identity are normal.

sec., low capacity, e.g. retaining phone number while dialing.

- **Long-term memory:** Wide capacity and more permanent storage, e.g. childhood memories, language vocabulary

Various disorders of memory are:

- **Amnesia:** Severe memory loss.
 - **Retrograde amnesia:** Cannot recall events that occurred prior to the brain trauma.
 - **Anterograde amnesia:** Cannot recall events that occurred after the brain trauma. Occurs due to failure to make permanent traces.



Key Points

- Confabulation is a symptom of various memory disorders in which made up stories fill in any gaps in memory.
- Unfamiliarity of familiar things is seen in *Jamais vu*.
- *Déjà vu* is a feeling of having already experienced the present situation.
- Recent memory loss is a feature of Alzheimer's disease.
- Separation of a thought or memory from its associated feeling or emotion is known as *Isolation*.
- **Amnesia:** Loss of memory
- **Agnosia:** Unable to recognize inanimate objects
- **Apraxia:** No recognition of object function
- **Aphasia:** Unable to speak

Motor Disorders

Motor disorders occur frequently in all kinds of mental disorders, especially in catatonic schizophrenia.

Quantitative

- **Hypoagility:** An overall lowering or deprivation of activities
- **Hyperagility:** Excessive activity.
- Agitated behavior

Qualitative

- **Mannerisms:** A habitual gesture or way of speaking or behaving
- **Stereotypies:** A motor disorder with onset in childhood involving repetitive, nonfunctional motor behavior (e.g., hand waving or head banging)
- **Posturing:** An abnormal involuntary flexion or extension of the arms, legs and or body parts.
- **Waxy flexibility:** The person is nearly or completely unresponsive to stimuli and remains immobile for long periods of time
- **Echopraxia:** Meaningless repetition or imitation of the movements of others





- **Negativism:** Seen in patients with catatonia. opposition or no response to instructions or external stimuli
- **Automatism:** Automatism is more or less coordinated, involuntary motor activity occurring during a state of impaired consciousness either in the course of or after an epileptic seizure and usually followed by amnesia.
- **Agitation:** A state of anxiety or nervous excitement
- **Tics:** Condition that involves brief, uncontrollable, spasm-like movements
- **Compulsions:** Compulsive acts can be defined as repetitious, purposeful physical or mental actions that the individual feels compelled to engage in a stereotyped manner.

ORGANIC MENTAL DISORDERS

These are behavioral or psychological disorders associated with transient or permanent brain dysfunction.

Dementia

It is an acquired global impairment of intellect, memory and personality without impairment at consciousness level. Sundown phenomena is also common in dementia.

Sundown phenomena is characterized by drowsiness, confusion and ataxia. Accidental falls may also occur at night when external stimuli such as light and interpersonal orienting cues are diminished.

Causes of Dementia

- Alzheimer's disease
- Vascular dementia
- Frontotemporal dementia (Pick's disease)
- Head trauma
- Parkinson's disease
- Huntington's disease

Symptoms According to Stages

Stage I: Early Stage (2 to 4 Years)

- Forgetfulness
- Declining interest in the environment
- Hesitancy in initiating actions
- Poor performance at work.

Stage II: Middle Stage (2 to 12 Years)

- Progressive memory loss
- Hesitates in response to questions
- Has difficulty in following simple instructions
- Irritable, anxious
- Wandering
- Neglects personal hygiene
- Social isolation.

Stage III: Final Stage (Several Weeks to Several Years)

- Marked loss of weight because of inadequate intake of food
- Unable to communicate
- Does not recognize family
- Incontinence of urine and feces
- Losses the ability to stand and walk
- Death is unusually caused by aspiration pneumonia.

Treatment

- Psychosocial therapy
- Symptomatic treatment
- Pharmacological treatment
 - Memantine is the drug of choice nowadays.
 - Tacrine hydrochloride (Cognex); rarely used due to potential side effect of hepatotoxicity
 - Donepezil hydrochloride (Aricept)
 - Antipsychotics such as risperidone and haloperidol
 - Benzodiazepines for insomnia and anxiety
 - Antidepressants for depression
 - Anticonvulsants to control seizures.



Key Points

- Presenile dementia occurs in younger person (<65 years). **Causes:** Alzheimer's disease, Pick's disease, Parkinson's disease.
- Senile dementia occurs after 65 years of age. **Cause:** Degenerative brain changes.
- In dementia, symptoms seem to worsen in the late afternoon and evening—a phenomenon termed sundowning.
- For a client with dementia, a complex task will be easier if it is broken down into series.



Key Points

- Mini mental status examination is used to assess cognitive impairment
- Minimize the sensory stimulation. The rooms should be free from distractions, quiet and away from the noise of any activity.
- Speak directly to the client in a low frequency range and enunciate clearly.
- Confusion and disorientation may increase at night.
- If the client is verbally upset, listen briefly give support, then change the topic.
- Provide simple group activities. Encourage the client for group activities that are familiar and simple to perform.
- Assist the client as needed to maintain the daily functions and adequate personal hygiene.
- A complex task will be easier for the client if it is broken down into series.
- Sundowning: Nocturnal episodes of confusion with agitation, restlessness.



#21

A patient with schizophrenia has potential to harm self as well as others in the ward. Which of the following is the most appropriate nursing intervention?

- Maintain low level of stimulation; be alert for signs of increasing anxiety and agitation
- Assess the nature of severity
- Apply mechanical restraints if necessary
- Ask the patient directly "have you thought about harming yourself or others"

Ans. (a) Maintain low level of stimulation; be alert for signs of increasing anxiety and agitation

Explanation: Always assess the schizophrenia patients for any suicidal attempts or to harm other persons in the ward. Create a safe environment for the patients, remove the sharp and harmful objects from the patient's sight. Assess the nature and severity of hallucinations periodically.

#22

A person who was wandering purposelessly around the roads, untidy, on examination he is found muttering to self and irritable sometimes. Which of the following disorder the patient may suffering from?

- Major depressive disorder
- Schizotypal personality disorder
- Obsessive compulsive disorder
- Chronic schizophrenia

Ans. (d) Chronic schizophrenia

Explanation: Chronic schizophrenia is defined as a severe mental disorder that affects how a person thinks, feels and behaves. Client with schizophrenia has lost touch with the reality. The symptoms of chronic schizophrenia include affective flattening, alogia, anhedonia, avolition and poor attention. These are the negative symptoms of schizophrenia having poorest prognosis.

#23

On family assessment, patient's family members show; critical, hostile and over involvement behavior toward patient. Document the attitude that the family is showing:

- Adequate support system
- Expressed emotions
- Care and concern toward patient
- Judgmental attitude toward patient

Ans. (b) Expressed emotions

Explanation: Expressed emotion is the critical and emotionally over-involved attitude that the family members show toward the client. This negative family atmosphere will lead to relapse of the symptoms and rehospitalization and also had significant effect on the course of illness.

#24

A patient with excited catatonia shows extreme excitement with rigidity, appears hyperthermic and dehydrated. The nurse documents this finding as:

- Pernicious catatonia
- Catatonic stupor
- Ecstasy
- Extremely excited catatonia

Ans. (a) Pernicious catatonia

Explanation: The clinical features of catatonic schizophrenia include loosening of associations, increase in speech production, increase in excitement, aggressiveness, restlessness, agitation, loosening of association. If the excitement becomes very severe and is accompanied by hyperthermia, dehydration, rigidity and can lead to death. It is called pernicious catatonia or acute lethal catatonia.

#25

Mr Suresh and Mr Mohan have close emotional bond. Mr Suresh experiences delusion of grandiosity (in actuality), after some time Mr Mohan also experiences the same symptoms as Mr Suresh. Which type of disorder the two are experiencing?

- Persistent delusional disorder
- Capgras syndrome
- Induced delusional disorder
- Acute and transient psychotic disorder

Ans. (c) Induced delusional disorder

Explanation: A delusional disorder shared by two closely related persons in which only one person is having genuine psychotic disorder, the other person is induced and mutually share the same delusion. It is popularly called folie à deux.

MOOD DISORDERS

#26

According to Sigmund Freud, loss of loved object and fixation in the oral sadistic phase of development leads to development of which disorder?

- Mania
- Schizophrenia
- Depression
- Phobia

Ans. (d) Depression

Explanation: According to Sigmund Freud, the oral stage is divided into two sub-phases. The first is oral incorporative phase (0 – 6 months). The oral incorporative behavior occurs first and involves the pleasurable stimulation of the mouth by other people and by food. Adults fixated at the oral incorporative stage are excessively concerned with oral activities such as smoking, drinking and kissing. The second oral behavior is oral sadistic phase which occurs during the painful, frustrating eruption of teeth. Persons fixated at this level are prone to excessive pessimism, hostility and aggressiveness.



#27

A patient is taking selective serotonin reuptake inhibitor for the treatment of depression and asks the nurse about the time lag for the maximum therapeutic affect to occur. The best response of the nurse is:

- a. Two Days
- b. One Week.
- c. Four Week
- d. Three weeks

Ans. (d) Three weeks

Explanation: SSRI will slow down the reabsorption of serotonin which helps to regulate the mood and anxiety. The maximum therapeutic response of the drug SSRI will take up to three weeks. So the nurse should educate the client that it will take three weeks for the maximum therapeutic response.

#28

A patient with mania states “Rock, clock, lock, mock”. The nurse documents this verbal expression as:

- a. Flight of ideas
- b. Word salad
- c. Clang Association
- d. Euphoria

Ans. (c) Clang Association

Explanation: Clang association is the disorder of stream of thought. It refers to the sequence of thought stimulated by the sound of previous word rather than by the meaning. It is mostly based on the rhyming of the word without the proper meaning of the word.

#29

A patient with suicidal ideation gives a written agreement to the health care team regarding not to harm himself and herself. Such type of contract is known as:

- a. No harm contract
- b. No suicide pledge
- c. No injury contract
- d. No suicide contract

Ans. (d) No suicide contract

Explanation: No suicide contract is a written agreement between the patient and the nurse that the patient will not to act on any suicidal impulses. It is considered as one of the forms of management for suicide.

#30

Although there is a risk of suicide in all patients with depression. The risk is higher in which of the following situation?

- a. Recovery from depression
- b. At peak of depression
- c. Being married women
- d. Female gender

Ans. (a) Recovery from depression

Explanation: The risk of suicide is more after the recovery from depression because the characteristic psychomotor retardation has improved and the patient has more energy to carry out the suicidal plans.

#31

A patient with mood disorder is getting discharge from hospital. The nurse educates the patient and family members about inclusion of good bowel regimen and high fiber diet, and increase fluid intake in lifestyle as medicines may cause constipation. Which medicine the patient is on?

- a. Lithium
- b. Carbamazepine
- c. Antidepressants
- d. Atypical antipsychotics

Ans. (c) Antidepressants

Explanation: One of the side effects of anti-depressants is constipation. So in order to avoid constipation the nurse should educate the client to follow good bowel regimen and high-fiber diet. The other autonomic side effects are dry mouth, mydriasis, urinary retention, orthostatic hypotension, impotence, delirium and aggravation of glaucoma.

#32

A nurse accepts free gifts from patient and develops personal or social relationship with the patient. Such act from the nurse will be called:

- a. Resistance
- b. Boundary violation
- c. Transference
- d. Counter- transference

Ans. (b) Boundary violation

Explanation: Boundary violation is defined as the nurse goes outside the boundaries of the therapeutic relationship and establishes a personal relationship with the patient, like she accepts gifts from the patient, hugs or having physical contact with patient, reveals personal information to the patient, etc.

#33

While conducting interview of a patient and after the patient's response, the nurse replies “I am Not sure what you mean. Could you please tell me about that again? Which technique of therapeutic communication the nurse is using?

- a. Seeking clarification
- b. Focusing
- c. Reflection
- d. Sharing perception.

Ans. (a) Seeking clarification

Explanation: Seeking clarification is a technique of therapeutic communication in which the nurse attempts to put vague ideas into words.



#34

A patient with a paranoid personality disorder mistrusts people and doesn't work together with others as a way to handle the problems. Which one is the most appropriate nursing intervention?

- Directly confronting the patient
- Diverting patient's mind into the recreational activities
- Taking feedback about the patient from his family
- Clarifying thoughts and belief regarding an incident

Ans. (d) Clarifying thoughts and belief regarding an incident

Explanation: The paranoid personality disorder is marked by unrelenting mistrust and suspicion of others, even when there is no reason to be suspicious. Person with paranoid personality disorder searches for hidden meaning and hostile intentions in everything others say. So the most appropriate nursing intervention is to clarify thoughts and belief regarding an incident.

#35

A patient demonstrates: persistent social inhibition, agoraphobia, fear of criticism, thoughts of inferiority to others, and feelings of being totally unattractive to others. The nurse interprets these actions as features of which disorder?

- Schizoid personality disorder
- Schizotypal personality disorder
- Avoidant personality disorder
- Borderline personality disorder

Ans. (c) Avoidant personality disorder

Explanation: Avoidant personality disorder is characterized by social inhibition, feelings of inadequacy, and sensitivity to rejection and criticism that cause problems in work situations and relationships. The disorder is characterized by extreme shyness and sensitivity to criticism from others and is known as a Cluster C personality disorder or one that involves anxious and fearful personality disorders.

#36

A newly-admitted patient had an argument with another patient of his room. After the argument the patient requests the nurse to change his room because he believes that all patients in the room are same and have a tendency to argue all the time with one another. The most appropriate interpretation of patient's believe is:

- Over-generalization
- Free association
- Unrealistic assumption
- Faulty inference

Ans. (a) Over-generalization

Explanation: Over-generalization mainly affects the clients with anxiety and depression. It is a cognitive distortion in which an individual views a single event as an invariable rule. The way of thinking an individual had one experience expecting the same to all experiences, including those in the future.

#37

A patient has thrown his food into the ward. The nurse makes him to clean the dirty area and mop the entire ward. Which behavior therapy technique the nurse has used?

- Punishment
- Time out
- Channing
- Restitution

Ans. (d) Restitution

Explanation: Restitution is defined as restoring the disturbed situation to a state that is better than before the occurrence of problematic behavior. A procedure that requires an individual return the environment to its state prior to the behavior which changes the environment.

#38

While caring for a patient with panic anxiety the nurse maintains calm, non-threatening matter-of-fact approach. What is the rationale behind this intervention?

- Anxiety is contagious
- To make the patient relax
- It may provide feeling of security
- It will decrease the patient's anxiety

Ans. (a) Anxiety is contagious

Explanation: A person with anxiety always faces trouble-relaxing so the relaxation technique is essential for the anxiety patients. While maintaining calm and non-threatening environment client can slowly get relief from the anxiety behavior. Cognitive therapy focuses on changing patterns of thinking and beliefs that are associated with trigger and anxiety.

#39

A patient with OCD was made to sit comfortably in a chair. Patient was made to recall the unwanted thoughts and as soon as the thoughts appear the patient was instructed to stop followed by a relaxation. The therapist is using which technique?

- Exposure and response prevention.
- Systemic desensitization.
- Thought stoppage
- Thought balancing

Ans. (c) Thought stoppage

Explanation: Thought stoppage in OCD is a cognitive intervention technique in which the process of suppressing or pushing away the unwanted repeated thoughts takes place. Whenever the unwanted thoughts reoccur, a command like 'stop' or using rubber band on the wrist of the patient is given to punish himself/herself in the intention of stopping the negative behavior.



#40

A patient complains that he is experiencing urges to perform unusual acts like beating a child, or giving threats to a child. The nurse documents that the patient is experiencing:

- Obsessional doubts
- Obsessional impulses
- Obsessional rituals
- Obsessional images

Ans. (b) **Obsessional impulses**

Explanation: Obsessional impulses are the ideas, thoughts and beliefs that force the clients mind to execute the obsessional impulse like behaving violently, shouting in the calm environment, hurting a child. Obsessional images mean repeated images or pictures about abnormal sexual activity. Obsessional doubts mean lack of confidence in one's own memory, attention and perception. Obsessional rituals mean repeating a certain form of words or senseless behavior.

#41

A person fears that something bad will happen if he throws anything away. He compulsively accumulates things that he doesn't need or use. The patient falls in which category of OCD?

- Arrangers
- Doubters
- Counters
- Hoarders

Ans. (d) **Hoarders**

Explanation: A person with hoarding disorder had excessive acquiring tendency and difficulty in discarding the items. In hoarding disorder, excessive accumulation of items rather than their use or there is no space for keeping the items, always had the feeling of need to save the items. The patients believe that the saved items are unique and will be needed in some point of time.

#42

A patient complains of persisting and distressing increase in fatigue after any mental and physical effort. The nurse documents this as:

- Neurasthenia
- Derealization
- Pathological fatigue
- Patient is lazy

Ans. (a) **Neurasthenia**

Explanation: It is a medical condition in which the client having the symptoms of dizziness, dyspepsia, muscle aches, irritability and physical fatigue. Fatigue is predominant in the neurasthenia. It is caused by a physical, neurological disease that affected the entire body, causing intense, long-term fatigue.

#43

A person has preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the person's concern is markedly excessive. He is likely to be suffering from.

- Somatization
- Hypochondriasis
- Body dysmorphic disorder
- Generalized anxiety disorder

Ans. (c) **Body dysmorphic disorder**

Explanation: Body dysmorphic disorder means person preoccupied with an imagined physical defect or minor defect that the other person cannot see. These people see themselves as ugly and avoid public exposure and try to improve their appearance by involving in plastic surgery. It affects both men and women equally and usually begins at the age group of early adulthood.

#44

In which disorder the most appropriate nursing intervention is to "encourage a patient to express her grief, complete the mourning process and use crisis intervention techniques as needed"?

- Depression
- Dysthymia
- Anxiety disorder
- Post-traumatic stress disorder

Ans. (d) **Post-traumatic stress disorder**

Explanation: Post-traumatic stress disorder is an anxiety disorder caused by very stressful, frightening or distressing events. The symptoms of PTSD like disturbed sleep, difficulty in concentration, irritability and guilt. Encourage the clients to express their grief, will help to relieve the client from distress.

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Psychiatric Nursing	
Tests	Number of Questions
Psychiatric Nursing Test 1	100 MCQs
Psychiatric Nursing Test 2	100 MCQs
Psychiatric Nursing Test 3	100 MCQs
Psychiatric Nursing Test 4	10 IBQs



Ans.

43. d
44. a
45. b
46. d
47. c
48. d
49. d
50. d
51. c
52. c
53. a
54. b
55. d
56. b
57. a

43. In psychoanalytic terms, obsessive compulsive disorder is fixed at:

- a. Oedipal stage b. Genital stage
c. Oral stage d. Anal stage

44. Which of the following is an example of classical conditioning?

- a. Dog learns to salivate on hearing bell
b. Rat presses lever to get food delivered
c. Crow pecks at key for food delivery
d. All of the above

45. Which of the following is an example of operant conditioning?

- a. Dog learns to salivate on hearing bell
b. Rat presses lever to get food delivered
c. Crow pecks at key for food delivery
d. All of the above

46. The theory of operant conditioning was experimented by:

- a. William James b. Ivan Pavlov
c. Harry Stock Sullivan d. B F Skinner

47. Which of the following therapy is based on learning theory?

- a. Cognitive therapy b. Psychoanalysis
c. Behavior therapy d. Milieu therapy

48. 'Reinforcement' is used in:

- a. Psychoanalysis
b. Hypno-analysis
c. Abreaction
d. Conditioned learning

49. According to Freud, Child adopts parental standards, traits and habits through:

- a. Regression b. Imitation
c. Introjection d. Identification

DEFENCE MECHANISM

50. Which of the following is an example of sublimation?

(AIIMS BPL NO 2018)

- a. Blaming the teacher for failing in exams
b. A woman has no memory of being sexually assaulted as a child
c. Child starts bedwetting after the birth of sibling
d. A young man who is dealing with aggression by playing football

Explanation: Rechanneling of drives or impulses (aggression) that are personally or socially unacceptable into activities that are constructive (playing football) is known as sublimation.

51. Adaptive mechanism of giving excuses when a person cannot solve a problem:

(AIIMS Nagpur NO 2018)

- a. Projection b. Substitution
c. Rationalization d. Compensation

Explanation: Rationalization is a process in which an individual justifies his failure and socially unacceptable behavior by giving socially approved reasons. **Example:** A student who fails in the examination may complain that the hostel atmosphere is not favorable and resulted in his failure.

52. In which defense mechanism anxiety is expressed through physical symptoms?

(AIIMS Raipur Staff Nurse Grade I-2018)

- a. Projection b. Regression
c. Conversion d. Hypochondriasis

Explanation:

- Conversion as a defense mechanism occurs where cognitive tensions manifest themselves in physical symptoms. The symptom may well be symbolic and dramatic and it often acts as a communication about the situation. Extreme symptoms may include paralysis, blindness, deafness, becoming mute or having a seizure.
- Regression is an ego defense mechanism in which person goes back to the earlier stage of development. Hypochondriasis means person believe that he/she may having serious but undiagnosed medical condition. Projection is blaming someone else for one's own difficulty.

53. Which of the following describes "ego defense mechanism"?

(DSSSB)

- a. A mechanism designed to reduce stress and conflict caused by specific experiences.
b. A mechanism designed to remove psychological barriers
c. Any form of martial arts
d. A method for negotiating a stage of development

Explanation: Defense mechanisms operate at an unconscious level and help ward off unpleasant feelings, (i.e., anxiety) or make good things feel better for the individual.

54. Rechanneling of socially unacceptable drives into activities that are more tolerable and constructive is known as:

- a. Displacement b. Sublimation
c. Intellectualization d. Projection

Explanation: It is the definition of sublimation. Displacement means transfer of feeling from one target to another. Intellectualization means avoidances of expression of actual emotion associated with stressful situation. Projection is attributing feelings or impulses unacceptable to one's self to another person.

55. Which of the following client behavior indicates displacement?

- a. Ignoring unpleasant aspects of reality
b. Resisting any demand made by others
c. Using imaginary activity to escape reality
d. Directing pent-up emotions to other than the primary source.

Explanation: Acting out angry or express feeling on a weaker or safer object indicates displacement.

56. A client stated that "people get angry and take it out on me". This sentence indicates which of the following defense mechanism.

- a. Denial b. Projection
c. Displacement d. Intellectualization

Explanation: Attributing unacceptable feeling to others is the mechanism known as projection.

57. Imposing one's own weaknesses to others is a defense mechanism, known as:

- a. Projection b. Intellectualization
c. Suppression d. Displacement

Explanation: Projection is a defense mechanism that involves taking our own unacceptable qualities or feelings and imposing them to other people.



58. Finding a logical reason for the things that one wants to do 'sour grapes' mechanism is:

- a. Projection b. Rationalization
c. Identification d. Sublimation

Explanation: In psychology, rationalization (also known as making excuses) is a defense mechanism in which controversial behaviors or feelings are justified and explained in a seemingly rational or logical manner to avoid the true explanation, and are made consciously tolerable – or even admirable and superior – by plausible means. It is also an informal fallacy of reasoning.

59. The involuntary blocking of unpleasant feeling and experiences from one's awareness is known as:

(RPSC Nursing Tutor 2009)

- a. Displacement b. Repression
c. Regression d. Suppression

Explanation: Repression involves placing uncomfortable thoughts in relatively inaccessible areas of the subconscious mind.

60. An attempt to avoid expressing actual emotions associated with a stressful situation by using the intellectual process of logic, reasoning and analysis is:

(AIIMS)

- a. Suppression b. Regression
c. Intellectualization d. Displacement

Explanation: Intellectualization is a defense mechanism where reasoning is used to block confrontation with an unconscious conflict and is associated with emotional stress where thinking is used to avoid feeling. The given situation refers to an intellectualization.

61. Most commonly using defensive mechanism by a physically abusive individual is:

- a. Transference b. Manipulation
c. Displacement d. Reaction formation

Explanation: In displacement one's pent up feelings are discharged from threatening person to less threatening individuals.

62. "Doctor shopping" is the characteristic of hypochondriac disease, which defense mechanism is the root of this behavior?

- a. Denial b. Compensation
c. Displacement d. Identification

Explanation: Patient with hypochondriasis believe that their physical symptoms are having some underlying pathology, but whenever the doctor says everything is normal and there is no underlying pathology, and the cause may be psychological they deny the words of doctor and go to another doctor.

63. The defense mechanism which returns to the earlier developmental stage is:

- a. Regression b. Repression
c. Projection d. Rationalization

Explanation: Going back to the earlier stages of development is the characteristic of regression. Involuntary blocking of unpleasant feelings is repression. Projection means attributing to another person feeling or impulses.

64. A defense mechanism that allows to convert our unacceptable behavior into acceptable form is:

(JIPMER 2015)

- a. Introjection b. Sublimation
c. Projection d. Displacement

65. An unconscious exclusion (forgetting) of distressing memories, thoughts, or feelings from the conscious mind is known as:

- a. Repression b. Fantasy
c. Displacement d. Identification

66. A conscious exclusion (forgetting) of distressing memories, thoughts, or feelings is known as:

- a. Repression b. Suppression
c. Displacement d. Identification

67. A surgeon, whose patient did not respond as he anticipated, blamed the theatre nurse who helped him at the time of surgery. Which of the following defense mechanism was used by the surgeon?

- a. Intellectualization b. Rationalization
c. Suppression d. Projection

68. Mr Prakash says, "I don't cry because my wife can't bear it". This is an example of:

- a. Suppression b. Undoing
c. Rationalization d. Reaction formation

69. Defense against feelings of inferiority and inadequacy is known as:

- a. Repression b. Sublimation
c. Regression d. Compensation

70. The defense mechanism in which the controversial behaviors or feelings are justified and explained in a seemingly rational or logical manner is known as:

- a. Intellectualization b. Rationalization
c. Identification d. Regression

71. Individuals attributing their own thoughts, feeling and motives to another person is known as:

- a. Rationalization b. Projection
c. Reaction formation d. Displacement

72. Patient who is newly-diagnosed with cancer frequently use the defense mechanism of:

- a. Displacement b. Reaction formation
c. Denial d. Projection

73. A mechanism designed to reduce stress and conflict caused by specific experiences is known as:

- a. Immune mechanism b. Defense mechanism
c. Catharsis mechanism d. Coping mechanism

74. Repression refers to:

- a. Conscious exclusion of bad memories that cause anxiety from mind
b. Unconscious exclusion of bad memories that cause anxiety from mind
c. Diversion of energy into positive and socially acceptable activities
d. Stopping bad thoughts from memory

75. A client with substance use disorder joins a self-help group and preaches against substance abuse. He is likely demonstrating the use of:

- a. Displacement b. Suppression
c. Reaction formation d. Projection

76. A dishonest person thinks other persons are also dishonest. Defense mechanism used by him is:

- a. Projection b. Introjection
c. Suppression d. Rationalization

77. Which of the following defense mechanism is often used by drug dependents to forget shame and pain?

- a. Sublimation b. Compensation
c. Repression d. Displacement

Ans.

58. b
59. b
60. c
61. c
62. a
63. a
64. b
65. a
66. b
67. d
68. c
69. d
70. b
71. b
72. c
73. b
74. b
75. c
76. a
77. c



OBSTETRIC AND GYNECOLOGICAL NURSING

SYNOPSIS

ANATOMY OF FEMALE REPRODUCTIVE SYSTEM

Organs engaged in copulation, fertilization, growth and development of the fetus and its delivery are reproductive organs in female. These organs are broadly divided into:

- External genitalia
- Internal genitalia
- Accessory reproductive organs

External Genitalia (Vulva, Pudendum)

It includes:

- **Mons Pubis:** It is a pad of subcutaneous adipose tissue antero superior to pubic symphysis. It is covered by hair in adults.

- **Labia Majora:** Subcutaneous tissue covering the vulva at the sides (homologous to scrotum in males).
- **Labia Minora:** Thin fold of skin without fat located inside the labia majora. Made up of erectile connective tissue (homologous to penile urethra and part of skin of penis in males).
- **Clitoris:** Small erectile body located anteriorly to vulva consisting of glans, body and two cura. (homologous to penis in males).
- **Vestibule:** It is triangular space consisting of four openings:-
 - Urethral opening
 - Vaginal orifice and hymen
 - Opening of Bartholin's ducts
 - Skene's gland
- **Perineum:** Muscle and tissue located between the vaginal opening and anal canal.



Key Points

- **External genital organs (vulva)** include mons pubis, labia majora, labia minora and clitoris.
- **Clitoris** is measuring about 1.5–2 cm. It is situated in the most anterior part of the vulva.
- The **internal genital organs** in female include vagina, uterus, fallopian tube and ovaries.

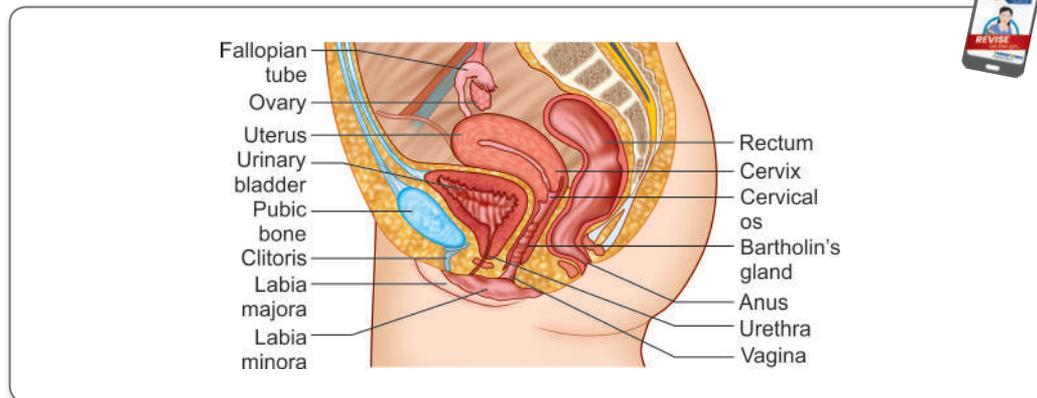


Figure 1 ■ Anatomy of female reproductive system

Internal Genitalia

It includes:

Vagina

- Vagina connects the cervix to external genital.

- It is located between rectum and bladder.
- 2.5 cm in diameter, it is widest in upper part and narrowest at introitus.
- From puberty, vaginal pH is acidic (4–5 pH) because of lactic acid produced by Doderlein's bacilli.



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ANATOMY OF AMNIOTIC FLUID AND UMBILICAL CORD

Amniotic Fluid

- **Amount:**
 - 50 mL at 12 week
 - 400 mL at 20 week
 - Reaches to its peak of 1 Liter at 36–38 weeks and finally starts diminishing afterwards and it about 600–800 mL at term.

- If pregnancy continues post term, it further reduces to 200 mL at about 43 week.
- **Specific gravity:** 1.010
- **Osmolarity:** 250 mOsm/L suggests fetal maturity.
- **Color:** In early pregnancy- colorless, near term- pale straw color due to the presence of exfoliated lanugo and epidermal cells, may look turbid due to vernix caseosa.

Table 2: Colors of amniotic fluid and their interpretation

Color of Amniotic fluid	Interpretation
Colorless, pale straw color	Normal
Green (fetal distress)	Fetal distress/Meconium aspiration
Golden	Rh incompatibility
Greenish Yellow of Saffron	Post maturity
Dark colored or blood stained	Abruption (concealed accidental hemorrhage)
Dark brown (tobacco juice)	Intrauterine Death
Purulent	Chorioamnionitis

Circulation

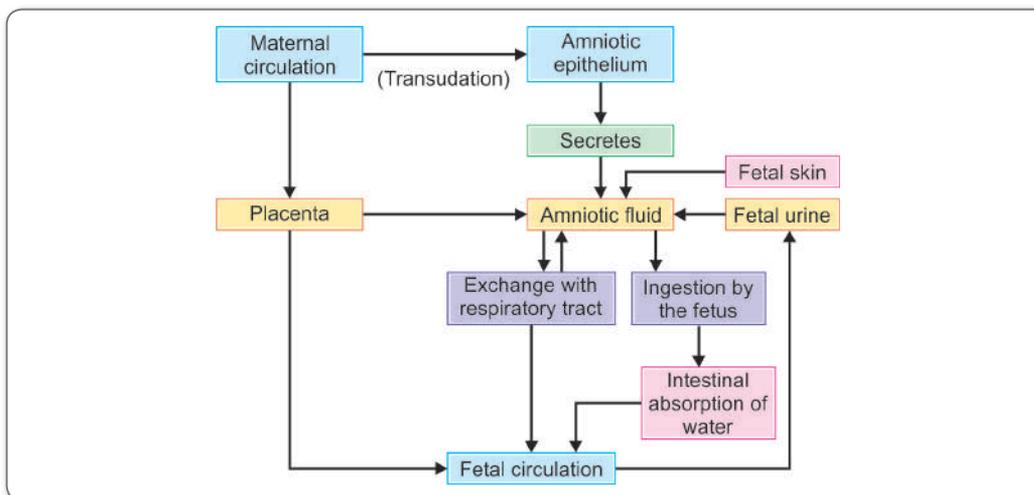


Figure 8 ■ The origin and circulation of amniotic fluid

Functions

- **During Pregnancy**
 - Shock absorber
 - Maintains even temperature
 - Allows the growth of fetus and its movement within the amniotic cavity
 - Adequate water supply with minimal nutritive value
- **During Labor**
 - Helps in dilatation of cervix
 - Prevents interference with placental circulation during uterine contraction

- Prevents umbilical cord compression
- Flushes the birth canal to prevent ascending infection into uterine cavity at first stage of labor.

Clinical Importance

- Amniotic fluid study tells about the fetal maturity
- Used for induction of abortion by instilling intra amniotic chemicals
- AFI-amniotic fluid index helps to diagnose polyhydraminos or oligohydraminos.



Key Points

- Amniocentesis, chorionic villi and alpha-fetoprotein sampling are performed to diagnose any genetic abnormalities in fetus.
- The amniocentesis procedure is not done before the 15th-16th weeks after conception.
- **Amniotic fluid volume** reaches the **peak (1000 mL) at 36–38 weeks.**
- The specific gravity of amniotic fluid is **1.010.**
- Amniotic fluid is **alkaline in nature.**
- Amniotic fluid contains 98-99% water, 1–2% solid.
- **Nitrazine paper test** is used to distinguish amniotic fluid from urine. Paper turns **blue** in case of amniotic fluid and **yellow** in case of urine.
- **Protection of the fetus** is the main function of amniotic fluid.



Umbilical Cord

- It connects fetus and placenta though fetal blood flows to and from placenta.
- Length—50–60 cm. It varies from 30 cm to 100 cm).
- Diameter about 1.5 cm (range 1–1.25 cm) with non-uniform thickness having nodes or swelling at places.
- It consists of covering epithelium, Wharton's jelly and blood vessels.
- The umbilical vein carries the oxygenated blood from placenta to fetus.
- There are **two arteries and one vein** present in the umbilical cord singleton pregnancy.

FETAL CIRCULATION

- Single umbilical vein carries 80% oxygenated blood from placenta towards the fetus. While it is moving toward the heart of the fetus one branch will give blood to the fetal liver. Then the umbilical vein enters into the inferior vena cava through ductus venosus and it empty into right atrium.
- From right atrium majority of the blood will move towards left atrium via foramen ovale and the remaining blood will move towards right ventricle through tricuspid valve.

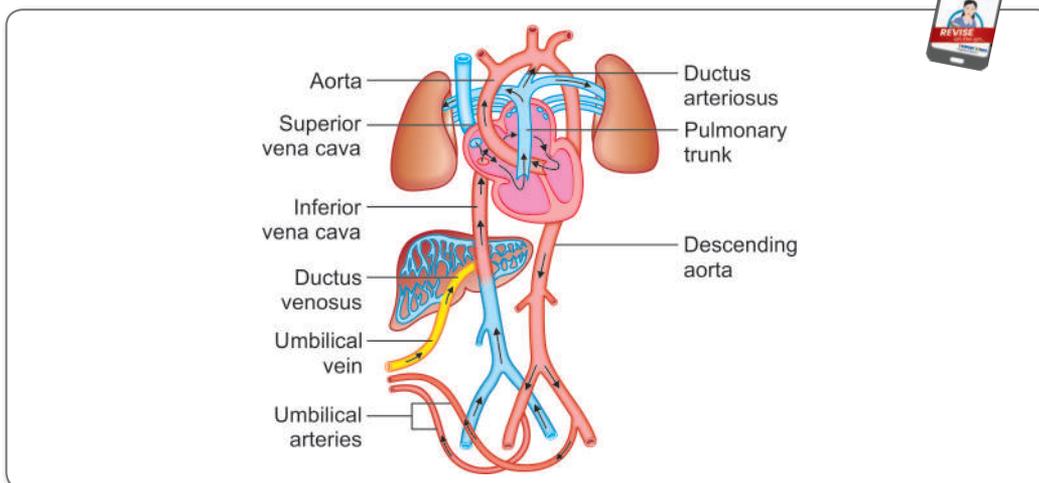


Figure 9 ■ Fetal circulation

- The blood in the left atrium will move towards left ventricle via bicuspid valve (mitral valve).
- During systole the blood in the left ventricle move towards aorta and it supplies the body parts of fetus.
- The blood in the right ventricle moves towards pulmonary artery. But in the fetal state pulmonary system pressure is higher than the systemic pressure so blood will move from pulmonary artery to aorta via ductus arteriosus.
- Two umbilical artery carry deoxygenated blood from various parts of the fetal body towards the placenta.
- After the birth of the newborn all these connections will close and
 - ductus venosus becomes ligamentum venosum
 - ductus arteriosus become ligamentum arteriosum
 - foramen ovale becomes fossa ovalis

ANATOMY AND TYPES OF FEMALE PELVIS

Female Pelvis

- There are four pelvic bones:
 - Two innominate bones or hip bones
 - One Sacrum
 - One Coccyx.
- Each **innominate bone** is composed of three parts
 - **The Ilium:** larger flared out part.
 - **Ischium:** thick lower part.
 - **Pubic bones:** forms the anterior part.
 - **Sacrum:** A wedge shaped bone consisting of 5 fused vertebrae.
- **Coccyx:** A small triangular bone, a vestigial tail. Consists of 4 fused vertebrae.



Key Points

- **Funis** is other name of the **umbilical cord**.
- There are **two arteries** and **one vein** present in the umbilical cord singleton pregnancy.
- Oxygenated blood enters the fetal circulation from umbilical vein via ductus venosus.
- Closure of the umbilical arteries takes about 2–3 months after delivery.



Recent Question (NORCET 2020)

3. Which of the following position is advised to relieve cord compression during labor?
- Supine
 - Left lateral
 - Steep Trendelenburg
 - Lithotomy

Ans. (b) Left lateral



Recent Question (CNCI 2021)

4. Station in obstetric pelvis is related to _____?
- Iliac spine
 - Ischial spine
 - Coccyx
 - Ileum spine

Ans. (b) Ischial spine

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- There are **four pelvic joints**:
 - **One symphysis pubis**: form the junction of two pubic bones.
 - **Two Sacroiliac joints**: connects the spine to the pelvis.
 - **One Sacro**: coccygeal joint.
- Types of Female Pelvis**
- **Gynecoid Pelvis (Female Pelvis)**
 - It is the most suitable female pelvic shape. Round pelvic inlet and shallow pelvic cavity with short ischial spines.
 - Transverse diameter is more than anteroposterior diameter.
 - It allows normal child birth with ease and is most suitable for child birth.
 - **Android Pelvis (Male Pelvis)**
 - Male type or wedge shaped pelvis.
 - Has triangular or heart-shaped inlet and is narrower from the front.
 - **Anthropoid Pelvis**
 - Oval shaped inlet with large anteriorposterior diameter and comparatively smaller transverse diameter.
 - It has larger outlet. The problem in this pelvis is the inlet.
 - **Platypelloid Pelvis**
 - Flat type pelvis. It has narrow anterioposterior diameter of pelvic inlet.
 - The pelvic inlet is specifically kidney shaped.

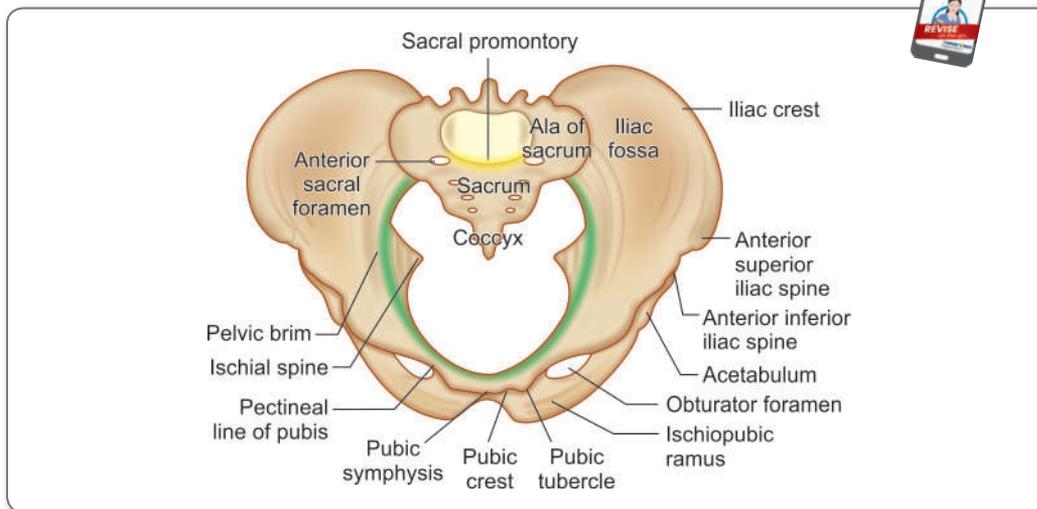


Figure 10 ■ Female pelvis

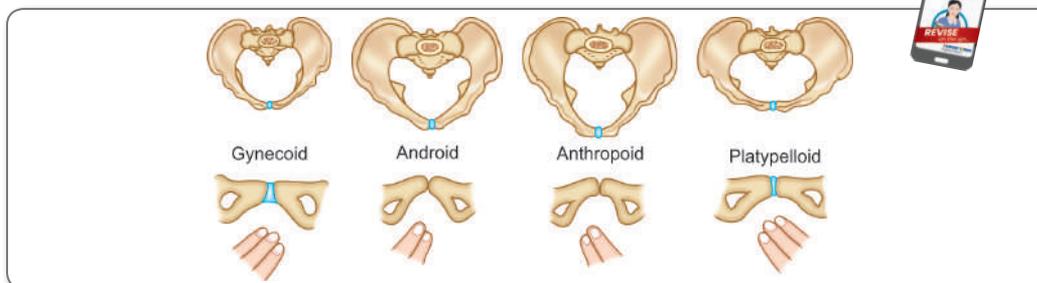


Figure 11 ■ Types of pelvis

PELVIC DIAMETER

Diameters of Pelvic Inlet

- **Anteroposterior diameter**:
 - Anatomical anteroposterior diameter (true conjugate) = 11 cm
 - From the mid of the sacral promontory to the inner margin of upper border of the symphysis pubis.
- **Obstetric conjugate** = 10 cm
 - From the tip of the sacral promontory to the most bulging point on the back of symphysis pubis. **It is the shortest anteroposterior diameter.**
- **Diagonal conjugate** = 12 cm
 - 1.5 cm longer than the true conjugate. From the tip of sacral promontory to the lower border of symphysis pubis.

Recent Question (NORECET 2020)



5. The pelvic shape has the poorest prognosis from vaginal delivery is-----

- Platypelloid
- Anthropoid
- Android
- Gynecoid

Ans. (c) Android



Key Points

- Absence of one ala of the sacrum is called **Naegele's pelvis**.
- Absence of both sacral alae is called **Robert's pelvis**.
- **Gynecoid pelvis** is the **most suitable** pelvic shape for **childbirth**.
- The shape of gynecoid is round.
- **Android pelvis** is least suited pelvic type for childbearing.
- An ischial spine is prominent in android pelvis.
- Obstetric conjugate is the shortest anteroposterior diameter.



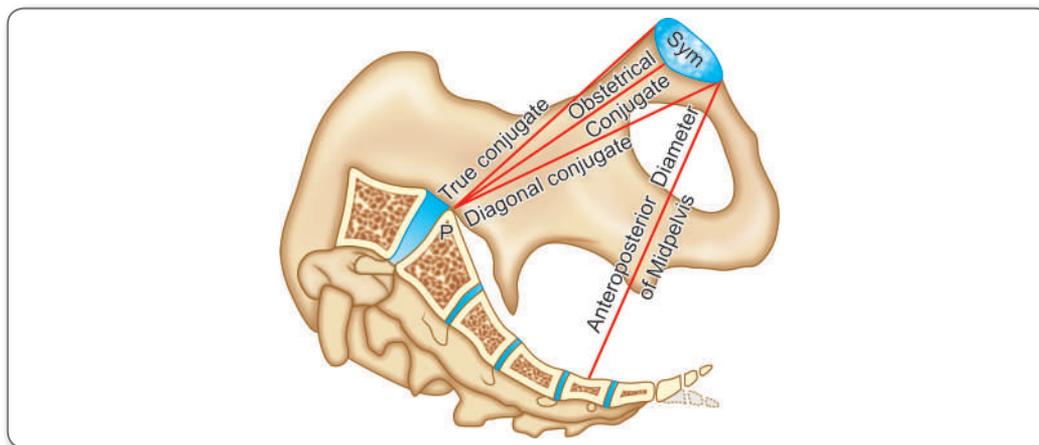


Figure 12 ■ Pelvic diameter

Table 3: Diameters of pelvis at inlet, cavity and outlet

Diameter of pelvis	Pelvis type		
	Pelvic inlet	Pelvic cavity	Pelvic outlet
Anteroposterior diameter (cm)	11	12	13
Oblique diameter (cm)	12	12	--
Transverse diameter (cm)	13	12	11

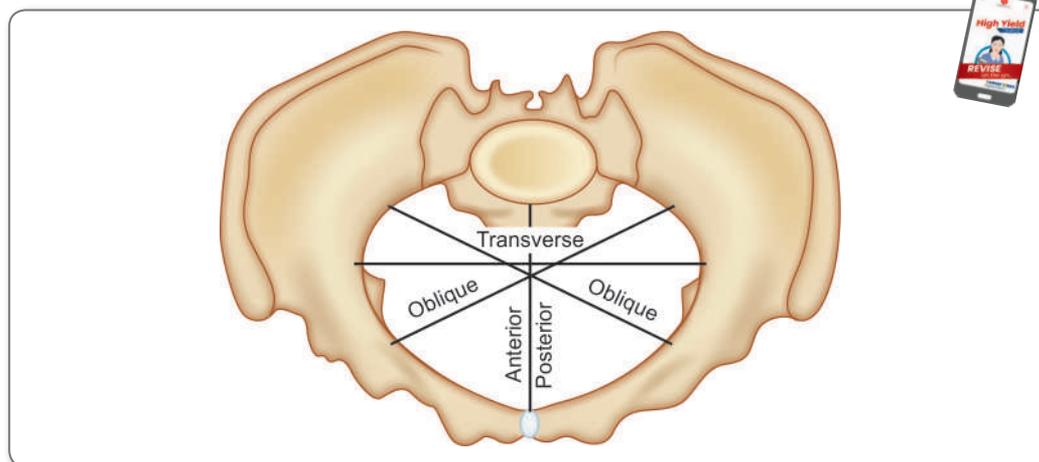


Figure 13 ■ Diameters of pelvis at inlet, cavity and outlet

- **Transverse diameters:**
 - Anatomical transverse diameter = 13 cm
 - Between the farthest two points on the iliopectineal lines.
 - It is the **largest diameter** in the pelvis.
 - Obstetric transverse diameter:
 - It bisects the true conjugate and is slightly shorter than the anatomical transverse diameter.
- **Diagonal/Oblique diameters:**
 - Right oblique diameter = 12 cm
 - From the right sacroiliac joint to the left iliopectineal eminence.
 - Left oblique diameter = 12 cm

- From the left sacroiliac joint to the right iliopectineal eminence.

Diameters of Pelvic Outlet

- Anteroposterior diameters:
 - Anatomical anteroposterior diameter = 11 cm
 - From the tip of the coccyx to the lower border of symphysis pubis.
 - Obstetric anteroposterior diameter = 13 cm
 - From the tip of the sacrum to the lower border of symphysis pubis as the coccyx moves backwards during the second stage of labor.



Students Notes



- Transverse diameters:
 - Bituberous diameter = 11 cm
Between the inner aspects of the ischial tuberosities.
 - Bispinous diameter = 10.5 cm
Between the tips of ischial spines.

FETAL SKULL

As compared to an adult skull; fetus skull is a larger portion as compared to other body part. Adaptation of this fetal skull with maternal pelvis is one of the important things that need to take place during the process of delivery in order to avoid further complication or adverse events.

Parts of Fetal Skull

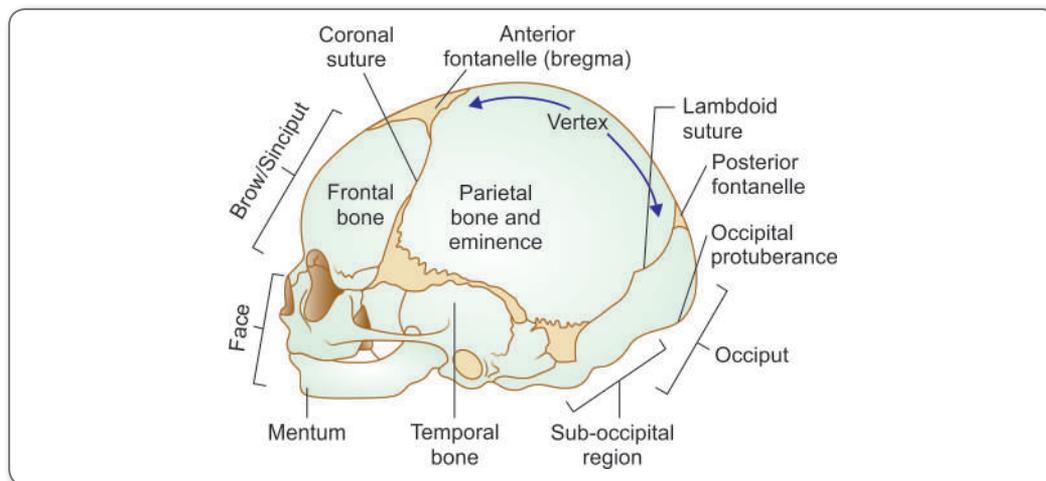


Figure 14 ■ Fetal skull

Bones in Fetal Skull

- 2 Frontal Bone
- 2 Parietal Bone
- 2 Temporal Bone
- 1 Occipital Bone

Table 4: Types of sutures and their location on fetal skull

Sutures	Locations
Frontal suture	Between two frontal bones
Coronal suture	Between frontal and parietal bone
Lambdoid suture	Two parietal bone and occipital bone
Sagittal suture	Two parietal bones

Fontanelle

Two frontal bone forms sinciput of the fetal skull. The space between the bones of the skull is suture and the area where the sutures meet is known as fontanelle. These sutures and fontanelle help the fetal skull to mold during the process of delivery.

- **Anterior fontanelle (bregma):** Formed at the junction between frontal, coronal and sagittal

sutures, since it is at the junction of 4 sutures it is diamond in shape. It is closed by 18 months of age.

- **Posterior fontanelle (lambda):** It is formed at the junction between lambdoid suture on either side and sagittal suture, and is triangle in shape. It is closed by the age of 2–3 months of age.



Key Points

- In an infant, a bulging fontanel is the most significant sign of increasing intracranial pressure.
- **Anterior fontanelle** becomes ossified around 18th month after birth.
- **Posterior fontanelle** becomes ossified around 6 weeks after birth.
- Anterior fontanelle is diamond shaped.
- Posterior fontanelle is triangular shaped.





#13

A mother with 39+3 weeks period of gestation is in her second stage of labor. During this stage how frequently the contractions need to be monitored?

- a. 5 minutes
- b. 10 minutes
- c. 15 minutes
- d. 30 minutes

Ans. (c) 15 minutes

Explanation: Second stage of labor starts with fully dilated cervix to the delivery of the baby. In this stage nurse needs to monitor strength, frequency, and duration of contraction every 15 minutes. If any maternal or child issue is detected, monitoring needs to be done more frequently.

#14

While doing antenatal examination to a client in her first trimester doctor noticed her fundal height is more than the actual period of gestation. He diagnosed it as gestational trophoblastic disease and ordered ultrasound. What will be the finding in ultrasound?

- a. Empty gestational sac
- b. Grape like structures
- c. Fetus with congenital abnormalities
- d. Ectopic pregnancy

Ans. (b) Grape like structures

Explanation: Gestational trophoblastic disease is a condition in which abnormal trophoblast cells grow inside the uterus after conception. It includes hydatidiform mole, invasive mole, choriocarcinoma, etc. Abnormal vaginal bleeding and a uterus that is larger than normal period of gestation are the common findings of this condition. On ultrasound it shows grape like structures.

#15

Client admitted with labor pain and nurse did vaginal examination for the client. The findings of the PV are cervix 8 cm dilated, 70% effaced and position is +1. Based upon the findings one should understand that presenting part of the fetus is at:

- a. 1 cm above the ischial spine
- b. At the level of ischial spine
- c. 1 cm below the ischial spine
- d. At the vagina

Ans. (c) 1 cm below the ischial spine

Explanation: Presenting part location is determined in relation with ischial spine. If the presenting part is at ischial spine then station is zero, if the presenting part is above the ischial spine it is recorded as -1, -2, -3, etc. If the presenting part is below the ischial spine then +1, +2, +3.

#16

Client Lucy received her biophysical profile test result for her fetus and the score is 6. Client asked the nurse how to interpret the result. Most appropriate response from the nurse is:

- a. Its normal finding and fetus is healthy
- b. Need to repeat test after 24 hours
- c. High risk for fetal hypoxia
- d. Indicates IUD

Ans. (b) Need to repeat test after 24 hours

Explanation: Biophysical profile measures the health status of a fetus. It measures 5 components such as baby's heart rate, muscle tone, movement, breathing, and the amount of amniotic fluid around the baby. Each parameter has a maximum score of 2 and minimum score of zero. So total score for the test is 10 and minimum score for the test is zero. Interpretation of score is as follows, a score of 8 or 10 points means that baby is healthy. A score of 6 or 8 points means that need to be retested in 24 hours. A score of 4 or less may mean the baby is having problems.

#17

Obstetrician ordered magnesium sulfate injection to a woman with preeclampsia. Nurse should understand that the purpose of this injection in this client is:

- a. To reduce blood pressure
- b. To reduce proteinuria
- c. To prevent seizure
- d. To prevent preterm labor

Ans. (c) To prevent seizure

Explanation: Main aim of administering magnesium sulfate injection is to prevent seizure. Magnesium will act like calcium and interrupt signal transmission in hyperstimulated neurological system.

#18

Nurse was assessing a primipara mother following vaginal delivery in the immediate post-partum period. One of the nursing students asked the nurse why she is using both hands. Which among the following responses is correct from the nurse?

- a. To prevent PPH
- b. To prevent involution
- c. To prevent inversion
- d. To prevent uterine atony

Ans. (c) To prevent inversion

Explanation: Using both hands during the post-partum period to palpate the uterus will help to prevent uterine inversion.



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#19

Family planning room nurse was educating a woman regarding oral contraceptive. She instructed her to take pills on same time every day. What is the reason behind the statement?

- To make it as a routine
- To reduce the side effects of OCPs
- To maintain hormonal levels in the blood.
- Prevent drug to drug interaction

Ans. (c) To maintain hormonal levels in the blood.

Explanation: Same time intake every day will help to maintain blood level of hormones and thus prevent the hypothalamo-hypophyseal access from secretion of FSH and LH. Thereby prevent the ovulation.

#20

Primipara mother came to labor room with the complaint of pain. Nurse assessed the characteristics of pain and reordered it as false pain. Which among the following could have reported by the mother?

- Pain is in the lower abdomen only
- Hardening of uterus is there
- Bag of waters formed
- Cervix is 4 cm dilated

Ans. (a) Pain is in the lower abdomen only

Explanation: Characteristic of true labor pain includes pain in the lower abdomen, back and radiating to thighs. It is associated with hardening of uterus and cervical dilation. Bag of water also called amniotic sac will be present. Pain is not relieved by enema.

#21

Nurse educator was taking class on partograph. At the end of the class, she was evaluating her students. Which statement made by the students indicate that further explanation is needed?

- In partograph alert line starts at 3 cm of cervical dilation
- In partograph fetal heart rate is reordered every 30 minutes
- Each square in cervical dilation part indicates 1 cm dilation
- Action line is parallel and 4 hours to the right of alert line

Ans. (a) In partograph alert line starts at 3 cm of cervical dilation

Explanation: It is a composite graphical recording of cervical dilatation and descent of head against duration of labor in hours. It also gives information about fetal and maternal condition that are all recorded on single sheet of paper. In partograph alert line starts at 4 cm dilation. All other statements given regarding partograph are correct.

#22

Following a class on partograph the nurse educator understands that the class was effective if the student identified which among the following as NOT a component of partograph?

- Cervical dilation
- FHR
- Descent of head
- Effacement

Ans. (d) Effacement

Explanation: FHR, cervical dilation, descent of the head, contractions per 10 minutes, oxytocin dose, drugs and IV fluids given, pulse and BP of mother, temperature of mother, and urine volume, protein and acetone are the components of partograph.

#23

After the delivery of 3000 gm weighing baby by a primipara mother, nurse was waiting for the delivery of the placenta. Nursing student who was witnessing the labor asked the nurse what is the expected weight of placenta? What should be the response from the nurse?

- 250 gm
- 500 gm
- 600 gm
- 750 gm

Ans. (b) 500 gm

Explanation: At the term, expected weight of the placenta is one sixth of the baby's weight. Here the baby's weight is 3000 gm and therefor placenta weight will be 500 gm.

#24

Nurse educator was taking class on ectopic pregnancy. Following class, she asked the students which is the most common site of tubal ectopic pregnancy. Correct response from the group is:

- Ampulla
- Isthmus
- Infundibulum
- Interstitial

Ans. (a) Ampulla

Explanation: Tubal ectopic pregnancy is the most common type (97%) of ectopic pregnancy. Ampulla (55%) part of the fallopian tube is the most common site for tubal ectopic pregnancy followed by isthmus (25%), infundibulum (18%) and interstitial (2%).

#25

Nurse Linda was assisting a client with precipitated labor. As an experience; nurse she should anticipate for all the following complications; EXCEPT:

- PPH
- Injury to birth canal
- Intracranial hemorrhage in baby
- Premature separation of placenta

Ans. (d) Premature separation of placenta

Explanation: Precipitate labor is a condition in which combined duration of first and second stage is less than 3 hours. Injury to birth canal, PPH, placenta retention, uterine rupture, infection, fetal hypoxia, intracranial hemorrhage, trauma to fetal skull are the complications of this condition.

#26

Following a class on hormones and pregnancy teacher asked the students regarding the function of follicle stimulating hormone. The correct answer from the student is:

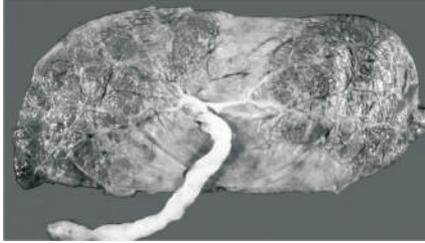
- Prepare the endometrium for potential pregnancy
- Maturation of the Graafian follicle
- To control the menstrual cycle
- Regulating the function of the testes



Ans.

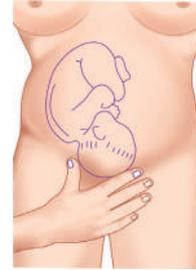
- 33. d
- 34. d
- 35. c
- 36. b
- 37. d
- 38. d
- 39. b
- 40. d

33. Identify the type of placenta insertion shown in the photograph.



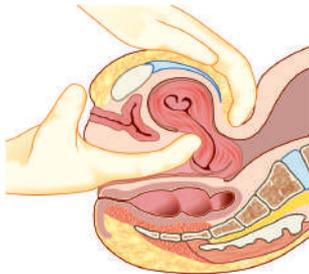
- a. Velamentous
- b. Circummarginate
- c. Succenturiate
- d. Circumvallate

37. Maneuver shown in the photograph is known as:



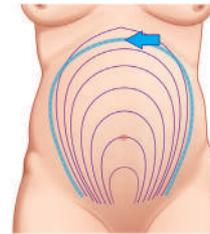
- a. Fundal palpation
- b. Lateral palpation
- c. Deep pelvic palpation
- d. Pawlik's grip

34. Clinical sign shown in the photograph is known as:



- a. Chadwick's sign
- b. Oslander's sign
- c. Palmer's sign
- d. Hegar's sign

38. Uterine size (arrow) shown in photograph represent gestational age of:



- a. 24 weeks POG
- b. 32 weeks POG
- c. 38 weeks POG
- d. 40 weeks POG

35. Sign (arrows) shown in the photograph is positive by:



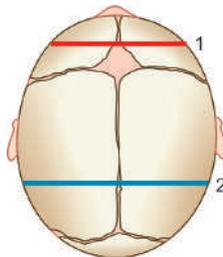
- a. 12-14 weeks POG
- b. 14-16 weeks POG
- c. 18-20 weeks POG
- d. 36-38 weeks POG

39. Fetal lie type as shown in the photograph is known as:



- a. Vertex
- b. Breech
- c. Oblique
- d. Transverse

36. Identify the diameter '1' shown in the fetal skull photograph.



- a. Biparietal
- b. Bitemporal
- c. Occipitofrontal
- d. Mentovertebral

40. Fetal attitude as shown in the photograph is known as:



- a. Flexed
- b. Deflexed
- c. Partial extended
- d. Extended



40. **The layer of uterus that is sloughed off during menstruation is:**
 a. Endometrium b. Myometrium
 c. Perimetrium d. Serous layer
41. **The first episode of menstrual bleeding is called:**
 a. Thelarche b. Menarche
 c. Menopause d. Menorrhoea
42. **The phase in which the lining cells of the ovarian follicle are stimulated by luteinizing hormone to develop the corpus luteum, to produce progesterone and estrogen is:**
 (AIIMS Raipur Grade II 2017)
 a. Menstrual phase b. Proliferative phase
 c. Secretory phase d. Follicular phase

FUNDAMENTALS OF REPRODUCTION

43. **Vaginal pH is:**
 a. 3.8-4.5 b. 4.5-6.0
 c. 5.0-6.5 d. 6.5-7.5
44. **Bartholin gland is found in:** (RRB Feb 2012)
 a. Cervix b. Ovary
 c. Vagina d. Uterus
45. **Site of fertilization in female reproductive system is:**
 a. Ovary b. Cervix (RRB Feb 2012)
 c. Uterus d. Fallopian tube

Explanation: Fertilization occurs at the ampullary part of fallopian tube.

46. **Endometrium after conception is known as:** (RRB Feb 2012)
 a. Perimetrium b. Myometrium
 c. Decidua d. Prometrium
47. **Which chemical present in the acromial tip of sperm facilitates the penetration of zona pellucida of ovum?**
 a. Hydrochloric acid b. Hyaluronidase
 c. Formalin d. Acetyl choline

Explanation: Hyaluronidase is a chemical present in the acromial tip of the sperm which facilitates the penetration of zona pellucida of ovum.

48. **After ovulation corpus luteum formed in the ovary releases:**
 (Staff Nurse G II 2014)
 a. Testosterone b. Aldosterone
 c. Progesterone d. Estrogen
49. **Fertilized ovum reaches the uterus in:**
 a. 3-4 days
 b. 6-8 days
 c. 10-12 days
 d. 12-14 days
50. **The first evidence of pubertal development in female is usually manifested as:** (Banaras HU 2015)
 a. Onset of menarche
 b. Appearance of breast buds
 c. Appearance of axillary and pubic hair
 d. Onset of growth spurt
51. **Puberty onset in girls starts with:**
 a. Menarche
 b. Growth spurt
 c. Menopause
 d. Thelarche and growth of pubic hair

52. **True regarding primary oocytes is:**
 a. All primary oocytes are formed in prenatal life
 b. All primary oocytes are formed just after the birth
 c. All primary oocytes are formed after menarche
 d. Primary oocytes are formed just before menstruation
53. **The primary oocytes remain suspended in Phase of meiosis I.**
 a. Prophase b. Metaphase
 c. Anaphase d. Telophase
54. **Mrs. Amrita had an abortion during sixth week of gestation. The developmental stage of product of conception during this period is known as:**
 a. Fetus b. Zygote
 c. Embryo d. Blastocyst
55. **Seven weeks after the conception, the growing structure inside a uterus is now called:** (RAK MSc 2018)
 a. Zygote b. Embryo
 c. Fetus d. Neonate

Explanation:

- Conception to 8th week of gestation – Embryo
- 8th week to delivery – Fetus
- Birth to 4 weeks (28 days) – Neonate
- 4 weeks to 1 year - Infant

56. **The phenomenon of mittelschmerz indicates:** (AIIMS BPL NO 2018)
 a. Menstruation b. Ovulation
 c. Implantation d. Fertilization

Explanation: Mittelschmerz is one-sided lower abdominal pain and pelvic region associated with ovulation. This occurs roughly midway through a woman's menstrual cycle. The pain can appear suddenly and usually subsides within hours, although it may sometimes last two or three days.

57. **Fleeting abdominal pain due to follicular bleeding causing peritoneal irritation is called:** (Safdarjung NO 2018)
 a. Corpus hemorrhagicum
 b. Mittelschmerz
 c. Corpus luteum
 d. Corpus albicans

Explanation: Minor bleeding from the follicle into the abdominal cavity may cause peritoneal irritation and fleeting lower abdominal pain. It is known as **mittelschmerz**.

After ovulation, hemorrhage into the remains of the follicle usually occurs resulting in a structure called a **corpus hemorrhagicum**.

58. **When is the best time to achieve pregnancy?** (RAK MSc 2018)
 a. Midway between 7th and 8th day of ovulation
 b. Immediately after starting of menses
 c. 14 days after the beginning of period
 d. 7 days before the next period is expected

Explanation: The best time to achieve pregnancy is 14 days before the next period is expected, if cycle is of 28 days. It is the time of ovulation, i.e., release of ovum and the LH surge precedes before ovulation that provides the best conditions for the fertilization.

Ans.

40. a
 41. b
 42. c
 43. a
 44. c
 45. d
 46. c
 47. b
 48. c
 49. a
 50. b
 51. d
 52. a
 53. a
 54. c
 55. b
 56. b
 57. b
 58. c



Ans.

59. b
60. b
61. c
62. b
63. a
64. a
65. b
66. a
67. b
68. c
69. d
70. a
71. c
72. c
73. b
74. d
75. a
76. a
77. a
78. b
79. b
80. c
81. b
82. b
83. a
84. c
85. c
86. a

59. The process of maturation of the female egg is termed:
a. Spermatogenesis b. Oogenesis
c. Archiogenesis d. Ovogenesis
60. What is the fertilization life span or viability for oocyte?
a. <12 hours b. 12-24 hours
c. 24-48 hours d. 48-72 hours
61. Spermatozoa is viable for a period of:
a. 12-24 hrs b. 24-48 hrs
c. 48-72 hrs d. Up to 5 days
62. Discharge of ovum from the ovary is referred to as:
a. Maturation b. Ovulation
c. Proliferation d. Nidation
63. The fertilization of ovum in female takes place in the:
(LNJP HD 2012)
a. Vagina b. Cervix
c. Oviduct d. Uterus
64. Fertilized ovum is known as embryo up to _____ weeks of gestational age.
(Staff Nurse G II 2014)
a. 8 weeks b. 10 weeks
c. 12 weeks d. 16 weeks
65. Fertilized ovum up to 3-8 weeks is called: (RRB Feb 2012)
a. Morula b. Embryo
c. Fetus d. Blastula
66. Which of the following term refers to infrequent and irregular ovulation:
a. Oligoovulation b. Hypoovulation
c. Polyovulation d. None of these
67. After fertilization of ovum, the initial mitotic division of the zygote results in the formation of:
a. Morula b. Blastomeres
c. Oocytes d. Blastocysts
68. Implantation occurs on:
a. 3rd day after fertilization
b. 5th day after fertilization
c. 6th day after fertilization
d. 12th day after fertilization
69. Identify the correct statement regarding implantation:
a. Implantation occurs in anterior or posterior wall of the body near to fundus
b. Implantation occurs on 6th day following fertilization which corresponds to 20th day of regular menstrual cycle.
c. Implantation occurs through four stages apposition, adhesion, penetration and invasion
d. All of the above
70. Implantation of zygote is facilitated by:
a. Trophoblast b. Medulla
c. Cortex d. Blastocysts
71. Implantation occurs on:
a. 6th day after fertilization
b. 20th day of regular menstrual cycle
c. Both a and b
d. None of the above
72. In case of in-vitro fertilization, fertilized ovum transferred into the uterine cavity at:
a. 1-2 cell stage b. 2-4 cell stage
c. 4-8 cell stage d. 16-24 cell stage
73. How many pairs of chromosomes are there in a man?
(RRB Feb 2012)
a. 24 b. 23
c. 22 d. None of these
74. Corpus luteum is found in: (RRB Feb 2012)
a. Fetus b. Placenta
c. Uterus d. Ovary
75. Fusion of sperm and ovum is called: (RRB Feb 2012)
a. Fertilization b. Transfusion
c. Combination d. None of these
76. Ischial tuberosity helps for:
a. Bearing of body weight while sitting
b. Normal labor
c. Normal walking
d. Normal standing
77. Basal body temperature will following ovulation.
a. Increase
b. Decrease
c. No change
d. Fluctuation
78. The average age of puberty in girls is:
a. 9-10 years b. 10-12 years
c. 10-14 years d. 14-16 years
79. Time required to reach in two cell stage after fertilization is:
a. 10 hours b. 20 hours
c. 30 hours d. 40 hours
80. Time required to reach in 16 cell stage after fertilization is:
a. 2nd day b. 4th day
c. 6th day d. 8th day
81. Ovulation occurs soon after the formation of:
a. Primary spermatozoa b. Secondary spermatozoa
c. Primary oocyte d. Secondary oocyte
82. Where does oogenesis occurs in human?
a. Inner most layer of ovary b. Outermost layer of ovary
c. Fallopian tube d. Uterus
83. Correct order of oogenesis is:
a. Oogonia → primary oocyte → secondary oocyte → ovulation
b. Primary oocyte → secondary oocyte → oogonia → ovulation
c. Ovulation → primary oocyte → secondary oocyte → oogonia
d. Oogonia → ovulation → primary oocyte → secondary oocyte
84. How many numbers of chromosomes a primary oocyte/primary spermatocyte contains?
a. 46 b. 44
c. 23 d. 22
85. Number of chromosomes in secondary oocyte/secondary spermatocyte are:
a. 46 b. 44
c. 23 d. 22
86. Sex of the child is determined by the pattern of the sex chromosome supplied by:
a. Spermatozoon
b. Oocyte
c. Morula
d. Blastocyst

Explanation: All the above-mentioned statements are correct regarding implantation. Implantation means fertilized ovum is transferred from site of fertilization to uterus.



87. **Fertilization means:**
 a. Fusion of gametes and the spermatozoa
 b. Fusion of sperm and spermatozoa
 c. Fusion of spermatozoa with mature ovum
 d. None of the above
88. **Delayed puberty is:**
 a. The absence of testicular development by the age of 14 years in males
 b. The absence of breast development by the age of 13 years in females
 c. Primary amenorrhoea with normal breast development by the age of 15 in females
 d. All of the above
89. **Fertilization of two or more ova from the same cycle by sperm from separate acts of sexual intercourse is known as:**
 a. Superfetation b. Superfecundation
 c. Dizygotic pregnancy d. Monozygotic pregnancy
90. **In which part of the uterine tube does the fertilization process occur?**
 a. Isthmus b. Ampulla
 c. Infundibulum d. Intramural part
99. **Daughter cells formed after meiosis I contain chromosome.**
 a. Polyploid b. Aneuploid
 c. Diploid d. Haploid
100. **Which one of the periods of gestation is the most susceptible period for congenital malformations:**
 a. 1st week b. 2nd week
 c. 3rd week- 8th week d. 9th week-12th week
101. **The physiochemical changes that occur in the sperm to make it capable of fertilizing the ovum is known as:**
 a. Spermatogenesis b. Degeneration
 c. Capacitation d. Oogenesis
102. **Fetus forms from:**
 a. Morula b. Blastocyst
 c. Inner cell mass d. Syncytiotrophoblast
103. **At what week embryo can be differentiated as human?**
 a. 2nd week b. 4th week
 c. 6th week d. 8th week
104. **The nervous system of the fetus is formed by:**
 a. Ectoderm b. Endoderm
 c. Mesoderm d. Parenchyma
105. **First of all, fetal heart-sounds can be assessed:**

[AIIMS-2011]

- a. Between 2-3 weeks b. Between 8-10 weeks
 c. Between 10-12 weeks d. Between 16-18 weeks

PRINCIPAL EVENTS OF EMBRYONIC AND FETAL DEVELOPMENT

91. **A child's heredity is determined at the time of:**
 (RRB Feb 2012)

- a. Viability b. Delivery
 c. Conception d. Infancy

92. **Neural tube develops from:**
 a. Ectoderm b. Endoderm
 c. Mesoderm d. All of these
93. **Closure of neural tube begins at:**
 a. Cervical b. Cephalic
 c. Podalic d. Lumbar

Explanation: The closure of neural tube begins in the cervical area (in the middle of the embryo) and extends from there in both the cranial and caudal directions.

94. **The heart is developed from:**
 a. Paraxial mesoderm
 b. Intermediate mesoderm
 c. Splanchnopleuric intraembryonic mesoderm
 d. Somatopleuric intraembryonic mesoderm
95. **Rectum develops from:**
 a. Cloaca b. Hindgut
 c. Allantoic remnants d. Urogenital sinus
96. **Small intestine develops from:**
 a. Foregut
 b. Midgut
 c. Hindgut
 d. Endodermal cloaca
97. **Coronary sinus develops from:**
 a. Truncus arteriosus b. Conus
 c. Sinus venosus d. AV canal
98. **Fetus develops its own blood supply fromweek.**
 a. 10th to 12th week
 b. 12th to 14th week
 c. 12th to 16th week
 d. 12th to 20th week

THE PLACENTA AND FETAL MEMBRANES

106. **The thin rim of endometrial stroma overlying the blastocyst is known as:**
 a. Decidua capsularis b. Decidua vera
 c. Decidua basalis d. Decidua parietalis
107. **The cardinal function of decidua is:**
 a. Immune response
 b. Production of hormones
 c. Maintenance of pregnancy
 d. None of the above
108. **O₂ and CO₂ are exchanged in the placenta through the process of:**
 a. Pinocytosis b. Diffusion
 c. Facilitated diffusion d. Active transport
109. **The following is not a part of conceptus:**
 a. Amniotic fluid b. Decidua
 c. Fetus d. Membrane
110. **Characteristic hormone of the placenta is:**
 (Kerala PSC, Nov 2014)
 a. Estrogen b. Chorionic gonadotropin
 c. Corticotrophin d. Oxytocin
111. **Normal weight of placenta at term is:** (Staff Nurse G II 2014)
 a. 1/4th of baby weight b. 1/6th of baby weight
 c. 500 g d. 900 g
112. **The outermost membrane of the placenta is:**
 (LNJP H D 2012)
 a. Chorion
 b. Amnion
 c. Cotyledons
 d. Yolk sac
113. **Humans placenta fully develop at months of pregnancy.**
 (RRB Feb 2012)
 a. 2 months b. 3 months
 c. 1 month d. 4 months



Ans.

87. c
 88. d
 89. b
 90. b
 91. c
 92. a
 93. a
 94. c
 95. a
 96. b
 97. c
 98. d
 99. d
 100. c
 101. c
 102. c
 103. d
 104. a
 105. b
 106. a
 107. c
 108. b
 109. b
 110. b
 111. b
 112. a
 113. b

“One day in perfect health is much.”

—Arabic



SYNOPSIS

GROWTH AND DEVELOPMENT

Growth

Growth denotes the net increase in size or mass of tissue. It is a quantitative measurement.

Development

Development specifies the maturation of function. It is a qualitative measurement.

Stages of Growth and Development

Prenatal Period

Ovum	0–14 days after conception
Embryo	14 days to 8 weeks
Fetus	8 weeks to birth (8–40 weeks)

Postnatal Period

Neonate/newborn	0–28 days
Infancy	29 days – 1 year
Toddler	1–3 years
Pre-school child	3–6 years
School going child	6–10 years (girls) 6–12 years (boys)
Adolescent	puberty–adulthood
Early adolescent	12–14 years
Middle adolescent	14–16 years
Late adolescent	16–20 years

Factors Affecting Growth and Development

- Age
- Race
- Genetic factors
- Antenatal factors
- Natal factors
- Nutritional factors
- Hormonal factors
- Sex
- Biorhythm
- Seasonal variation

- Environmental factors (Infections, illness, trauma to growing parts of bones)
- Social factors (Socioeconomic class, cultural habits, education of parents, education of child, psychological factors and psychosocial factors)

Principles of Growth and Development

- Growth and development in children is a continuous orderly process.
- Growth pattern of every individual is unique.
- Different body tissues grow at different rates.
- Development is a continuous process.
- Development depends upon the maturation of nervous system.
- The sequence of attainment of milestone is same in all children.
- The process of development progresses in cephalocaudal direction and proximodistal direction.
- Certain primitive reflexes have to be lost before attainment of relevant milestone.
- The initial disorganized mass activity is gradually replaced by specific and willful actions.
- Development depends on maturation and learning.

Weight

The average weight of a neonate is 3 kg. In Indian children, 2.5 to 3.5 kg weight of a neonate is considered as normal.

In the first few days after birth, newborn loses extracellular fluid equivalent to 10% of the body weight. So, there will be slight decline in the birth weight of the baby. The usual pattern of gaining weight is shown in the table.



Key Points

- Growth and development in children are the continuous orderly processes.
- The sequence of attainment of milestone is same in all children.
- The process of development progresses in cephalocaudal direction and proximodistal direction.
- The baby attains three times of its birth weight by one year of age.
- The baby attains four times of its birth weight by two years and 5 times by three years of age.



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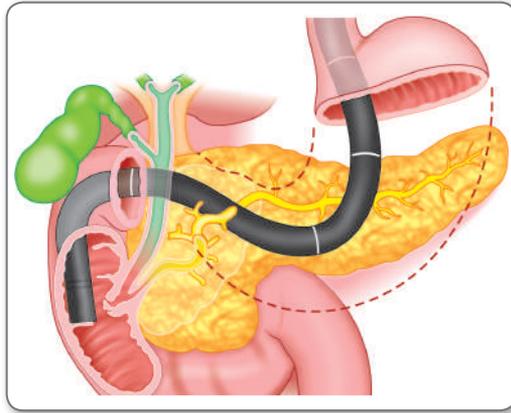


Figure 21 ■ ERCP

Management

- If correctable lesion, then choledochojejunostomy (surgical anastomosis of common bile duct and jejunum).
- If any correctable lesion is found, then hepatic portoenterostomy or **kasai** procedure (in this, extra hepatic duct is removed and jejunum is anastomosed with the hilus of liver) is done.
- Liver transplantation is the definitive treatment for atresia.

Wilson's Disease

- It is also called as hepatolenticular degeneration and lenticular degeneration.
- It is a rare autosomal recessive disorder of copper metabolism characterized by the multiple mutations in the ATP-ase 7B gene on chromosome 13q.

Clinical Manifestation

- **Kayser-Fleischer ring**: Color of the ring may be golden to brown or green seen in cornea.
- **Sunflower cataract**: Copper deposition in the lens gives sunflower appearance.
- Jaundice, Fatigue, nausea, vomiting, weight loss, and pain in abdomen
- **Spider angiomas**, muscle cramps and edema
- Hepatosplenomegaly and elevated liver enzyme
- Seizures, gait abnormalities, olfactory impairment
- Personality changes, cognitive impairment and depression
- Bone and joint involvement
- Hemolytic anemia, thrombocytopenia
- Hypercalciuria, hyperphosphaturia and hypokalemia
- Hypopigmentation of lower legs

Diagnosis

- Liver biopsy (hepatic copper determination)
- Slit lamp examination (for Kayser-Fleischer ring)
- Serum ceruloplasmin
- 24-hour urinary copper excretion

- Serum copper and serum free copper
- MRI
- Genetic testing

Management

- Chelating agents like trientine, penicillamine
- Zinc acetate: It blocks the digestive tract and absorption of copper from food
- Diet: Avoid foods containing high copper like shellfish, liver, mushroom, nuts, chocolate
- Liver transplantation in case of severe liver damage

Cholelithiasis

- Gallstones or cholelithiasis are stones that form in the gallbladder composed of cholesterol, bilirubin, and bile.
- Symptomatic patients present with **right upper abdominal pain** after eating greasy or spicy food, nausea, vomiting, pain in epigastrium that radiates to the right scapula or mid-back.

Diagnosis:

- USG, MRCP, ERCP, cholescintigraphy

Treatment

- Asymptomatic cases can be observed for spontaneous passage of stool
- Laparoscopic cholecystectomy
- Extracorporeal shock wave lithotripsy
- Cholecystectomy with splenectomy

Choledochal Cyst

- These are cystic dilation of extrahepatic duct, intrahepatic duct, or both that may result in progressive biliary obstruction and biliary cirrhosis.

Clinical Manifestation

- Triad of symptoms include pain in abdomen, palpable abdominal mass, jaundice
- Liver dysfunction, hepatomegaly

Diagnosis

- LFT
- USG, CT, HIDA scan, MRCP, ERCP

Management

- Laparoscopic excision of cyst
- Roux-en-Y hepaticojejunostomy

DISORDERS OF CARDIOVASCULAR SYSTEM

Congenital Heart Disease

- These are cardiac anomalies arising because of a defect in the structure or function of the heart and great vessels which are present at birth.
- Two types: Acyanotic heart disease and cyanotic heart disease.



Key Points

Two types of gallstones:

- **Pigment stone**: Unconjugated pigment in the bile precipitates to form stones. It can't be dissolved. Surgical removal is the treatment of choice.
- **Cholesterol stone**: Cholesterol is a natural component of bile. Its solubility depends upon bile acid and lecithin. Cholesterol precipitates to form stones when bile acid synthesis is less than cholesterol synthesis.



Key Points

- Kayser-Fleischer (golden brown) ring at the limbus of cornea seen with a hand lens is observed in Wilson's disease.
- Sunflower cataract in Wilson's disease is due to copper deposition in lens.





Acyanotic Heart Disease

- The shunt is from left to right side of the heart.

Classification of acyanotic heart disease	
Increased pulmonary blood flow	Obstruction to blood flow from ventricles
ASD	Coarctation of aorta
VSD	Aortic stenosis
PDA	Pulmonic stenosis
	Mitral stenosis

Atrial Septal Defect (ASD)

- An abnormal opening in the atrial septum which allows oxygenated blood from the left atrium to mix with deoxygenated blood in the right atrium at a minor pressure difference.
- When blood passes through the ASD from the left atrium to the right atrium, a larger volume of blood than normal must be handled by the right side of the heart. Extra blood then passes through the pulmonary artery into the lungs leading to pulmonary hypertension and pulmonary congestion.

Types of ASD

Type	Description
Ostium primum	Opening at the lower end of the septum.
Ostium secundum	Most common type of ASD. Opening at the center of the septum.
Sinus venosus	Opening near the junction between superior vena cava and right atrium.

Clinical Manifestation

- Most infants and children are asymptomatic but over years to decades may experience the symptoms depending on type and severity of ASD
- Infant gets tired during feeding
- Child gets tired with playing/eating
- Shortness of breath
- Fatigue, Sweating, Palpitations
- Stunted growth

Management

- 20% of atrial septal defects will close spontaneously in the first year of life or as the child grows

- If the ASD is left uncorrected, then pulmonary hypertension progresses and pressure in the right side of the heart will become greater than the left side of the heart. This reversal of the pressure gradient across the ASD causes the shunt to reverse from right to left. This phenomenon is known as **Eisenmenger's syndrome**.
- Once right-to-left shunting occurs, a portion of the oxygen-poor blood will get shunted to the left side of the heart and ejected to the peripheral vascular system. This will cause signs of cyanosis.

- For defects of 3–8 mm** or smaller: Supportive medical management like digoxin, diuretics and prophylactic antibiotics up till spontaneous closure.
- If defect is >8 mm:** Surgical repair may be required.
- If spontaneous closure does not occur by school-going age, surgical repair becomes essential.
- Surgical repair:**
 - Defect may be closed with **stitches or a special patch**.
 - The material used for patch closure** - Patient's own pericardium or commercially available bovine pericardium, or synthetic material (Gore-Tex, Dacron).



Key Points

- Foramen ovale is a** structure with functional closure immediately after birth.
- Failure of the foramen ovale closure will lead to atrial septal defect.
- Patent ductus venosus results in irregular transmission of blood between **left umbilical vein and inferior vena cava**.
- After the closure, ductus venosus is known as **ligamentum venosum**.
- After the closure, ductus arteriosus is known as **ligamentum arteriosum**.
- After the closure, foramen ovale is known as **fossa ovalis**.



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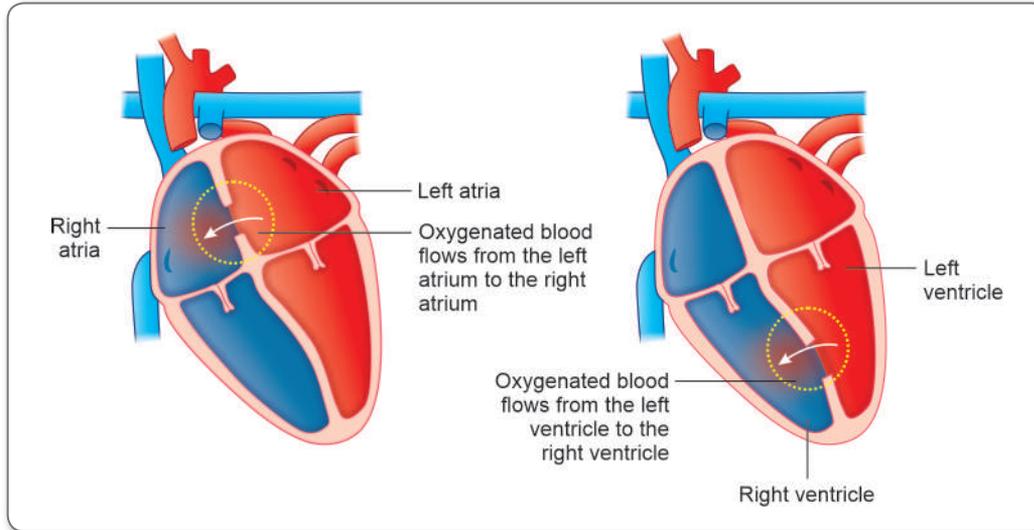


Figure 22 ■ Atrial septal defect

Key Points

- Most common heart abnormality in children is **Ventricular Septal Defect**.
- Patent ductus arteriosus results in irregular transmission of blood between pulmonary artery and aorta.
- Sternum is the best site to demonstrate capillary refilling in infants.

Ventricular Septal Defect (VSD)

- An opening in the ventricular septum which allows oxygenated blood to pass from the left ventricle, through the opening in the septum, and then mix with unoxygenated blood in the right ventricle.
- **VSDs are the most commonly occurring type of congenital heart defect**, occurring in 14–17% of babies born each year.

Clinical Manifestation

- Small VSD: Usually asymptomatic
- Moderate to large VSD: Dyspnea, tachypnea, exercise intolerance, delayed growth, feeding difficulty, recurrent respiratory tract infection, features of cardiac failure, cardiomyopathy
- Large VSD with shunt reversal: Cyanosis, clubbing, right ventricular hypertrophy

Diagnosis

- Cardiac auscultation of murmur, ECG, Chest X-ray, echo, cardiac catheterization, Doppler study.

Management

- Closure of VSD using Dacron patches.
- Pulmonary artery banding is done for large or multiple VSD.

Patent Ductus Arteriosus

- It is the persistent communication between pulmonary artery and aorta that results from failure of normal physiologic closure of the fetal ductus after birth.

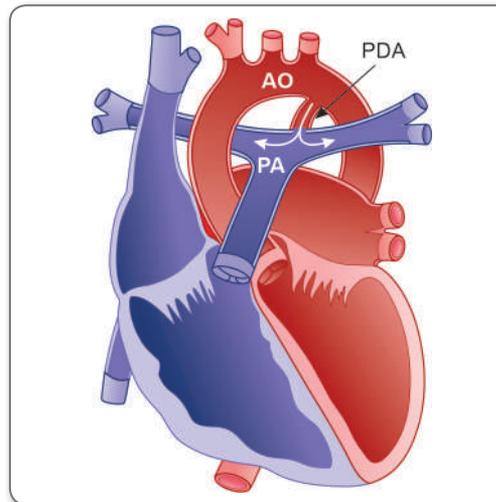


Figure 23 ■ Patent ductus arteriosus (PDA)

Clinical Manifestation

- Dyspnea on exertion, fatigue, poor growth, respiratory infection, continuous machinery murmur, increased heart rate, gallop rhythm, bounding pulse, widened pulse pressure.

Diagnosis

- ECG, chest X-ray, echo, Doppler study, cardiac catheterization.

Management

- Small PDA: Spontaneous closure
- Moderate PDA: Wait up to 2 years or 10 kg weight
- PDA with CCF: Surgical closure
- **Indomethacin** 0.2 mg/kg/dose helps in closure of PDA
- **Ibuprofen** can be given where indomethacin is contraindicated

Note

Prostaglandin infusion helps to keep the PDA patent.





Coarctation of Aorta

- Narrowing of the aorta can occur anywhere, but is most likely to happen in the segment just after the aortic arch.

Clinical Manifestation

- High blood pressure in the arms and low blood pressure in the legs.
- Delayed and weak femoral pulse and strong brachial pulse.
- Intermittent claudication, pain and weakness in legs.
- Leg may be cooler than arms.

Diagnosis

- ECG: Ventricular hypertrophy
- Chest X-ray: Prominent ascending aorta
- Barium swallow: Confirm the site of coarctation
- Echo: Shell like constriction in descending aorta
- Color Doppler: Acceleration of blood flow in the site of narrowing

Treatment

- Balloon dilation

- Resection of narrowing segment and end to end anastomosis.

Aortic Stenosis

- Narrowing or stricture of the aortic valve.

Management

- Percutaneous balloon valvuloplasty
- Aortic valve commissurotomy
- Aortic valve replacement

Pulmonic Stenosis

Narrowing at the entrance of pulmonary artery.

Mitral Stenosis

Narrowing of the heart's mitral valve.

Cyanotic Heart Disease

- The shunt present is predominantly from Right to Left leading to shunting of venous blood without passing through the lungs to be oxygenated. Unoxygenated blood circulates in arteries.

Recent Question (NORCET 2020)



32. Cyanotic spell is seen in which of the following conditions?

- Atrial septal defect
- Ventricular septal defect
- Tetralogy of Fallot
- Transposition of arteries

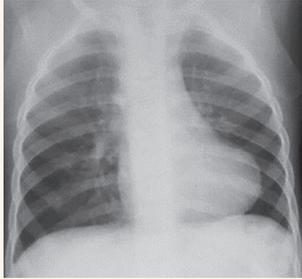
Ans. (c) Tetralogy of...



Key Points

- A child who is suffering from cyanotic heart diseases is more comfortable in knee-chest position.
- In X-ray, the heart of a child with tetralogy of Fallot appears boot-shaped.

Table 27: Manifestations, diagnosis and management of various conditions

Condition	Manifestations	Diagnosis	Management
<p>Tetralogy of Fallot: Consists of four problems</p> <ol style="list-style-type: none"> VSD Pulmonic stenosis (right ventricular outflow tract obstruction) Overtaking of aorta Right ventricular hypertrophy 	<ul style="list-style-type: none"> • Cyanosis • Shortness of breath (SOB) on exertion / feeding • Hypercyanotic spells • Clubbing of fingers • Tachypnea • Systolic thrill 	<p>Chest X-ray: boot-shaped heart</p>  <p>ECG: Right ventricular hypertrophy</p>	<p>Hypoxic spell management:</p> <ul style="list-style-type: none"> • Oxygen administration. • Knee-chest position. • Morphine: to abolish hyperpnea. <p>Surgical Management:</p> <p>Pott's procedure: Anastomosis of the upper descending aorta with left pulmonary artery.</p> <p>Waterston shunt: Side to side anastomosis of ascending aorta with right pulmonary artery.</p> <p>Brock's procedure: Pulmonary valvotomy done to correct pulmonary stenosis.</p> <p>Classic Blalock-Taussig shunt: Subclavian artery and the ipsilateral pulmonary artery are anastomosed.</p>
<p>Transposition of great arteries (TGA): Aorta arises from right ventricle and pulmonary artery arises from left ventricle. So deoxygenated blood is carried by aorta to systemic circulation and oxygenated blood returns to lung by pulmonary artery.</p>	<ul style="list-style-type: none"> • Cyanosis • Rapid breathing • Indrawing beneath the rib cage • Congestive heart failure • Ejection systolic murmur 	<ul style="list-style-type: none"> • ECG • Chest X-ray (egg on string appearance) • Cardiac catheterization 	<p>Palliative</p> <p>Non-surgical procedures to enlarge foramen ovale or balloon atrial septostomy. Prostaglandin infusion to keep PDA open.</p> <p>Total correction</p> <p>Arterial switch operation: Distal aorta is connected to pulmonary stump and pulmonary artery is connected to proximal aortic stump.</p>
<p>Truncus arteriosus: The aorta and pulmonary artery start as a single blood vessel, which eventually divides and becomes two separate arteries.</p>	<ul style="list-style-type: none"> • Cyanosis after birth • Signs of CHF • Dyspnea with feeding • Failure to thrive • Frequent respiratory infections 	<p>ECG</p> <p>Echo</p> <p>X-ray</p>	<p>Surgery</p> <ul style="list-style-type: none"> • Closing the VSD • Excising the pulmonary arteries from aorta and attaching them to the RV by means of homograft



Contd...

#7

Mother complained about the temper tantrum behavior of her 3-year-old child to a nurse. Most appropriate response from nurse is:

- Punish the child whenever the unwanted behavior occurs.
- It is normal as per her age group.
- Set limit on her behavior.
- Ignore the child completely whenever the unwanted behavior occurs.

Ans. (c) Set limit on her behavior.

Explanation: Being consistent and setting limits on the child's behavior are necessary to control behavior of toddlers. Ignoring and punishing a child may not be helpful to control behavior as they have some unseen effect on their later behaviors.

#8

After a class on first aid, teacher understood that her class was effective if the students identified which as NOT a cardinal sign of choking?

- | | |
|-----------------------|-------------|
| a. Inability to speak | b. Cyanosis |
| c. Collapse | d. Gasping |

Ans. (d) Gasping

Explanation: First three options are the cardinal signs of choking. Gasping is not a cardinal sign of choking.

#9

Nurse is teaching to a group of mothers whose children are affected with Cystic fibrosis. Nurse could understand, teaching was effective if parents correctly identified the INCORRECT statement about Cystic fibrosis as:

- It affects body's mucous secreting glands.
- Intake of high calorie, high protein and moderate fat is required.
- Postural drainage is required and to be done before meals.
- When disease is under control, large quantities of foul-smelling stool occur.

Ans. (d) When disease is under control, large quantities of foul-smelling stool occur.

Explanation: Cystic fibrosis is a condition which affects exocrine glands in the body and produce thick secretions. Because of difficulty with absorption and digestion high calorie, high protein moderate fat is needed. Postural drainage helps to remove secretions and to be done before meals to avoid the possibility of vomiting and regurgitation. If the disease is under control, stool will be soft and with little odor.

#10

Ten-month-old infant chokes and becomes unconscious. After opening the airway, what is the first step of action by the nurse?

- Look for foreign object in the mouth
- Do blind sweep
- Give back blows
- Call emergency response number

Ans. (a) Look for foreign object in the mouth

Explanation: Once the airway is open, then look for the foreign object in the mouth. Blind sweeps are not recommended. If foreign objects are not visible, then back blow is indicated.

#11

Nurse is collecting history of a child admitted with rheumatic fever. While collecting history, which among the following informations is most important?

- Recent travel history to restricted countries
- Recent history of viral infection
- Recent episode of pharyngitis
- Lack of interest in food

Ans. (c) Recent episode of pharyngitis

Explanation: There is an antigen antibody reaction usually following streptococcal sore throat which predisposes a client to sore throat.

#12

Following a class on inflammatory bowel disease, which among the following signs identified by the student regarding ulcerative colitis shows that class was effective?

- Lesion throughout the GI system
- Cobblestone appearance
- Strictures and fissures are present
- Profuse diarrhea

Ans. (d) Profuse diarrhea

Explanation: Except option d all others are the characteristics of Crohn's disease.

#13

Client came to emergency department with cardiac failure from his relative, nurse came to know that he was on digoxin therapy. Which among the following signs indicates digoxin toxicity as a cause of cardiac failure?

- Extreme bradycardia
- Profuse diarrhea
- Headache
- Chest pain

Ans. (a) Extreme bradycardia

Explanation: Digoxin decreases the heart rate; extreme bradycardia is a cardinal sign of heart failure associated with digoxin toxicity.

#14

Labor room nurse was assessing a baby following term delivery. Which among the following characteristics will be present in the baby?

- Baby is in extended posture.
- Lanugo is covering most of the body part.
- Ear cartilage has poor recoiling capacity.
- Sole creases covering the entire foot.





Ans. (d) Sole creases covering the entire foot.

Explanation: Sole creases covering the entire foot is the characteristic of term delivery. All other options are the characteristics of preterm babies.

#15

Pediatric ICU nurse was performing suction on a child. Following suction, which among the following findings needs to be observed in the child?

- a. Bradycardia
- b. Tachypnea
- c. Hypertension
- d. Jerking movement

Ans. (a) Bradycardia

Explanation: Bradycardia following suction is an expected finding because of the vagal stimulation. Other given options are not a normal observation following suction.

#16

Nurse was assessing a male neonate and observed urinary meatus was opening on the dorsal side of the penis. This condition is known as:

- a. Phimosis
- b. Epispadias
- c. Hypospadias
- d. Cryptorchidism

Ans. (b) Epispadias

Explanation: Urinary meatus on the dorsal aspect is known as epispadias and on the ventral side is known as hypospadias. Phimosis is a condition in which foreskin is too tight to be pulled back over the head of the penis. Cryptorchidism is a condition in which one or both of the testes fail to descend from the abdomen into the scrotum.

#17

CPR was going on in NICU. After 30 seconds of chest compression heart rate was 52 bpm. Adrenaline injection given to the baby. What is the normal expected finding following the injection?

- a. Increase in heart rate
- b. Hypotension
- c. Polyurea
- d. Sedation

Ans. (a) Increase in heart rate

Explanation: Adrenaline or Epinephrine injection is given to treat severe bradycardia or hypotension. Following injection, normal expected finding is rise in BP and heart rate. Adrenaline decreases renal blood flow and causes decrease in urine output. It stimulates alpha- and beta-adrenergic receptors so sedation cannot be expected.

#18

A mother with her 15-month-old child came to developmental clinic with the concern that her child is not yet walking. The nurse working in the clinic understood that according to the Denver Developmental Screen, the median age for walking is:

- a. 12 months
- b. 15 months
- c. 18 months
- d. 24 months

Ans. (a) 12 months

Explanation: According to the Denver Developmental Screen, the median age for walking is 12 months and the concern of mother is genuine and baby needs further assessment.

#19

Nurse received baby following lumbar puncture procedure. Which position needs to be given to the baby in post procedural period?

- a. Supine
- b. Prone
- c. Fowlers
- d. Knee chest

Ans. (a) Supine

Explanation: Following lumbar puncture, baby has to be placed in supine position to prevent post lumbar puncture headache. Increasing fluid intake will replenish the lost fluid during this time.

#20

Nurse educator was explaining to a junior nurse about iron deficiency anemia. Nurse educator can identify her class was effective if junior nurse identifies INCORRECT statement regarding iron deficiency anemia as:

- a. Microcytic anemia
- b. Decreased total iron binding capacity
- c. Decreased MCV
- d. Decreased hemoglobin

Ans. (b) Decreased total iron binding capacity

Explanation: In a child with iron deficiency anemia, the blood study results most likely would reveal decreased mean corpuscular volume (MCV) which demonstrates microcytic anemia, decreased hemoglobin, decreased hematocrit and elevated total iron binding capacity.

#21

An undergraduate nursing student was performing physical examination on a toddler, her educator asked her about the best method to perform physical examination on a toddler. She correctly responds as:

- a. Cephalocaudal direction
- b. System wise assessment
- c. Least to most intrusive
- d. Proximal to distal

Ans. (c) Least to most intrusive

Explanation: Best method to perform physical examination on a toddler is least intrusive to most intrusive. All other given options are inappropriate.

#22

Baby Riya underwent for ventriculoperitoneal shunt last week, which among the following signs indicates early shunt malfunction?

- a. High pitched cry, changes in pulse and respiration
- b. Pupillary changes and high-pitched cry
- c. Tense fontanelle, vomiting and irritability
- d. Headache, anorexia and irritability



Ans. (c) Tense fontanelle, vomiting and irritability

Explanation: Early signs of shunt malfunction include irritability, vomiting and tensed fontanelle. Change in pulse and respiration is a late sign.

#23

During the visit to well-baby clinic, mother asked the clinic nurse regarding weaning and introduction of home food. Which among the following food items needs to be introduced by the mother first?

- a. Smashed potato
- b. Mashed fruit
- c. Hen's egg
- d. Rice cereals

Ans. (d) Rice cereals

Explanation: Rice cereals are the best food to introduce after weaning as they are easily digestible and associated with less allergic reaction. Following cereals, mashed vegetables and fruits can be given. Introduction of egg should be delayed as it causes allergic reaction in most of the babies.

#24

While going through the case file of a patient, nurse saw diagnosis as Wilson disease. What all characteristics she needs to expect in the file; EXCEPT:

- a. Kayser-Fleischer rings in the eyes
- b. It is inherited as an autosomal recessive trait
- c. Excess copper stored in various body tissues
- d. Sweat chloride test is the diagnostic method

Ans. (d) Sweat chloride test is the diagnostic method

Explanation: Except option d all are the characteristics of Wilson disease. Sweat chloride test is the diagnostic method for cystic fibrosis. Wilson disease is diagnosed with blood levels.

#25

New-born child diagnosed with developmental dysplasia of the hip (DDH). As an experienced nurse you should understand that most common type of DDH is:

- a. Subluxable
- b. Dislocatable
- c. Teratologic hip
- d. Late dysplasia

Ans. (a) Subluxable

Explanation: Developmental Dysplasia of the Hip is a disorder of abnormal development resulting in dysplasia, subluxation, and possible dislocation of the hip secondary to capsular laxity and mechanical instability. Most common type of DDH is subluxable.

#26

Nurse was educating a mother about iron deficiency anemia. On identifying, which among the following items as best source for iron needs further education?

- a. Spinach
- b. Liver and organ meat
- c. Legume
- d. Yellow vegetables

Ans. (d) Yellow vegetables

Explanation: Shellfish, spinach, liver and other organ meats, legumes, red meat, pumpkin seeds, etc. are good source of iron. Yellow vegetables are poor source of iron.

#27

Nurse was educating parents of a child with newly diagnosed attention deficit hyperactivity disorder (ADHD). All among the following are features of ADHD; EXCEPT:

- a. Difficulty paying attention
- b. Being overactive
- c. Acting without thinking
- d. Excessive fatigue

Ans. (d) Excessive fatigue

Explanation: ADHD is a mental condition in which child has differences in brain development and brain activity that affect attention, the ability to sit still, and self-control. Except option d all other options are the characteristics of ADHD.

#28

Lucy, an 8-year-old child known case of diabetes, came to emergency complaining of nausea, vomiting, fruity-scented breath and diagnosis of diabetes ketoacidosis made. What all are the expected management for this child?

- a. Isotonic fluid infusion
- b. Potassium supplementation
- c. Sodium supplementation
- d. Insulin infusion

Ans. (c) Sodium supplementation

Explanation: Diabetes ketoacidosis is a complication of diabetes in which excessive fat destruction leads to the production of ketone bodies. Insulin deficiency, increased insulin counter-regulatory hormones and peripheral insulin resistance leading to hyperglycemia, dehydration, ketosis, and electrolyte imbalance, which underlie the pathophysiology of DKA. Except option d all other options are the treatment guideline for DKA.

#29

Senior nurse was orienting junior nurse to a neuro-surgical ICU. After the orientation, senior nurse asked the junior nurse why the head end is elevated 10-20 degree for patients with increased ICP. All among the following are correct response by the junior nurse; EXCEPT:

- a. Helps to reduce headache
- b. Maintain neutral position
- c. Decreases intra abdominal and intra thoracic pressure
- d. Helps to relieve neck stiffness

Ans. (d) Helps to relieve neck stiffness

Explanation: Except option d all are the advantages of elevating head end 10–20-degree angle for a patient with increased ICP.



Ans.

61. d
62. b
63. a
64. b
65. b
66. d
67. b
68. c
69. d
70. d
71. c
72. c
73. b
74. a
75. a
76. d
77. c

61. Identify the correct statement related to milestones achievement in child:

- Sit without support seen at 8 months of age
- Developmental milestone achieved by a 9-month-old child is creeping
- Stand without support seen at 12 months of age
- All of the above

62. At what age child can eat food without spilling, identify her gender, say her full name, can dress self with supervision?

- 2 yrs
- 3 yrs
- 4 yrs
- 5 yrs

63. When assessing physical development of a five-year-old, you would find it abnormal if he: (ESIC 2019)

- Needed to go up a stairway one step at a time.
- Could catch a large rubber ball
- Could stack up pile of six blocks.
- Could jump on one foot a few times.

Explanation: A 3-year-old child should be able to walk up the stairs using a reciprocal pattern, placing only one foot on each step, without requiring the use of a railing for support. Four-year-old child should be able to go both up and down stairs using a reciprocal pattern and no rail.

Other mentioned milestones are expected in a 5-year-old child.

64. Toilet training need to be initiated at of age.

- 15 months
- 18 months
- 20 months
- 24 months

65. A child can withhold and postpone his bowel movements at age of:

- 1 year
- 2 years
- 3 years
- 4 years

66. The nurse is aware that preschoolers often display a developmental characteristic that makes them treat dolls or stuffed animals as if they have thoughts and feelings. This is an example of:

- Logical reasoning
- Egocentrism
- Concrete thinking
- Animism

67. According to Denver Development Screening Test (DDST) an infant normally starts standing with support in:

- 6 months
- 9 months
- 12 months
- 15 months

68. A mature Pincer grasp is attained by _____ months.

- 8
- 10
- 12
- 18

Ref: OP Ghai 8th ed. p 50

Explanation: Development of pincer grasp

- 9 months radial digital grasp
- 10 months inferior pincer grasp
- 10–12 months mature pincer grasp

THEORIES OF GROWTH AND DEVELOPMENT

69. The prime principles of growth and development include all; EXCEPT:

- Growth is a continuous process
- Development occurs in orderly manner and follows a certain sequence
- Growth and development go hand in hand
- Development occurs in a Caudocephalad fashion

70. Identify the correct statement related to growth and development among the following:

- Size and mass of child's body increasing is called as growth
- Specific maturations of functions in a child is known as development
- In a child during initial period of growth and development brain growth is faster, then it became almost static
- All of the above

71. Which age group identifies illness as a punishment for misdeeds?

- Infant
- Toddler
- Preschool
- School going

72. Asperger's syndrome is a:

- Neuromuscular disease
- Degenerative disorder
- Developmental delay
- Metabolic disorder

73. The following are features of premature thelarche:

- Association with Turner Syndrome
- Asymmetrical breast enlargement
- Associated growth spurt
- Areola pigmentation

74. First sign of puberty in boys is:

- Testis enlargement
- Breast enlargement
- Penis enlargement
- Scrotum enlargement

75. When considering the principle of growth and development, remember that: (ESIC 2019)

- Although development occurs in an orderly sequence, the rate may vary between individuals.
- Most children can run before they walk
- Development occurs evenly, with periods of no growth occurring every third year.
- All children should grow in the same rate, all four-year-olds should weight within 4 kg of each other.

Explanation: Although development of child follows an orderly sequence, it is not necessary that the rate of growth and development is similar in all individuals. It is subject to individual variations. Statements given in option b, c, d are incorrect as per the principles of Growth and Development.

76. All among the following indicate principles of normal growth and development; EXCEPT:

- Proximal to distal
- Cephalocaudal
- General to specific
- Physical to psychological

Explanation: Physical to psychological is not used to describe normal growth and development. All others are the characteristics of normal growth and development.

77. In the stages of growth and development, the infancy extends from: (AIIMS Raipur Grade II 2017)

- Birth to 4 weeks
- Birth to 1 year
- 4 weeks to 1 year
- 1 to 3 years

Explanation:

- 0–28 days - Newborn
- 1 month-year: Infant
- 1–3 years: Toddlers
- 3–6 years: Preschoolers
- 6–12 years: Schoolers
- 12–18 years: Adolescents



78. Psychosocial development of children was proposed by:

- a. Erikson b. Freud
c. Piaget d. Kohlberg

Explanation: Psychosocial development was proposed by Erikson.
Psychosexual development - Freud
Cognitive development - Piaget's
Moral development - Kohlberg

79. According to Piaget's theory, 6-month-old infant will demonstrate:

- a. Negativism
b. Transductive reasoning
c. Imitation
d. Beginning of object permanence

Explanation: The beginning of object permanence will start by around 6 months of age. Object permanence is the understanding that objects continue to exist even when they cannot be observed (seen, heard, touched, smelled or sensed in any way).

80. As per Erik Erikson's stages of development, child takes decision at the age of:

- a. 3 years b. 5 years
c. 7 years d. 9 years

(Kerala PSE 1991)

Explanation: From 1–3 years, child develops autonomy and reaches peak at 3 years.

81. According to Erikson's psychosocial theory, what is the developmental task of a toddler?

- a. Autonomy/shame and doubt
b. Trust/Mistrust
c. Industry/Inferiority
d. Initiative/Guilt

(AIIMS Bhopal Grade-I 2018)

Explanation: Toddlers are 1–3 years old children. In this age group, the child is developing physically and become more mobile and discovering that he/she has many skills or abilities like putting on clothes and shoes, etc. If children in this stage are supported in their increased independence, they develop a sense of autonomy and if they are criticized or not given opportunity to assert themselves then they feel a sense of shame and doubt in their abilities.

82. Psychosexual development stage of a toddler:

- a. Phallic stage b. Anal stage
c. Genital stage d. Oral stage

Explanation: As per the psychosexual development theory proposed by Freud, toddler belongs to anal stage of development.

83. The prime principles of growth and development include all, EXCEPT:

- a. Growth is a continuous process
b. It follows the same pattern in all human beings
c. Growth and development go hand in hand
d. Development occurs in a Caudocephalad fashion

Ref: OP Ghai 8th ed. p 10

Explanation: Order of growth in human beings is cephalocaudal and distal to proximal.

84. Guidelines for assessing toilet training readiness are:

- a. Parental readiness b. Psychological readiness
c. Mental readiness d. All of these

Explanation: Guideline for assessing readiness for toilet training includes parental readiness, psychological readiness, mental readiness and physical readiness.

85. Occurrence of 'Oedipus complex' is commonly seen in:

- a. Girls between 1–3 years of age
b. Girls between 3–5 years of age
c. Boys between 1–3 years of age
d. Boys between 3–5 years of age

Ref: Textbook of Developmental Pediatrics by John E. Williams, p 266

Explanation: In Freudian psychoanalytical theory, 'Oedipus complex' is the complex of emotions aroused in a young child, typically around the age of four, by an unconscious sexual desire for the parent of the opposite sex and wish to exclude the parent of the same sex.

- The term was originally applied to **boys**, the equivalent in girls being called the Electra complex

86. The parents of a child aged 6 years who will begin school ask the nurse for anticipatory guidance. The nurse should explain that a child of this age:

(DSSSB 2010)

- a. Still depends on the parents
b. Rebels against scheduled activities
c. Is highly sensitive to criticism
d. Loves to battle

Explanation: 6-year-old child is independent in most of his activities and highly sensitive to criticism.

87. Eight-year-old Suman has difficult time making friends at school and being chosen to play on the team. He also has trouble completing his homework and, as a result, receives little positive feedback from his parents or teachers. According to Erikson's theory, failure at this stage of development results in:

- a. A sense of guilt
b. A sense of shame
c. Feelings of inferiority
d. A poor sense of self

88. To encourage an infant's cognitive and psychosocial development parents and other caregivers should:

(ESIC 2019)

- a. Allow the baby to play alone several hours each day
b. Firmly explain the rules of acceptable behavior
c. Give loving consistent care, including playing
d. Keep the baby with them at all times so he or she is safe

Explanation: Giving a loving consistent care, including playing helps in the development of higher mental functions and the behavior related development of the child.

- Allow the baby to play alone several hours each day does not help in behavioral development.
- Firmly explaining the rules increases the discipline in child.
- Keep the baby with them at all times increases the dependency in child.



Ans.

78. a
79. d
80. a
81. a
82. b
83. d
84. d
85. d
86. c
87. c
88. c



Ans.

89. a
90. a
91. d
92. b
93. d
94. b
95. d
96. a
97. b
98. b
99. c
100. a
101. b
102. d
103. a
104. d

89. WHO defines adolescent age group between:

- a. 10-19 years b. 9-14 years
c. 10-25 years d. 10-14 years

Ref: OP Ghai 8th ed. p 63

Explanation: As per WHO, adolescents are children between the age group of 10 and 19 years.

90. The primary psychosocial task during adolescence is to establish:

- a. Identity b. Intimacy
c. Autonomy d. None of these

91. The nurse teaches parents how to have their children learn impulse control and cooperative behaviors. This would be during which of Erikson's stages of development?

- a. Trust versus mistrust
b. Initiative versus guilt
c. Industry versus inferiority
d. Autonomy versus sense of shame and doubt

92. During adolescence, psychosocial development focuses on:

- a. Becoming independent b. Establishing an identity
c. Peer group relationship d. Developing initiative

93. In twin to twin transfusion syndrome, donor twin has all the signs and symptoms; EXCEPT:

- a. Oligohydramnios b. Anemia
c. Hypovolemia d. Plethora

Explanation: Donor twin is likely to have oligohydramnios, anemia, and hypovolemia and the recipient twin is likely to have polyhydramnios and plethora (abundance or excess) and to be larger than the donor twin

94. Terrible twos is the term used to describe age group of children.

- a. Infant b. Toddler
c. Pre School d. School going

Explanation: The term terrible twos is used to describe the toddler years, the period ranging from 1 to 3 year of age. It is the challenging time for parents and child as each learn to know the other better. It is an extremely important period for developmental achievement and intellectual growth.

95. Which among the following represents the most common type of accidents found in case of toddlers?

(AIIMS BPL NO 2018)

- a. Toxic ingestions b. Choking
c. Drowning d. Burns

Explanation: Burns are the most common documented cause of accidents in toddlers followed by choking, toxic ingestions and drowning. Toddlers use their newly acquired motor skills in an autonomous manner (lack of supervision).

96. Concept regarding death among preschool children is:

- a. Not a permanent condition
b. Permanent and irreversible
c. It is because of some bad doing
d. An event that eventually happens to everyone

Explanation: Preschoolers are having no cognitive ability to understand that death is not reversible. So, they think that it is a reversible condition.

ESSENTIAL NEWBORN CARE

97. Follow up care is required for the newborn with:

- a. Mongolian spots are present
b. Head circumference 39 cm
c. Milia is present
d. Umbilical cord has 2 arteries and 1 vein

Explanation: Normal head circumference is 33-35 cm in a newborn baby. 39 cm is abnormally large head circumference which is suggestive of hydrocephalus. So, this child require follow up care.

98. All are the characteristics of term baby; EXCEPT:

- a. Well curved pinna reaching up to the periphery
b. No deep creases in the soles
c. Pigmented and pendulous scrotal sac
d. Silky hair individual hair strands can be made out

Explanation: In term baby deep creases will be present in the palms and soles of the baby. All others are the characteristic of term baby.

99. The Apgar score should be assessed: (Safdarjung NO 2018)

- a. Immediately after birth and at 30 minutes after birth
b. At 5 minutes after birth and at 30 minutes after birth
c. At 1 minute after birth and at 5 minutes after birth
d. Immediately after birth and at 5 minutes after birth

Explanation: APGAR scoring is useful for quantitative assessment of newborn for respiratory, circulatory and neurologic status. APGAR is assessed at 1 minute and 5 minutes of birth. Usually newborns have lower score at birth due to depression than the score after 5 minutes of birth. The 1 minute's score determines how well the baby tolerated the process of birth. The 5-minute score determines how well the baby is doing in the outside environment (outside womb).

100. What is nurse's primary critical observation when performing an assessment for determining an Apgar score? (NCFL 2019)

- a. Heart rate
b. Respiratory rate
c. Presence of meconium
d. Evaluation of Moro reflex

Explanation: Pulse or heart rate has to be assessed first and then the respirations.

101. Which is the indicator of immediate estimate of the physical condition of the baby?

- a. New Ballard scale b. Apgar score
c. Growth chart d. Health assessment

102. In the term APGAR 'G' stands for:

- a. Grunting b. Growth
c. Gross d. Grimace

103. Apgar score system contains all of the following criteria; EXCEPT:

- a. Respiratory rate b. Color
c. Motor tone d. Heart rate

104. Which of the following is not a component of Apgar score?

(Recent Question 2015)

- a. Color of the body
b. Muscle tone
c. Heart rate/min
d. Respiratory rate per minute

Ref: OP Ghai 8th ed. p 126

“Health is the greatest of all possessions; a pale cobbler is better than a sick king.”
—Isaac Bickerstaff

8

NURSING EDUCATION



SYNOPSIS

EDUCATION

It brings change in behavior of an individual in a desirable manner. It aims at all-round development of an individual.

Philosophies of Education

The term ‘Philosophy’ has been derived from two words, i.e., “philos” means ‘love’ and “sophia” means ‘wisdom’. Philosophy means love for wisdom.



Traditional Philosophies

Table 1: Traditional Philosophies: Some facts

Character	Naturalism	Idealism	Pragmatism (Experimentalism)	Realism
Exponents	<ul style="list-style-type: none"> • Aristotle • JJ Rousseau 	<ul style="list-style-type: none"> • Plato is father of Idealism • Socrates, Kant, Hegel, Guru Nanak, Tagore, Mahatma Gandhi, Dayananda and others. 	<ul style="list-style-type: none"> • William James is the father of Pragmatism • John Dewey, S. Kil Patrick • Margaret H and Mead 	<ul style="list-style-type: none"> • J Friedrich Herbert • Herbert Spencer • Franklin Bobbitt
Fundamental principles	<ul style="list-style-type: none"> • Separate nature from God • Human life is part of nature • Emphasize ‘matter and the physical world’ • Ignore spirituality and supernaturalism 	<ul style="list-style-type: none"> • Ideas or thoughts make up fundamental reality • Ultimate reality is spiritual rather than physical, mental or material • The only real things are mental entities, not physical things 	<ul style="list-style-type: none"> • It is the product of practical experiences of life • Based on practical utility. • Emphasize is on action rather than on thought • Experimental method of science 	<ul style="list-style-type: none"> • Correspondence and sensation (as we see it). • What is true and real in daily life is admissible • Opposes to idealism • Against spiritualism
Aims of Education	Self-realization, Self-expression, Self-preservation, Struggle for existence	Idealism emphasizes the glory and grandeur of human life.	Creation of new values, activity and experience, personal and social adjustment, reconstruction of experience, all-round personality development	Man leads a happy and comfortable life through education. To develop memory of the child.
Curriculum	No fixed curriculum. Every child has the right to determine his/her curriculum. Learn directly from nature through experience	Based upon ideas and ideals. Language, literature, social studies, science and mathematics are included	Curriculum is fixed in advance at the beginning itself. Utilitarian curriculum includes subjects that impart knowledge and various types of skills. Practical subjects like social studies, physics, maths and hygiene are included at later stage.	Subjects of physical world: mathematics, science and social science

Contd...



- **Levels of curriculum planning**
 - **Societal curriculum:** Planned for large group of students in a specific program, e.g., GNM or BSc Nursing.
 - **Institutional curriculum:** Planned for a group of students who will study in a particular institution for specific period of time.
 - **Instructional curriculum:** Consists of content and activities planned for a specific period of time (day by day and week by week).
- **Phases of curriculum development**
 - Development phase: Planning and developing
 - Implementation phase: Management and implementation
 - Evaluation phase: Assessment of teaching and learning process

- **Cognitive domain (Knowledge)**
- **Conative or psychomotor domain (Skill)**
- **Affective domain (Attitude)**

Bloom's Taxonomy of Educational Objectives (1956)

- It is one of the most widely used ways of organizing levels of expertise.
- **Cognitive Domain**
 - The cognitive domain involves knowledge and the development of intellectual skills
 - This includes knowledge, comprehension, application, analysis, synthesis and evaluation
- **Conative (psychomotor) domain**
 - Psychomotor domain includes physical movement, coordination, and use of motor-skill areas.
- **Affective Domain**
 - Affective domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, and attitudes.

EDUCATIONAL OBJECTIVES

Educational or learning objectives is defined as "Desired end results or anticipated end results"

Taxonomy of Educational Objectives

It is a systematic organization of objectives into three domains, i.e.,

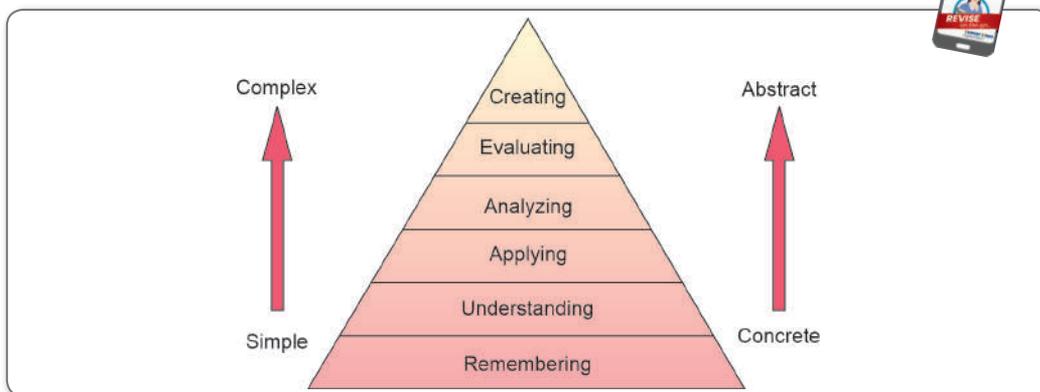


Figure 1 ■ Cognitive domain

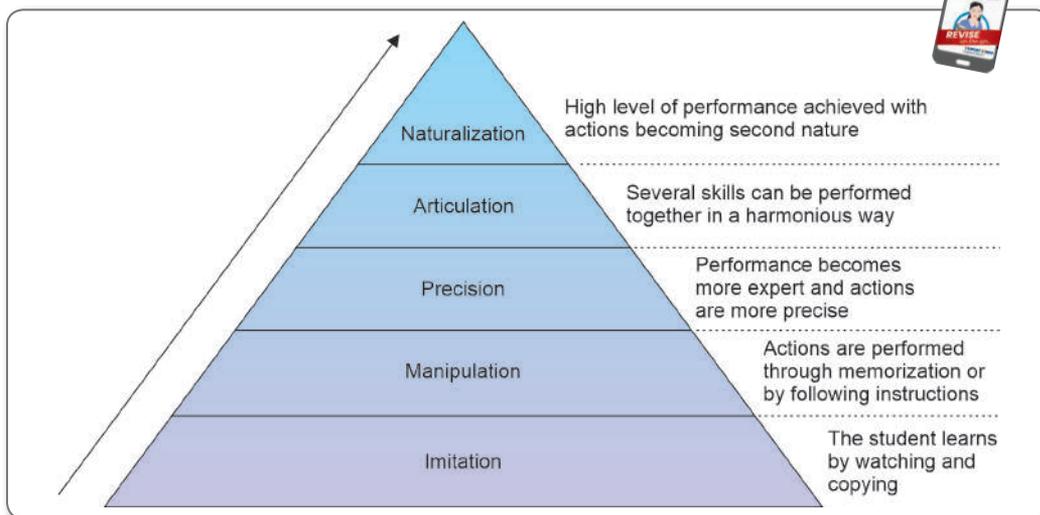


Figure 2 ■ Psychomotor domain (Based on Dave, 1975)



Recent Questions (INC PHD 2020)

1. **Basic cognitive domain verb among the following is:**

- Receiving
- Responding
- Applying
- Organizing

Ans. (c) Applying

2. **Which among the following shows higher level of domain verb?**

- Remembering
- Receiving
- Imitation
- Creating

Ans. (d) Creating

3. **Nursing student working is a palliative care setting spent her time with the patient who all are in the end stage of the life. She always spent time with dying patient's last 5-10 min. What kind of educational domain verb she achieved?**

- Characterization
- Receiving
- Responding
- Valuing

Ans. (a) Characterization



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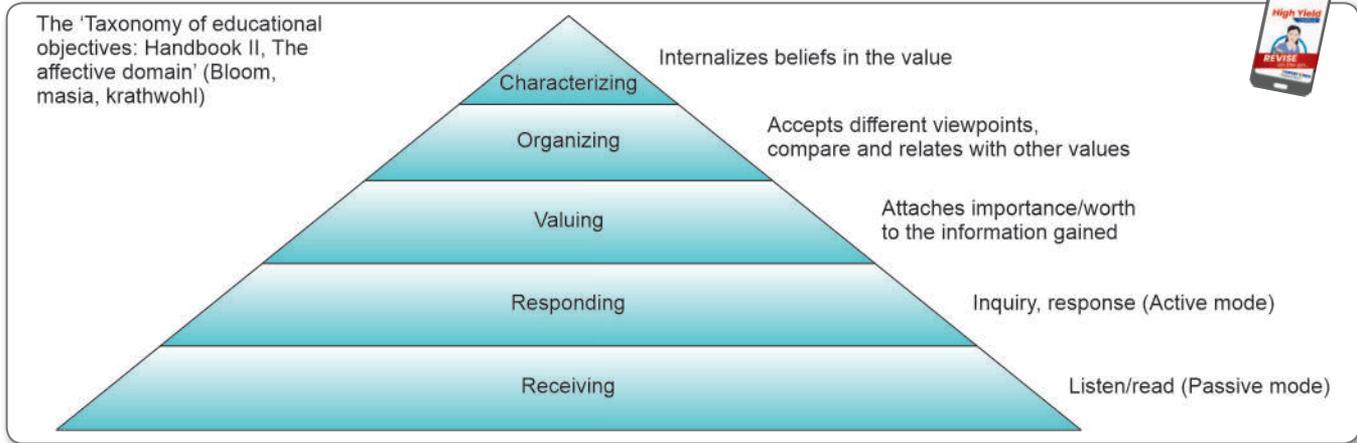


Figure 3 ■ Affective domain

AUDIO-VISUAL AID

Audio-visual-aid: It is an instructional device in which message can be heard as well as seen.

Classification of A-V Aids

Auditory Aids

Radio, recordings, mike, programs, megaphone, and gramophone

Visual Aids

- **Non-projected/unprojected:** Model, 3-D materials, pictures, charts, flannel graph, boards, cartoons,

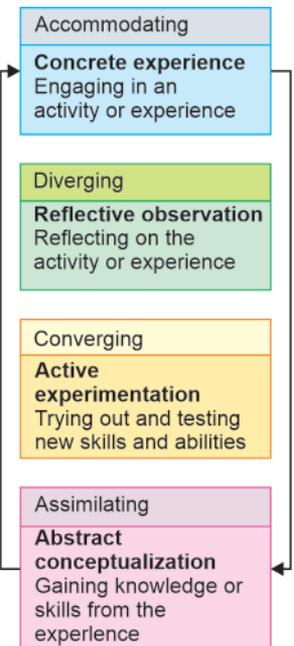
maps, photographs, flashcards, illustrations, posters and printed materials.

- **Projected aids:** Epidiascope, slide projector, overhead projector, film projector, opaque projector.
- **Audio-visual aids:** Television, video, sound motion picture.
- **Aid through activity:** Field trip, models, collection of material and exhibition.
- **Traditional media:** Puppets, dramas, folk songs and folk dance.



Table 3: Two- and three-dimensional AV aids

Two-dimensional AV aids	Three-dimensional AV aids
<ul style="list-style-type: none"> • Printed materials • Chart • Posters • Graph • Photos and map 	<ul style="list-style-type: none"> • Model <ul style="list-style-type: none"> ■ Solid model (Globe, clay model) ■ Cutway and X-ray models, e.g., Cross sectional model of human body ■ Working models (Circulatory system model with working motor) ■ Sand models (community area, forest area) ■ Scale models (models of organs of body) • Exhibit • Specimen • Mock-up • Moulage • Objects • Realia (Natural and preserved) • Diorama • Puppets



Cycle of Kolb's learning styles



Key Points

- The most commonly available aid in the classroom situation is blackboard
- **Black, Blue and Green** are best colors to write on the transparencies
- Flannel boards are covered with rough khadi. The cut outs, drawings and other illustrations are placed on the board.
- Epidiascope is the projected aid for projecting opaque objects
- Flash card is a method which consists of series of cards that are flashed one after another. Sizes of the cards are 10" x 12" or 22" x 28"
- Flashcards are ideal for a group of 20–30 people



Characteristics of Good Teaching A-V Aids

- Meaningful
- Purposeful
- Accuracy in every aspect
- Simple
- Cheap
- Improvised
- Large size
- Up-to-date
- Easily portable
- According to mental level of the students
- Motivates the learners

Principles of A-V Aids

- Principle of selection
- Principle of preparation
- Principle of physical control
- Principle of proper presentation
- Principle of response
- Principle of evaluation

Table 4: Differences between pedagogy and andragogy

Pedagogy	Andragogy
The learner is dependent upon the instructor for all learning	Self-directed learning
Teacher is responsible for what is taught and how it is learned	Learner is responsible for his own learning
Teacher evaluates learning	Self- evaluation
Experience of the teacher is most influential	Adults are rich resource for one another
Process of acquiring prescribed subject matter	Learners perform a task, solve problem relevant to real-life tasks
Motivated by external pressures	Self-motivating factors: recognition, better quality of life, etc.

PRINCIPLES OF TEACHING

- Principle of Creativity
- Principle of Looking ahead
- Principle of Flexibility and cooperation
- Principle of Diagnostic and remedial teaching
- Principle of Linking teaching with actual life
- Principle of Planning
- Principle of Aim
- Principle of Interest or motivation
- Principle of Sympathy and kind atmosphere
- Principle of Activity or learning by doing

Teaching Methods

Table 5: Teaching methods and its significance

Teaching methods	Significance
Lecture method	<ul style="list-style-type: none"> • Controlled and information centered approach • Teacher talks and Students are passive listeners • The teacher transmits information to a large group (Ideal for a large group of students) • Also known as “autocratic teaching strategy” • Most commonly used method of teaching



Contd...



MAXIMS OF TEACHING

- Known to unknown
- Easy to difficult
- Simple to complex
- Concrete to abstract
- Particular to general
- Analysis to synthesis
- Whole to parts
- Empirical to rational
- Psychological to logical
- Actual to representative

PEDAGOGY VS ANDRAGOGY

- **Pedagogy:** Pedagogy is the study and theory of the methods and principles of teaching. It is a child-focused teaching approach.
- **Andragogy:** It refers to method and principles used in adult education.



Key Points

- Pedagogy is a child-focused teaching approach.
- Andragogy is adult-focused teaching approach.



Recent Questions (INC PhD 2021)

- 4. All among the following statements are true about andragogy; EXCEPT:**
- They are participating in learning process for specific needs and reason
 - They possess their own preferred learning style.
 - Continuous motivation and reinforcement are needed
 - They have broad and diverse range of experience

Ans. (c) Continuous motivation and reinforcement are needed.

- 5. Group discussion is suitable for a group of people.**
- 3–6
 - 4–8
 - 6–12
 - 10–16

Ans. (c) 6–12



Recent Question (INC PhD 2020)

- 6. Didactic method of teaching is:**
- Lecture
 - Group discussion
 - Demonstration
 - Role play

Ans. (a) Lecture





21. **Nursing Educational Research is required to:**
- Improve self-image of nursing professionals
 - Ensure evidence-based nursing practice
 - Persuade young people to come into nursing profession
 - Uphold professional dignity

EDUCATIONAL MEDIA (AV AIDS)

22. **The reproduction of the essential features of a real-life situation is called:** (AIIMS Raipur NO 2019)
- Exhibition
 - Module
 - Simulation
 - Demonstration

Explanation: A simulation is an approximate imitation of the operation of a process or system. The model is a well-defined description of the simulated subject, and represents its key characteristics. Simulation is one of the best methods to teach clinical skills for nursing students.

23. **Video conferencing can be classified as one of the following types of communication:** (AIIMS Raipur NO 2019)
- Visual one-way
 - Audio-Visual one-way
 - Audio-Visual two-way
 - Visual two-way

Explanation: Video conferencing means to conduct a conference between two or more participants at different sites by using networks to transmit audio-video data. So, video conferencing is an audio-visual two-way type of communication.

24. **One form of graphic presentation for health education is:** (AIIMS Nagpur NO 2018)
- Notice board
 - Charts
 - Poster
 - Blackboard

Explanation: A **chart** is a graphical representation of data, in which "the data are represented by symbols, such as bars in a bar chart, lines in a line chart, or slices in a pie chart." **Poster** consists textual and graphic elements, images which designed to be eye catching and informative.

25. **Which of the following is NOT a visual aid used in health education?** (AIIMS-BBS SNO 2019)
- Textbooks
 - Posters
 - Film strips
 - Audio cassettes

26. **Facts and ideas arranged for expressing the process or development of an issue to the point of its resolution over a period of time is:**
- Narration chart
 - Strip chart
 - Cycle chart
 - Evolution chart

27. **A map that describes the political divisions of the world, continents and nations is known as:**
- Physical map
 - Relief map
 - Political map
 - Weather map

28. **Which of the followings is NOT an activity aid?**
- Field trip
 - School museum
 - Role play
 - Graphs

29. **An equipment that projects the real magnified image on a screen directly from pictures and drawings on paper is:**
- Slide projector
 - LCD projector
 - Episcope
 - Microscope

30. **Most common AV aid used for educating general public is:**
- Audio tape
 - Radio
 - CD system
 - Tape recorder

31. **The most essential body language in classroom teaching is:**
- Eye contact
 - Controlled movement
 - Humorous
 - Straight posture

32. **Which of the following is the most popular method of delivering distance learning courses at present?**
- Video conferencing
 - Web-based learning
 - Teleconferencing
 - Internet

33. **An overhead projector works by:**
- Refraction of light
 - Reflection of light
 - RGB color method
 - CMYK color method

34. **The blind spots of the blackboard are in the:**
- Lower third part of the board
 - Corners of the board
 - Lower one fourth of the board
 - Upper left side of the board

35. **Which one of the following is NOT a part of electronic media?**
- Radio
 - Brochure
 - Film
 - Television

36. **The oldest and cheapest audio-visual aid that is widely accepted in teaching is:**
- Charts
 - Chalkboard
 - Flip cards
 - PPT

37. **Mock up is one of the examples of:**
- 3 - Dimensional aid
 - Project aid
 - Field trip
 - None of these

38. **The ideal size of a flashcard should be:**
- 10" × 12" or 22" × 28" in size
 - 12" × 12" or 20" × 20" in size
 - 8" × 12" or 18" × 24" in size
 - 11" × 16" or 21" × 26" in size

39. **A board which is used both for informational and educational purposes is called:**
- Whiteboard
 - Blackboard
 - Flannel board
 - Bulletin board

PRINCIPLES & MAXIMS OF TEACHING

40. **Which of the following is NOT the maxim of teaching?**
- Known to unknown
 - Complex to simple
 - Concrete to abstract
 - Analysis to synthesis

PEDAGOGY VS ANDROGOGY

41. **Andragogy refers to:**
- Child learning
 - Adult learning
 - Learning by doing
 - Practical learning

PRINCIPLES OF TEACHING

42. **Which of these is NOT a conventional philosophy?**
- Idealism
 - Naturalism
 - Pragmatism
 - Existentialism
43. **Which philosophy believes that ultimate goal of human activities is the realization of human mind in his or herself?**
- Idealism
 - Pragmatism
 - Realism
 - Existentialism



Ans.

- b
- c
- c
- b
- d
- a
- c
- d
- c
- b
- a
- c
- b
- b
- b
- a
- a
- d
- b
- b
- d
- b
- a



Ans.

44. d
45. d
46. a
47. d
48. b
49. d
50. b
51. c
52. a
53. d
54. b
55. d
56. b
57. c
58. c
59. a
60. a
61. b
62. a
63. b
64. b
65. c
66. b
67. b
68. c
69. d
70. d

44. Which of the following is not the principle of Lesson Planning?

- a. Flexible
b. Mastery and adequate training on the topic
c. Active student participation
d. Single teaching method

45. In which type of objective, breaking down of professional functions into components (activities) is done that together indicate the nature of the functions?

- a. Central
b. Specific
c. Intermediate
d. Tertiary

46. Which philosophical thought states that 'ultimate reality is spiritual rather than physical, mental rather than material'?

(Tutor Exam 2015, AIIMS, Rishikesh)

- a. Idealism
b. Realism
c. Pragmatism
d. Spiritualism

47. John Dewey was a proponent of:

- a. Spiritualism
b. Idealism
c. Realism
d. Pragmatism

48. Who among the following proposed that education be designed on the basis of a theory of experience?

- a. Socrates
b. John Dewey
c. Aristotle
d. Jean Piaget

49. All of the following are traditional philosophies of education; EXCEPT:

- a. Idealism
b. Pragmatism
c. Naturalism
d. Essentialism

METHODS OF TEACHING

50. The best method to teach a patient any skills, such as using inhaler, is by:

(AIIMS BBS NO 2018):

- a. Lecture
b. Demonstration
c. Discussion
d. Panel session

Explanation: The best method to teach a patient any skills, is by doing and showing the things. Demonstration is the process of performing the procedure the way teacher expects the learner to practice.

51. Which of the following is NOT an autocratic method of teaching?

- a. Lecture
b. Demonstration
c. Discussion
d. Tutorial

52. Teaching method in which students learn to do critical thinking through discussion and interaction and develop higher analytical cognitive skills is:

- a. Seminar
b. Symposium
c. Panel discussion
d. Lecture

53. Which of the following is not a clinical method of teaching?

- a. Case methods/case study
b. Nursing rounds and reports
c. Process recording
d. Seminar

54. Method of teaching in which an excursion to the patient's area is arranged to provide learning experience to the students is:

- a. Case presentation
b. Nursing rounds
c. Morning report
d. Process recording

55. A written verbatim account of a visit for the purpose of bringing out the interplay between the patient and the nurse:

- a. Morning report
b. Evening report
c. Case study
d. Process recording

56. The most essential quality of an effective teacher is:

- a. A strict personality
b. Communication skill
c. Friendly attitude
d. Superior knowledge of the subject

57. Which method of teaching would be most suitable to teach nursing care of children with "Mental Retardation" for a class of 100 nursing students?

- a. Group discussion
b. Lecture cum discussion
c. Problem-solving
d. Web-based learning

58. A group of 10 people are speaking on a topic of common interest in an educational programme. This method is best known as:

- a. Workshop
b. Panel discussion
c. Group discussion
d. Lecture

59. All that is learnt during educational activities that is not a designated part of official curriculum is known as the:

- a. Extra curriculum
b. Observed curriculum
c. Hidden curriculum
d. Experienced curriculum

60. The demonstration on "Neurological examination" would be most useful, if done in a group of:

- a. 10
b. 20
c. 25
d. 30

61. Which one of the following is NOT among the maxims of Teaching?

- a. Analysis to synthesis
b. General to particular
c. Easy to difficult
d. Concrete to abstract

62. Lesson plan is prepared by the:

- a. Teacher
b. Administrator
c. Student
d. Principal

63. Which one of the following is not a quality of a good teacher?

- a. Good Motivator
b. Intolerance
c. Leadership
d. Mastery of the content

64. Which of the following learning domain is a skill domain?

- a. Cognitive
b. Affective
c. Conative
d. None of these

65. Which of the following learning domains influence nursing practice?

- a. Cognitive and conative
b. Conative and affective
c. Affective and cognitive
d. Cognitive, conative and affective

66. Panel discussion method was introduced by:

- a. William James
b. Harry A. Overstreet
c. W.F. Skinner
d. Jean Piaget

67. Preferably, panel discussion consists of:

- a. 3-5 members
b. 4-8 members
c. 6-9 members
d. 6-10 members

68. Role of the participants in seminars include:

- a. Observe the speaker
b. Observe and note the information
c. Analyze, discuss and critique the content
d. Listen to the speeches and prepare an article for publication

69. Who decides the topic of any seminar?

- a. Secretary
b. Participants
c. Chairperson
d. Organizer

70. Ideally, the duration of a seminar presentation is:

- a. 20-30 minutes
b. 30-45 minutes
c. 45-60 minutes
d. 60-120 minutes

“Ill-health of body or of mind, is defeat. Health alone is victory.”
—Thomas Carlyle

NURSING RESEARCH AND STATISTICS



SYNOPSIS

INTRODUCTION

Nursing research provides evidence used to support nursing practices, education, administration and management.

DEFINITION

Nursing research is a planned attempt to increase nursing knowledge by the discovery of new facts through systematic enquiry.

STEPS IN THE QUANTITATIVE RESEARCH PROCESS

Conceptual Phase

- Formulating and delimiting the problem.
- Reviewing the literature.
- Developing a theoretical framework.
- Identifying the research variables.
- Formulating hypotheses.

Design and Planning Phase

- Selecting a research design.
- Specifying the population.
- Operationalizing the variables.
- Conducting the pilot study/making revisions.

Empirical Phase

- Selecting the sample
- Collecting the data
- Organizing data for analysis

Analytic Phase

- Analyzing the data
- Interpreting the results

Dissemination Phase

- Communicating results

STEPS IN THE QUALITATIVE RESEARCH PROCESS

- Define/clarify broad topic
- Review of the literature
- Identify site/setting
- Obtain access
- Obtain and test equipment
- Begin data collection/analysis
- Identify themes/categories
- Triangulation/saturation
- Formulate hypotheses/theories
- Communicate findings

RESEARCH PROCESS

Research Problem

- It is the first step in research process.
- A research problem is a question that researcher wants to answer or a problem that a researcher wants to solve.

Review of Literature

Review of Literature (ROL) is a systematic way of presentation of relevant references along with brief findings in the specific juncture for the proposed study or research proposal.

Sources of Review of Literature

- **Primary sources:** A primary source provides direct or first-hand evidence about an event, object, person, or work of art. Examples include:
 - Historical and legal documents
 - Original research articles found in Scholarly journals
 - Published thesis
 - Eyewitness accounts
 - Results of experiments
 - Statistical data
 - Pieces of creative writing
 - Audio and video recordings, speeches, and art objects

Recent Questions (INC PhD 2020)

1. Which among the following is not an appropriate research area?
- a. Abortion mortality as a method of contraceptive
 - b. Postpartum contraceptive methods
 - c. Initiation of breastfeeding immediately after delivery
 - d. Low birth weight babies and their outcomes

Ans. (a) Abortion mortality as a method of contraceptive.

2. In Vancouver style et al is used after how many authors?
- a. 3
 - b. 6
 - c. 8
 - d. 10

Ans. (b) 6



Key Point

- A research proposal is a document proposing a research project.





- Interviews, surveys, and fieldwork
- Internet communications via E-mail, blogs, LISTSERV, and newsgroups
- **Secondary sources:** Secondary sources describe, discuss, interpret, comment upon, analyze, evaluate, summarize, and process primary sources. For example:
 - Articles in newspapers or popular magazines.
 - Book or movie reviews.
 - Articles found in scholarly journals that discuss or evaluate someone else's original research.
- **Types of sources**
 - **Print sources:** Information gathered from printed materials including journals, magazines, textbooks, etc.
 - **Electronic sources:** Information gathered from electronic media such as internet, CD, online journals, blogs, etc. Some of the electronic databases for nursing research are given below.
 - **Ovid MEDLINE:** Literature in the fields of medicine, nursing, dentistry, and preclinical sciences.
 - **Ovid CINAHL (Cumulative index to Nursing allied Health Literature):** Literature related to nursing and allied health disciplines including medical records, physical and occupational therapy.
 - **PubMed:** The US National library of medicine database of biomedical citation and abstracts that is searchable on the website at no cost.
 - **MEDLINE** is the largest component of Pubmed.
 - Cochrane Library.

Research Variables

A **variable** is a measurable characteristic that varies. It may change from group to group, person to person, or even within one person over time.

- **Dependent variables:** These are the variables which changed according to the independent variable, e.g., A study to assess the effect of hand grip exercises on BP of prehypertensive client. Here dependent variable is BP of prehypertensive client.
- **Independent variables:** These are the variables manipulated by the researcher. Researcher has good control over these variables, e.g., A study to assess the effect of hand grip exercises on BP of pre-hypertensive client. Here independent variable is hand grip exercises
- **Extraneous variables:** These are factors in the research environment which may have an effect on the dependent variable(s) but which are not controlled. Extraneous variables may damage a study's validity, making it impossible to know whether the effects were caused by the independent or some extraneous (not measured) factor. If they cannot be controlled, extraneous variables must at least be taken into consideration when interpreting results.

- **Confounding variables:** Extraneous variables become confounding variable if there is an academic evidence that the extraneous variable (which was not measured in the study) has influence (or relationship) on dependent variable.
- **Continuous variables:** These variables can take an infinite range of values along a continuum, e.g., weight in kg.
- **Discrete variables:** They are having a finite number of values between two points, e.g., number of children
- **Categorical variables:** They do not represent quantity or numerical value, e.g., Nominal variable: Gender (male, female), Religion (Hindu, Muslim, Christian), etc.
- **Ordinal variables:** Severity of disease (mild, moderate, severe), Socio-Economic status, e.g., poor, middle class, upper middle class, affluent.

Examples to Explain all These Four Variables

- **Study title:** The impact of teaching style (lectures/ seminars) on exam performance of students.
- **Independent variable (IV):** Teaching style (either lectures or seminars).
- **Dependent variable (DV):** Exam performance of students (statistics exam ranging from 0 to 100 marks).
- **Extraneous variables:** Quality of lecturer and tiredness of students; the researcher was not indented to measure these variable in his/her research.
- **Confounding variables:** If researcher found academic evidence (from research articles from scholarly journals) that quality of the teacher or tiredness of student will affect the exam performance, then **these two variables may be called confounding variables**. Because the researcher cannot be sure that only the independent variable (teaching style) has caused changes in students' performance.

Objectives

- A research objective is a clear, concise, declarative statement which provides direction to investigate the variables.
- The objectives of a research project summarize what is to be achieved by the research.

Characteristics of research objectives:

- A well-framed objective will be SMART
 - S - Specific
 - M - Measurable
 - A - Attainable
 - R - Realistic
 - T - Time-bound

Types of research objectives:

- **General objectives:** Broad statement of what is to be achieved.



Key Points

- A **literature review** is everything that is known about subject.
- In quantitative research studies, the literature review should occur early in the research process.



Recent Question (INC PhD 2020)

3. Characteristics of research objective are all; EXCEPT:
- a. Measurable
 - b. Testability
 - c. Time bound
 - d. Equivocal

Ans. (d) Equivocal



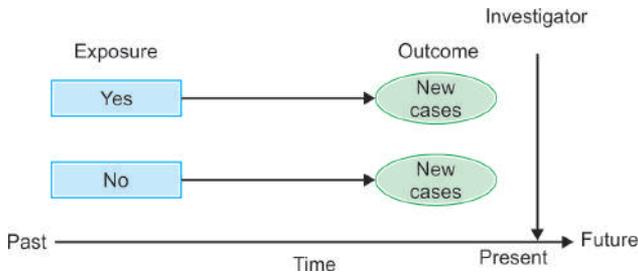
Key Point

- A research objective must be SMART (Specific, Measurable, Attainable, Realistic and Time-bound).



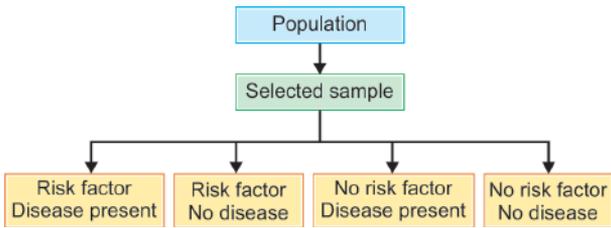


7. Identify the epidemiological study design.



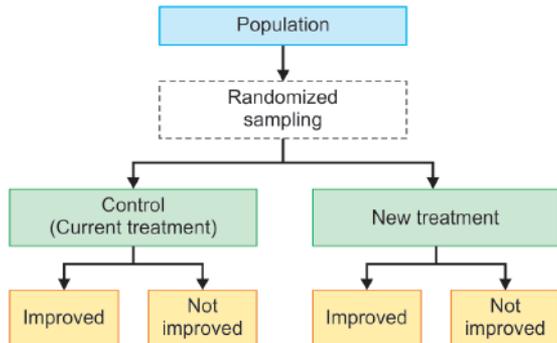
- a. Prospective Cohort study
- b. Case Control study
- c. Retrospective Cohort study
- d. Nested Case Control study

8. Identify the epidemiological study design.



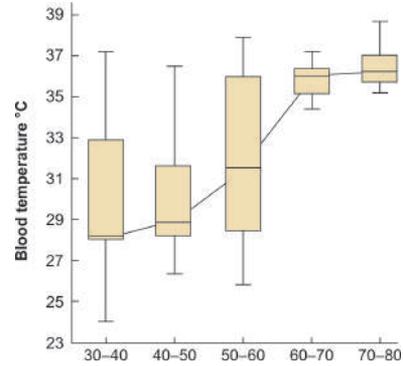
- a. Prospective Cohort study
- b. Cross Sectional study
- c. Retrospective Cohort study
- d. Nested Case Control study

9. Identify the epidemiological study design.



- a. Prospective Cohort study
- b. Meta-analysis
- c. Retrospective Cohort study
- d. Randomized Control Trial

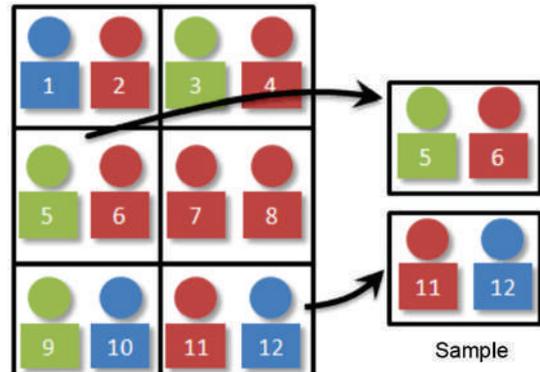
10. Identify the statistical diagram shown in photograph. [AIIMS November 2015] [Recent Question 2015]



- a. Funnel plot
- b. Forest plot
- c. Stem and Leaf plot
- d. Box and Whisker plot

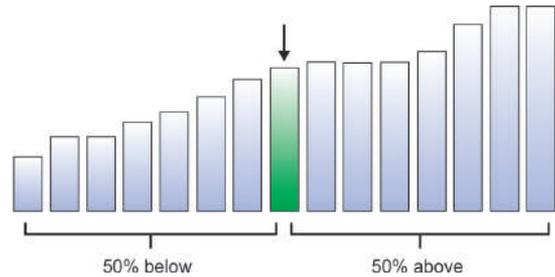
11. Type of sampling shown in figure is:

[Recent Question 2015]



- a. Simple random sampling
- b. Systematic random sampling
- c. Stratified random sampling
- d. Cluster random sampling

12. Identify parameter represented by 'Black arrow'.



- a. Mean
- b. Median
- c. Mode
- d. Range



Ans.

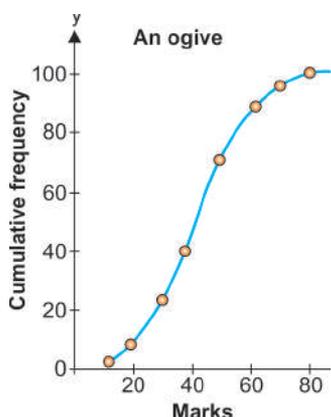
- 7. c
- 8. b
- 9. d
- 10. d
- 11. d
- 12. b



Ans.

- 13. d
- 14. a
- 15. b
- 16. c
- 17. d
- 18. c

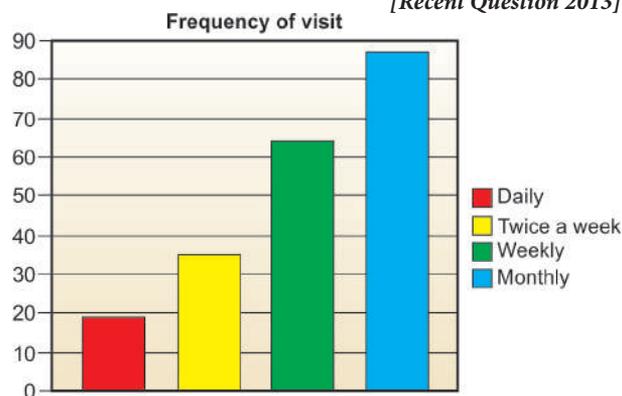
13. Identify the statistical diagram shown.



- a. Frequency polygon
- b. Histogram
- c. Line diagram
- d. OGIVE

16. Identify the statistical diagram shown.

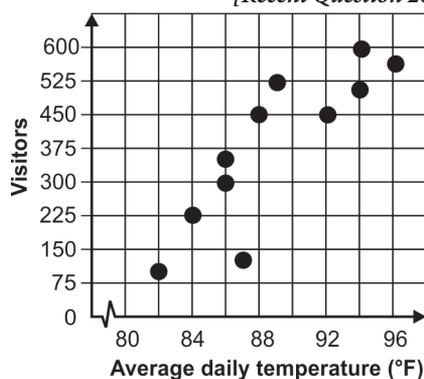
[Recent Question 2013]



- a. Histogram
- b. Pie chart
- c. Bar diagram
- d. OGIVE

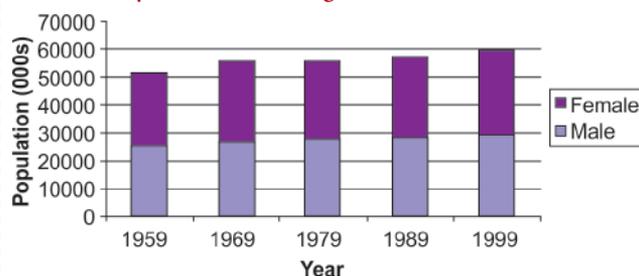
14. Identify the statistical diagram shown.

[Recent Question 2014, 2016]



- a. Scatter diagram
- b. Cumulative frequency diagram
- c. Line diagram
- d. Pictogram

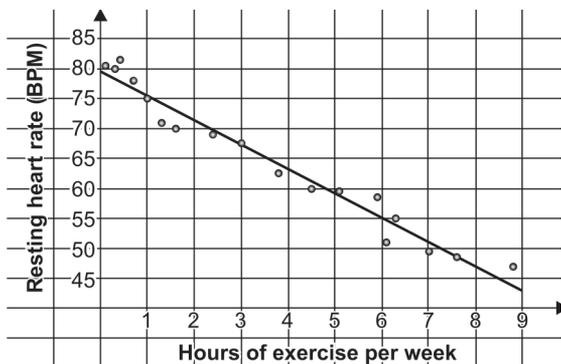
17. Identify the statistical diagram shown.



- a. Simple bar chart
- b. Multiple bar chart
- c. Cluster bar chart
- d. Component bar chart

15. In the given scatter diagram, correlation coefficient 'r' will lie between

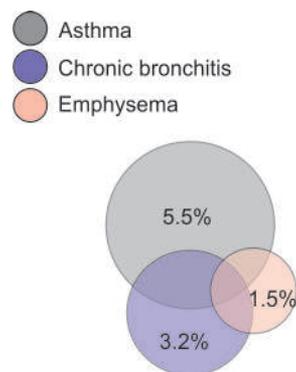
[Recent Question 2014]



- a. 0 and 1
- b. 0 and -1
- c. 1 and -1
- d. 0 and 100

18. Identify the diagram shown.

[Recent Question 2012]



- a. Stem and leaf plot
- b. Pie chart
- c. Venn diagram
- d. Flow chart



Ans.

79. a
80. b
81. b
82. a
83. a
84. b
85. b
86. c
87. a
88. d
89. b
90. b
91. a
92. b
93. d
94. c
95. b
96. a
97. c
98. b
99. b

79. Biasness of a study can be reduced by controlling which of the following variables?

- a. Extraneous b. Independent
c. Dependent d. Demographic

80. _____ refers to the influence of a single independent variable.

- a. Confounding effect b. Main effect
c. Extraneous effect d. Proactive effect

81. Variable that changes due to the influence of another variable is known as the:

- a. Independent variable b. Dependent variable
c. Extraneous variable d. Confounding variable

82. The variables that are not studied in the experiment but may affect the dependent variable are known as:

- a. Independent variable b. Extraneous variable
c. Dependent variable d. Categorical variable

HYPOTHESIS

83. Which scientific method focuses on testing hypotheses developed from theories?

- a. Deductive method b. Inductive method
c. Hypothesis method d. Pattern method

84. Which scientific method often focuses on generating new hypotheses and theories?

- a. Deductive method b. Inductive method
c. Hypothesis method d. Pattern method

85. Identify the type of hypothesis from the following statement: "Two hourly position change is more effective than four hourly position change in prevention of pressure ulcer in bed-ridden patients."

- a. Simple, research b. Simple, directional
c. Complex, casual d. Complex, associative

86. Identify the type of hypothesis from the following statement: "Emotional well-being is influenced by the self-esteem, degree of social support and financial status in women breast cancer survivors."

- a. Simple, research b. Simple, directional
c. Complex, non-directional d. Complex, directional

87. Identify the type of hypothesis from the following statement: "The lower the blood sugar level, the lesser is the risk of infection among diabetic patients"

- a. Simple, associative
b. Simple, causal
c. Causal, null
d. Causal, directional

88. Identify the type of the following hypothesis. "Hypertensive patients who receive exercise therapy report better blood pressure control and require less drug dose than hypertensive patients not receiving exercise therapy.":

- a. Simple, directional hypothesis
b. Simple, non-directional hypothesis
c. Complex, non-directional hypothesis
d. Complex, directional hypothesis

89. What type of hypothesis is the following? "High-fiber diet is related to increased bowel movement and lower cholesterol levels.":

- a. Complex, directional, causal
b. Complex, directional, associative
c. Simple, non-directional, research
d. Simple, directional, causal

90. Statement of the expected relationship between two or more variables is known as the:

- a. Assumption b. Hypothesis
c. Problem statement d. Research question

91. The hypothesis that begins with specific observations and move towards generalizations, is called as:

- a. Inductive
b. Deductive
c. Simple
d. Complex

92. Hypothesis does not:

- a. Explain the relationship between variables
b. Measures the differences between variables
c. Give direction to data collection
d. Give direction to data analysis

93. Which of the following is not true for hypothesis?

- a. It is a prediction of relationship between variables
b. It is the researcher's anticipation regarding the study
c. A hypothesis is a tentative generalization
d. It cannot be tested

94. Which of the following statements meets the criteria for the complex hypothesis?

- a. There is significant negative correlation between years of experience and level of burnout symptoms of nurses
b. Music therapy reduces the anxiety among post-operative CABG patients
c. Balanced diet and regular exercise decrease the incidence of postpartum depression
d. Female nurses have higher job satisfaction compare to male nurses

95. Pair of hypotheses that are similar to each other is:

- a. Simple and complex
b. Associative and causal
c. Directional and non-directional
d. Research and null

96. 'Demonstration method of teaching is more effective than video assisted teaching to teach nursing procedures' is an example of:

- a. Directional hypothesis
b. Complex hypothesis
c. Non-directional hypothesis
d. Null hypothesis

97. 'There is no difference in the anxiety level of children of high IQ and those of low IQ' is an example of a:

- a. Directional hypothesis
b. Non-directional hypothesis
c. Null hypothesis
d. Simple hypothesis

98. Which of the followings statement best describes the term 'research hypotheses'?

- a. It is formulated prior to a review of the literature
b. It is a statement of predicted relationships between two or more variables
c. It is a statement of known fact
d. All of the above

99. Hypotheses are often generated as the data are collected, interpreted, and analyzed in which type of research studies?

- a. Quantitative research studies
b. Qualitative research studies
c. Prospective cohort studies
d. Comparative studies



100. The statement of beliefs and ideas which are considered to be true are known as: (RAK MSc 2018)

- a. Hypothesis b. Assumption
c. Conceptual definition d. Operational definition

101. Realistic expectation which is something that we believe to be true is: (AIIMS Raipur NO 2019)

- a. Hypothesis
b. Conceptual framework
c. Assumption
d. Concepts

Explanation: Assumption is a statement on principles that are taken as truth based on a person's values and beliefs. In simple terms, it is a statement that is taken for granted or are considered to be true, even though they have not been actually scientifically tested or validated.

Hypothesis: It is a formal tentative statement of the expected relationship between two or more variables.

102. Basic principles that are accepted as being true on the basis of logic or reason, without proof or verification is referred as:

- a. Hypothesis b. Assumptions
c. Constructs d. Propositions

103. Which of the following term describes the boundaries that the researcher has set for the study?

- a. Assumption
b. Hypothesis
c. Conceptual framework
d. Delimitation

104. Those restrictions that the researcher places on the study before gathering data are called:

- a. Assumptions
b. Limitations
c. Delimitations
d. Hypothesis

105. Which of the following is true about delimitations?

- a. These are the shortcomings of a study.
b. These are the boundaries we set to our study before its start
c. These are the potential weaknesses in the study.
d. These include the drop out of the subjects.

RESEARCH APPROACH & DESIGNS

106. All the following are qualitative research methods; EXCEPT: (AIIMS BBS NO 2018)

- a. Phenomenology b. Ethnography
c. Grounded theory d. Correlation

Explanation: Qualitative research designs include historical research, phenomenology, ethnography, grounded theory, case study, and triangulation method.

Correlation research is a quantitative, non-experimental research, which involves the study of two variables and their correlation with each other in natural settings.

107. Examining cause and effect relationship between variables under highly controlled conditions is: (AIIMS BBS NO 2018)

- a. Correlational research
b. Experimental research
c. Descriptive research
d. Quasi-experimental research

Explanation: Cause and effect refer to a relationship between two variables in which one variable causes change in the other variable. Example. Regular exercise (cause) leads to weight loss (effect).

Experimental research methods are useful in establishing cause and effect relationship. True experimental research is the most accurate form of experimental research design to establish cause and effect.

Quasi-experimental does not have controlled conditions. Correlational and descriptive researches are non-experimental researches.

108. A blueprint for the conduction of study is:

(Daman & Diu NO 2018)

- a. Pilot study b. Research hypothesis
c. Research design d. Data collection tool

Explanation: A research design is a framework or blueprint for conducting the research. It specifies the details of the procedures necessary for obtaining the information.

109. Which of these designs is used to estimate the prevalence of osteoporosis? (Daman & Diu NO 2018)

- a. Cross-sectional
b. Quasi experimental
c. Cross-over
d. Factorial

Explanation: Quasi experimental, cross-over and factorial designs are methods of experimental research in which the researcher is interested to test the effectiveness of an intervention. Whereas cross-sectional studies collect data from subjects at only one point in time. It is usually carried out to assess the prevalence of specific disease or awareness on specific variable under study.

110. A careful appraisal of the strengths and weaknesses of the study is: (RAK MSc 2018)

- a. Research proposal
b. Action research
c. Research critique
d. Evidence-based practice

Explanation: Research critique is a systematic way of objectively reviewing a research study to highlight both its strengths and weaknesses.

A research proposal is a document proposing a research project. Action research is a type of research method and evidence-based practice refers to the use of current research evidences in nursing/medical practice.

111. The final step of the research process for a researcher is to: (Safdarjung NO 2018):

- a. Utilize the findings
b. Analyze the data
c. Interpret the findings
d. Communicate the findings

Explanation: As per the phases and steps of research process, the options given above can be sequentially organized as – analyze the data, interpret the findings, communicate the findings and then utilize the findings.

Utilization of the research findings is the final step a researcher can do.



Ans.

100. b
101. c
102. b
103. d
104. c
105. b
106. d
107. b
108. c
109. a
110. c
111. a



112. Which of the following is NOT TRUE about the characteristics of a good research? (Safdarjung NO 2018)

- a. Conducted using large amount of funds
- b. Orderly and systematic process
- c. Finding solution of problem
- d. Begin with clearly defined purposes

Explanation: Parsimony is one of the characteristics of scientific research. Research must be conducted in simple and economic manner. Using large amount of funds to conduct research is not cost effective and feasible.

113. Quantitative and qualitative research approaches are particularly useful in nursing because they:

- a. Require less resources
- b. Are easy to implement
- c. Generates different types of nursing knowledge
- d. Are both process oriented

114. A researcher conducts a smaller study of the planned study to identify any problematic areas before implementing a planned large scale research investigation. This smaller study is known as:

- a. Abstract study
- b. Exploratory study
- c. Pilot study
- d. Pretest

115. A research study framework reflects the:

- a. Researcher's "theory" or idea about the study
- b. Study design
- c. Methodology
- d. Data collection plan

116. As a professional, a nurse can do research for varied reason; except:

- a. Professional advancement
- b. To validate the results of new nursing modalities.
- c. For financial gains
- d. To improve nursing care

117. Which of the following is not the element of a research statement?

- a. Research design
- b. Research instrument
- c. Population
- d. Setting

118. The central concepts of conceptual models in nursing includes:

- a. Head, heart and hand
- b. Human, health, disease and environment
- c. Man, health, environment and nursing
- d. Agent, host, reservoir and environment

119. Which of the following is characteristic of qualitative research?

- a. Generalization to the population
- b. Random sampling
- c. Unique case orientation
- d. Application of statistics for analysis

120. Research in which the investigator plays an active, interactive role is called:

- a. Action research
- b. Interventional research
- c. Inferential research
- d. Interactive research

121. Which of the following would be in the introduction section of a research proposal?

- a. Data analysis procedure
- b. Description of an instrument
- c. A time frame
- d. Statement of purpose

122. Which of the following would not be in a research proposal?

- a. Budget
- b. Time frame
- c. Methods
- d. Results

123. A research proposal is best described as a:

- a. Framework for data analysis
- b. Written account of the plan for the intended study
- c. Description of ethical perspective of the study
- d. Argument for the merit of the study

124. Which of the following is the purpose of a research proposal?

- a. Guide for conducting study
- b. Saves money of the funding agency
- c. Prevents evaluation by others in doing study
- d. Helps in solving problems after conclusion of data analysis

125. A good research proposal will always:

- a. Focus on addressing the research objectives
- b. Focus on specific style of writing references
- c. Consider all possible research that had previously been done on the topic
- d. Provide researchers names and address

126. Which of the following type of studies is an example of qualitative research method?

- a. Cross sectional design
- b. Correlational studies
- c. Ethnography
- d. Survey design

127. Which of the following types of research study involve at least some control by the researcher to evaluate the intervention?

- a. Correlational
- b. Descriptive
- c. Cohort study
- d. Quasi-experimental

128. Which of the following type of research involves high researcher control, random sampling, and laboratory setting?

- a. Cohort study
- b. Case control study
- c. True Experimental
- d. Quasi experimental

129. Research questions: "Does motivational counseling before discharge by nurses improve patients' compliance with their drug regimens?"

Which of the following research is appropriate to answer this research question?

- a. Applied research
- b. Basic research
- c. Descriptive research
- d. Phenomenological research

130. A researcher investigates the effect of foot massage on sleep quality of patients. This study would be described as:

- a. Applied research
- b. Basic research
- c. Grounded theory approach
- d. Phenomenological research

131. Applied research seeks to solve a clinical problem in:

- a. Natural setting
- b. Laboratory setting
- c. Controlled setting
- d. Simulated setting

132. Which of the following is the best way to achieve scientific rigor in quantitative research?

- a. Following a strict time frame
- b. Extent of precision and control exerted by the methodology
- c. Degree of determination in data collection
- d. Analytical methods used to interpret and conclude the study



Ans.

- 112. a
- 113. c
- 114. a
- 115. a
- 116. c
- 117. b
- 118. c
- 119. c
- 120. b
- 121. d
- 122. d
- 123. b
- 124. a
- 125. a
- 126. c
- 127. d
- 128. c
- 129. a
- 130. a
- 131. a
- 132. b

**133. Quantitative research is a process to:**

- Describe lived experiences of people
- Develop theories and hypothesis
- Evaluate theories and hypothesis
- Obtain feelings and beliefs of the people

134. All of the following are the purpose of evidence-based practice; EXCEPT:

- To abolish wrong practices
- To improve quality of patient care
- To obtain more research funds from agencies
- To improve the patient-care outcome

135. Barriers of evidence-based practice includes all of the following; EXCEPT:

- Lack of knowledge
- Lack of scientific literature
- Lack of skills in conducting computer based literature search
- Lack of time to read literature

Explanation: The most important individual barriers to implementation of EBP are lack of time to read literature (due to higher work load), lack of ability to work with computer, lack of knowledge or language proficiency are the common barriers of evidence based practice.

There is no dearth of scientific literature in nursing science with online and printed sources. So, it is not a barrier in EBP.

136. All of the following are steps of quantitative research; EXCEPT:

- Formulation of research problem
- Formulation of research questions
- Data analysis
- Systemic review of research study

137. Find the odd one out regarding the typical characteristics of a research objective:

- | | |
|---------------|---------------|
| a. Observable | b. Measurable |
| c. Achievable | d. Verifiable |

138. What the acronym SMART specifies, that the objectives should be?

- Specific, measurable, achievable, realistic, and timely
- Simple, modifiable, applicable, realistic, technical
- Small, measurable, applicable, reliable, timely
- Sensitive, matching, affordable, robust, testable

139. All the following statements are correct regarding objectives; EXCEPT:

- An objective is a statement in specific and measurable terms
- Objectives have a broader perspective than aims.
- Objectives lay out how the researcher plans to accomplish the aims
- A research study may include a number of objectives

140. The statement “to compare the knowledge of primigravida and multigravida women regarding breast feeding practices” is described as research:

- | | |
|---------------|---------------|
| a. Assumption | b. Hypothesis |
| c. Objective | d. Problem |

141. Which of the following section of research report describes the study subjects in detail?

- Introduction
- Background
- Methodology
- Data analysis and Discussion

142. In a peer-reviewed journal, the articles are published on the basis of:

- Subjective discretion of the editors
- Number of authors listed
- Sincerity of the authors listed
- Comments of the reviewers

143. The sources to develop a conceptual framework includes all of the following; EXCEPT:

- Researcher's own experiences
- Historical evidences
- Previous research evidences
- Theoretical concepts

144. Phenomenological study involves all the following features; EXCEPT:

- | | |
|----------------|-----------------|
| a. Bracket out | b. Manipulation |
| c. Description | d. Analysis |

145. The method that focuses on description and interpretation of cultural behavior is referred as:

- Phenomenology
- Ethnography
- Grounded theory
- Symbolic interactionism

146. The research design in which the area of inquiry is the manner by which people make sense of social interactions:

- Symbolic interactionism
- Phenomenology
- Grounded theory
- Case study

147. The area of inquiry in grounded theory approach is:

- Lived experiences
- Social structural processes within social setting
- Holistic view of culture
- All of the above

148. Use of multiple referents to draw conclusions about what constitutes the truth is termed as:

(INC consortium PhD Entrance 2011)

- | | |
|----------------------|--------------------|
| a. Data verification | b. Cross reference |
| c. Error measurement | d. Triangulation |

149. Who coined the term ‘triangulation’ in research?

- | | |
|------------|-----------|
| a. Hungler | b. Stuart |
| c. Denzin | d. Polit |

150. The primary objective of an experimental research is to detect the effect produced by:

- | | |
|-------------------------|-------------------------|
| a. Extraneous variable | b. Confounding variable |
| c. Independent variable | d. Dependent variable |

151. Which of the following research design mandatorily requires randomization, control and manipulation?

- Explorative study
- Quasi-experimental design
- True experimental design
- Pre-experimental design

152. Properties of true experimental research study are the following; EXCEPT:

- | | |
|-----------------|------------------|
| a. Manipulation | b. Control |
| c. Matching | d. Randomization |

153. The type of research that has a control over variables, manipulates variables and uses purposive sampling, is known as:

- | | |
|-----------------------|----------------------|
| a. Non-experimental | b. Pre-experimental |
| c. Quasi experimental | d. True experimental |

Ans.

133. c
134. c
135. b
136. d
137. d
138. a
139. b
140. c
141. c
142. d
143. b
144. b
145. b
146. a
147. b
148. d
149. c
150. c
151. c
152. c
153. c

“Better ten times ill than one time dead.”
—Yiddish



CHAPTER 10

NURSING ADMINISTRATION AND MANAGEMENT

SYNOPSIS

ORGANIZATION

A systematic arrangement of people brought together to accomplish some specific purpose/goal.

ADMINISTRATION

It is the organization and direction of human and material resources to achieve desired goals. (Piffner & Presthus)

MANAGEMENT

Process of getting things done efficiently and effectively through and with other people.

Levels of Management

- Top Managers
- Middle Managers
- First-Line Managers

Theories of Management

1. Classical Management Perspective
2. Behavioral Management Perspective
3. Quantitative Management Perspective

1. Classical Management Perspective

It includes both scientific management and administrative management.

- Concerned with improving the performance of individual workers (i.e., efficiency).
- A theory that focuses on managing the organization as a whole.

Scientific Management

Frederick Taylor

- Father of scientific management
- Replaced the old rule-of-thumb method.
- Believed in selecting, training, teaching and developing workers.

- Used time study, standards planning, exception rule of management, slide-rules, instruction cards, incentives, etc.

Frank and Lillian Gilbreth

- Reduced number of movements in bricklaying, resulting in increased output of 200%.

Henry Gantt

- Developed other techniques, including the Gantt chart, to improve working efficiency through planning/scheduling.

Administrative Management Theory

- Focuses on managing the organization.

Henri Fayol

- Wrote General and Industrial Management
- Helped to systematize the practice of management
- First to describe management as planning, organizing, leading and controlling.

Fayol's 14 Principles of Management

- Division of labor
- Authority
- Discipline
- Unity of command
- Unity of direction
- Subordination of individuals to the common good
- Remuneration
- Centralization
- Scalar chain
- Order
- Equity
- Stability
- Initiative
- *Esprit de corps*

2. Behavioral Management Perspective

- Emphasizes individual attitudes and behaviors and group processes.



Key Points

- The administration is defined as an act of administering the whole organization by a group of people. (Top Level)
- Management is a systematic way of managing people and things **within the organization**. (Middle and lower level)



Practice Question

1. Which of the following is NOT one of the Fayol's principles of Management?

- a. Centralization
- b. Formal rules
- c. Division of labor
- d. Discipline

Ans. (b) Formal rules



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3. Quantitative Management Perspective

- This theory is concerned with applying quantitative management tools focusing on decision making, economic effectiveness, mathematical models and the use of computer.
- Management science, operations management, and management informational system are its branches.

LEADERSHIP

Theories on Leadership

- **Trait theories:** Individual with certain trait or characteristic become leader.
- **Leadership style theories:** Leadership style form most significant basis for effective leadership.
- **Trait and situational match theory:** When certain trait match with particular situation leadership become most effective.
- **Leadership style and situational theory:** When certain leadership style match with particular situation leadership become effective.
- **Greatman theory:** According to this certain people are born with certain characteristics to become a leader.
- **Charismatic theory:** People become leaders because they have charisma, because of this other people feels better in their presence and they will get emotional support and inspiration from leaders.
- **Situational theory:** Different situation require different trait to become leaders. So, a person who is leader at one situation may become follower at another situation.
- **Contingency theory:** According to this leader's role depends upon three situation and are—(1) leader-member relation, (2) task structure and (3) position power.
 - Leader-member relation means the faith and loyalty group members possessed towards the leader.
 - Task structure is said to be high if it is easy to define and measure a task in terms of goal clarity, extent to which the decision can be verified, multiplicity of goal path and specificity of solution. If not, then task structure is low.
 - Position power: It means the power which they are obtaining by sitting in a specified position or a chair.
- **Path goal theory:** As per this, leader facilitates the followers to accomplish goal by minimizing the obstruction and rewarding them for the accomplishment of the task.

Leadership Styles

- **Autocratic leadership:** Leader has strong control over the group and takes decision.

- **Democratic leadership:** Leader acts as a facilitator and encourages the group to take decision
- **Laissez fare leadership:** Leader participates minimally and acts as a resource person or consultant.
- **Participative leadership:** In this style functions are distributed among all the group members.

Leadership Style in Nursing

- Charismatic leadership
- Authoritarian leadership
- Democratic or participative leadership
- Laissez fare leadership
- Situational leadership
- Transactional leadership

BUDGETING

- Budget is the forecast of the resources required to deliver the services offered by the organization.
- A budget is a financial plan that includes estimated expenses as well as income for a period of time.
- Principles of budgeting:
 - Sound financial management
 - Based on objectives and polices
 - Financial and non-financial resources
 - Planned in advance
 - Consistent delegation
 - Coordination efforts
 - Adequate checks and balances
 - Appropriate to the nature of business
 - Under directions and supervision
 - Quality and quantity evaluation.
- Types of budget:
 - **Incremental budget:** A budget which is prepared using a previous period's budget or actual performance as a basis with incremental amounts added for the new budget period.
 - **Programme budget:** This type of budget includes expenses and revenues related to one specific project.
 - **Open-ended budget:** This is when a firm has pending transactions that will occur near the end of the accounting period, and the budget will not change until these are accounted for.
 - **Production budget:** The production budget calculates the number of units of products that must be manufactured.
 - **Cash budget:** A cash budget is an estimation of the cash flows of a business over a specific period of time.
 - **Flexible budget:** A flexible budget is a budget that adjusts or flexes with changes in volume or activity.
 - **Zero-based budget:** Zero-based budgeting (ZBB) is a method of budgeting in which all



Recent Question (INC PhD 2020)

2. Power due to position is

- Expert
- Legitimate
- Coercive
- Reward

Ans. (b) Legitimate



Key Points

- The leadership style in which the leader alone determines policies and makes plans is **Autocratic**.
- Whole team is involved in formulating decision in **democratic leadership**.
- **Laissez-faire leadership** (delegative leadership): Leader is hands-off and allows group members to make the decisions. The leader has absolutely no control.





expenses must be justified for each new period. This approach requires organizations to build their annual budget from zero each year to help verify that all components of the annual budget are cost-effective, relevant, and drive improved savings.

- **Rollover budget:** A *rollover budget* is when the budget category totals rollover into the following budget cycle.
- **Fixed ceiling budget:** A fixed budget is a financial plan that is not modified for variations in actual activity.
- **Capital expenditure budget:** A capital expenditure budget is a formal plan that states the amounts and timing of fixed asset purchases by an organization.

MATERIAL MANAGEMENT

It is a scientific technique, concerned with Planning, Organizing and Control of flow of materials, from their initial purchase to destination.

Aims of Material Management

To Get

- The right quality
- Right quantity of supplies
- At the Right time
- At the Right place
- For the Right cost

Purpose of Material Management

- To gain economy in purchasing
- To satisfy the demand during period of replenishment
- To carry reserve stock to avoid stock out
- To stabilize fluctuations in consumption
- To provide reasonable level of client services.

Objectives of Material Management

Primary

- Right price
- High turnover
- Low procurement
- Storage cost
- Continuity of supply
- Consistency in quality
- Good supplier relations
- Development of personnel
- Good information system

Secondary

- Interdepartmental

- Forecasting
- Product improvement
- Standardization
- Make or buy decision
- New materials and product
- Favorable reciprocal relationship

Basic Needs of Material Management

- To have adequate stock of material when required.
- To spend minimum money for high quality material.
- To reduce the inventory investment and to operate it efficiently.

Functional Areas of Material Management

- Purchasing
- Central service supply
- Central stores
- The print shops
- The pharmacy
- Dietary and linen services

INVENTORY CONTROL

It means stocking adequate number and kind of stores so that the materials can be available whenever and wherever required. Scientific inventory control results in optimal balance.

Functions of Inventory Control

- To provide maximum supply service, consistent with maximum efficiency and optimum investment.
- To provide cushion between forecasted and actual demand for a material

Always Better Control (ABC) Analysis

Items are divided into three categories named A, B and C.

A items are high value items, B items are intermediate value and C items are low value items.

- **Item A:** These are important items and it is about 10–20% of inventory items and consume 50–60% of the inventory cost. These items are having tight control and is managed by top level manager.
- **Item B:** These are 30–40% of all inventory items and consume 30–40% of the total inventory cost. These are important items but not critical. **These items are having moderate control and is managed by middle level manager.**
- **Item C:** Item C account for 40–50% of all inventory items and needs 5–10% of the total inventory cost. These items are having low level control and is managed by low level manager.



Recent Question (INC PhD 2020)

- 3. Budget which shows income and expenditure is known as**
- a. Capital budget
 - b. Revenue budget
 - c. Operational budget
 - d. Fixed budget

Ans. (b) Revenue budget



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VED Analysis

V	=	Vital
E	=	Essential
D	=	Desirable

- Vitals means shortage of the item cannot be tolerated.
- Essential items are those items, shortage of which can be tolerated for a short period.
- Desirable items are those items, shortage of which will not adversely leave any impact.

FSN Analysis

Based on Utilization

- Fast moving
- Slow moving
- Nonmoving

Nonmoving items must be periodically reviewed to prevent expiry and obsolescence.

HML Analysis

Based on Cost Per Unit

- Highest
- Medium
- Low

This is used to keep control over consumption at departmental level for deciding the frequency of physical verification.

STAFF DEVELOPMENT

Activities involved in staff development are as follows:

- Induction training
- Job orientation
- In-service education
- Continuing education

Induction Training

During the first 2–3 days of duty the employee is given with brief explanation of policies, regulations, philosophy and standard.

Job Orientation

New employee is given with orientation regarding job responsibilities, work place, client and coworker.

In-service Education

Ongoing job instructions are given to employees to enhance their work performance.

Continuing Education

It's a planned activity directed towards meeting learning needs of a the nurse following basic nursing education exclusive of full time formal post-basic education.

QUALITY MANAGEMENT

Quality is defined as proper performance (according to standards) of interventions that are known to be safe, that are affordable to the society in question, and that have the ability to produce an impact on mortality, morbidity, disability and malnutrition.

- **Quality management** can be considered to have four main components: quality planning, quality control quality assurance and quality improvement.
- **Quality management** uses quality assurance and control of processes as well as products to achieve more consistent quality.

Principles of Quality Management

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach to decision making
- Mutually beneficial supplier relationships

Approaches for a Quality Assurance Programme

- Credentialing
- Licensure
- Accreditation
- Certification

Credentialing

Credentialing refers to a type of designation, award, status, recognition, or *seal of approval* to the individuals or organizations.

It is the formal reorganization and establishing qualification of licensed individual.

Licensure

It is granting permission to the individual for the entry and exit from a particular profession. Licensure helps to ensure the quality professional practice.

Accreditation

Accreditation is a process in which certification of competency, authority, or credibility is awarded to an agency or organization.

Assessment is done by an independent agency. Agency's physical structure, organizational structure and personnel qualifications are assessed. The aim of accreditation is to encourage organizational development.

Example: NABH and NAAC accreditation for Hospitals and Universities/Educational institutes respectively.



Key Points

- **Cost-benefit analysis** is the most popular economic evaluation tool used for program priority setting.
- The cost covering the salaries of the staff and machinery/equipment is termed Fixed cost.
- Inventory control is the process of maintaining the optimum needed quantity that is sufficient for the smooth operation of the organization.
- **Procurement:** Process of selecting vendors, establishing payment terms, selection, negotiation, and purchasing of goods.
- The time that elapses between placement of an order and delivery of the material is termed **Lead Time**.
- VED stands for Vital, Essential and Desirable.
- **FSN** stands for fast-moving, slow-moving and non-moving items.
- In FSN analysis, items are classified on the basis of rate of consumption.
- Delegation refers to assignment of any responsibility or authority to another person to carry out specific activities.
- The purpose to conduct staff training is to improve communications, staff morale, and quality of work.




Ans.

44. b
45. c
46. c
47. b
48. b
49. a
50. a
51. b
52. b
53. b
54. a
55. b
56. b
57. b
58. b
59. b
60. a

44. Which of the following model is based around the concept of providing economic security for employees through wages and other benefits that will create employee loyalty and motivation?

- a. Autocratic Model b. Custodial Model
c. Supportive Mode d. Collegial Model

45. In which model, employees depend on each other cooperatively and work as a team with enthusiasm and self-discipline to do the task?

- a. Humanistic Model
b. Modern Organizational Model
c. Collegial Model
d. Behavioral or Neoclassical Model

46. Below are the Fayol's 14 Principles of Management; EXCEPT:

- a. Authority b. Discipline
c. Unity of work d. Unity of direction

47. Herzberg classified the needs into two broad categories namely:

- a. Hygiene factors and improving factors
b. Hygiene factors and motivating factors
c. Hygiene factors and successful factors
d. Hygiene factors and leadership factors.

48. Which of the following theorist said "workers are inherently motivated and eager to accept responsibility. An appropriate management style is to focus on creating a productive work environment coupled with positive rewards and reinforcement"?

- a. Hertz Berg b. McGregor's
c. Path Goal d. Behavior

49. Which of the following theory suggests that behavior is guided by biological needs and learned ways of reducing drives arising from those needs?

- a. Drive Reduction Theory b. Incentive Theory
c. Theory X d. Theory Y

THEORIES AND STYLES OF LEADERSHIP

50. A public health nurse in the health center behaves like a dictator and uses position power to get her work done. She makes all the decisions and does not involve her subordinates in decision making. Which style of leadership BEST describes her? (RAK MSC 2018)

- a. Autocratic b. Democratic
c. Bureaucratic d. Laissez faire

Explanation: In autocratic leadership style, the leader assumes complete control over the decisions and activities of the group.

51. The leadership style in which the leader alone determines policies and make plans is: (AIIMS Raipur NO 2019)

- a. Democratic b. Autocratic
c. Rewarded d. Laissez-faire

Explanation: Leadership styles:

- **Autocratic:** Leader alone establishes policies and makes plans. The criteria used by him is "Do what I say or else..."
- **Democratic:** Whole team is involved in formulating decision.
- **Laissez-faire** (Delegative leadership) Leaders allow group members to make the decisions. The leader has absolutely no control.
- **Rewarded** is not a type of leadership style.

52. Leadership is important for the success of any organization. The following are important elements in leadership; EXCEPT: (RAK MSC 2018)

- a. There must be a leader and followers in the organization
b. The leader is usually autocratic
c. There is unequal distribution of power between the leader and the followers
d. Leaders can influence the followers by their behavior.

Explanation: Leadership is an ability to influence an individual or group in order to maintain the morale of the group. Leader has followers. Leaders counsel the employees and develop team spirit. Here they have considerable freedom of action, which is usually not there in autocratic type of leadership.

53. Acknowledging the performance of an employee is through the way of: (AIIMS Raipur NO 2019)

- a. Self-assessment b. Performance appraisal
c. Rewards d. Appreciation

Explanation: Acknowledging the performance of an employee is through the way of **Performance appraisal**. Performance appraisal is a periodic formal evaluation of how well personnel have performed their duties during a specific period. The outcome of performance appraisal is used to determine the reward, promotion, etc.

54. The style of leadership that dominates and commands the group is: (DSSSB PHN, 2015)

- a. Autocratic b. Democratic
c. Situational d. Laissez-faire

55. Which type of leadership theories considers that the people inherit certain qualities that make them better suited to leadership?

- a. Learning theories b. Trait theories
c. Behavioral theories d. "Great Man" theory

56. The tendency to over-rate an employee's performance is known as:

- a. Positive effect b. Halo Effect
c. Hawthorn Effect d. Biasness

57. Which of the following is the best leadership style in a crisis situation where a quick decision making and implementation is required?

- a. Democratic b. Authoritarian
c. Bureaucratic d. Laissez-faire

58. Which of the following characteristics is NOT a characteristic feature of Laissez-faire leadership?

- a. Very little guidance from leaders
b. There is little time for group decision-making
c. Complete freedom for followers
d. Leaders provide the resources needed

59. Moderate control, motivation, awards, interactive communication, and group decision making are the characteristic features of:

- a. Authoritarian leader b. Democratic leader
c. Laissez - faire leader d. Autocratic leader

60. A method of negotiation in which employees use authorized union representatives to engage in talks with authority is known as:

- a. Collective bargaining
b. Leadership
c. Group dynamics
d. Advocacy



Ans.

61. a
62. b
63. c
64. b
65. b
66. a
67. b
68. b
69. c
70. a
71. a
72. d
73. b
74. a
75. c
76. a
77. d
78. c
79. c
80. c
81. b
82. a
83. b

61. **Authority means:**
a. Right to command
b. Right to reprimand
c. Right to use and abuse power
d. Right to perform duty
62. **Which of the following power refers to the ability of a leader to influence a follower because of the follower's loyalty and admiration?**
a. Coercive power
b. Referent power
c. Legitimate power
d. Authoritative power
63. **The nurse in-charge of the ward says my staff has done the right thing in the right time. What type of statement is this?**
a. Aggressive
b. Harsh
c. Assertive
d. Passive
64. **Which of the following is the ideal way for a standard organization to retain the motivation of its competent employees?**
a. Competent pay scale
b. Transparent policies
c. Free education for children
d. Free health care facilities
65. **Assignment of any responsibility or authority to another person to carry out specific activities is known as:**
a. Promotion
b. Delegation
c. Deputation
d. All of these
66. **Leadership style in which all the rights to make decisions is fully given to the worker is known as:**
a. Laissez – fair
b. Autocratic
c. Democratic
d. Authoritarian
67. **Which of the following is NOT a characteristics of a leader:**
a. Has position authority not formal authority
b. Administers rather than innovates
c. Influences followers instead of giving instructions
d. Has followers but no subordinates
68. **Which of the following is NOT a characteristic of an authoritarian leader?**
a. Do not consult subordinates to make decision
b. Listen to the employees of the organization
c. One-way communication is preferred
d. Instruct his employees exactly what he wants
69. **Which of the following is not a role of supervisors?**
a. Informing employees regarding organizational policies
b. Train the employees
c. Authoritative
d. Mentor to juniors
70. **Which of the following attributes is least likely to be cause of conflict in administration?**
a. Authority
b. Needs
c. Perception
d. Power
71. **The team member who gets the team members moving in the right direction is known as:**
a. Coordinator
b. Controller
c. Recorder
d. Mobiliser
72. **A team member who always prefers everyone in the group to follow what he propose is a:**
a. Active member
b. Criticizer
c. Pleaser
d. Controller
73. **Once a problem is formulated, the next step is to:**
a. List all possible solutions
b. Decide what is critical in the decision
c. Select an alternative choice
d. Compare all possible solutions

74. **Managers have the ability, authority and power to control their employees. However, the employee's performance in this model will be much lower than expected. This is the feature of which of the following model?**
a. Autocratic Model
b. Custodial Model
c. Collegial Model
d. Supportive Model
75. **All the following are said to be the quality of a leader; EXCEPT:**
a. Inspire
b. Develop
c. Administer
d. Innovates
76. **Theory focuses on individual characteristics of successful leader:**
a. Trait Theory
b. Managerial Grid
c. Contingency Theory
d. Behavior Theory

MATERIAL MANAGEMENT & INVENTORY CONTROL

77. **Stocking adequate numbers and kinds of stores, so that the required material is available whenever necessary is:**
(AIIMS Raipur NO 2019)
a. Replacement
b. Procurement
c. Storage
d. Inventory control

Explanation:

- **Inventory control** is the process of maintaining the optimum needed quantity (stocks) that is sufficient for the smooth operation of the organization.
- **Replacement:** System of replacing certain items.
- **Procurement:** Process of purchasing of goods.
- **Storage:** Storage of materials at an appropriate place.

78. **VED stands for:** (AIIMS Nagpur NO 2018)
a. Valuable, Essential, Desirable
b. Valuable, Estimated, Desirable
c. Vital, Essential, Desirable
d. Vital, Estimated, Desirable

Explanation: VED analysis is a technique in inventory control. It divides inventory into three groups: **vital items, essential items and desirable items.**

79. **Checking the equipment and supplies periodically is known as:**
a. Item analysis
b. Investigation
c. Inventory
d. Indent
80. **The process of linking each item of expenditure to its justified purpose is known as:**
a. Cost analysis
b. Cost Saving
c. Cost Accounting
d. Value Analysis
81. **In budgeting terms, the source of income is known as:**
a. Capitation
b. Revenue
c. Budget
d. Profit source
82. **Inventory refers to:**
a. Detailed list of all articles in the ward, their specifications and standard quantity
b. List of articles borrowed from a central supply
c. List of articles for repair or replacement
d. List of obsolete materials
83. **The institutional budget that forecasts revenues and expenses for a period beyond the current year is referred as:**
a. Forecast budget
b. Rollover budget
c. Flexible budget
d. Predictive budget

"If you would live long, open your heart."
—Bulgarian

CHAPTER 11

MICROBIOLOGY



SYNOPSIS

HISTORICAL PERSPECTIVES OF MICROBIOLOGY

- **Microbiology:** It is the study of microorganism which is only visible through microscope.
- Aristotle (384-322) and others believed that living organisms could develop from non-living materials.
- Rogen bacon in 13th century described that the disease caused by a minute "seed" or "germ".
- **Antony van Leeuwenhoek (1632–1723)**
 - Descriptions of protozoa, basic types of bacteria, yeasts, and algae.
 - The first to see and describe bacteria and their characteristic morphology.
 - Father of bacteriology and protozoology.
 - In 1676, he observed and described microorganisms such as bacteria and protozoa as "animalcules".
- **1798:** Edward Jenner introduces the concepts of vaccination using cowpox material to prevent small pox.
- **Louis Pasteur:**
 - He coined the term "microbiology", aerobic, anaerobic.
 - He disproved the theory of spontaneous germination.
 - He contributed to the development of the first vaccines for the immunization against rabies, anthrax, and chicken cholera.
 - He described the scientific basis for fermentation, winemaking, and the brewing of beer and pasteurization.
 - Pasteur postulated the **germ theory of disease**, which states that microorganisms are the causes of infectious disease.

- **Joseph Lister (1827–1912)**
 - He is the father of antiseptic surgery.
- **Robert Koch**
 - Discovered causative agent for anthrax, tuberculosis, and cholera.
 - His discoveries, in combination with those of Pasteur, established the germ theory of disease
- **Edward Jenner (1749–1823)**
 - First to prevent small pox.
 - He discovered the technique of vaccination.
- **Alexander Fleming**
 - Discovered penicillin in 1929, an antibiotic produced by a fungus that inhibits bacterial growth.
- **Paul Ehrlich:** In 1882 he reported the acid-fastness of tubercle bacillus.

THE NORMAL BACTERIAL FLORA OF HUMAN BODY

Resident Flora

These organisms are relatively fixed and regular type of organism found at a given body site. They perform functions such as synthesis of vitamin K, absorption of nutrient, breakdown of nutrients, etc.

Transient Flora

These are non-pathogenic and potentially pathogenic organisms. These microorganisms do not produce disease under normal circumstances. But if normal flora is destroyed and immune system is weak then they may produce disease.



Key Points

- **Louis Pasteur (1822-1895)** is considered as the father of microbiology.
- **Louis Pasteur introduced sterilization** technique and stem sterilizer, autoclave and hot air oven.
- **Louis Pasteur** introduced first live-attenuated vaccine.
- **Robert Koch** is known as the **father of bacteriology**.
- **Robert Koch** introduced **staining technique**.
- **Robert Koch** discovered anthrax bacillus, tubercle bacillus and the cholera vibrios.
- **Joseph Lister** introduced antiseptic surgery.
- **Karl Landsteiner** discovered **ABO blood groups**.
- **Alexander Fleming** discovered the drug **penicillin**.

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Types of Disinfectant/Antiseptic

Types	Examples
Alcohol	70% alcohol
Aldehydes	Formaldehyde (3–8%), gluteraldehyde (2%)
Biguanides	Chlorhexidine
Halogen releasing agent	Hypochlorites (1–2%), povidone-iodine
Phenols	Chloroxylenol, hexachlorophene
Heavy metal derivatives	Salt of heavy metal such as silver and mercury
Peroxygen	Hydrogen peroxide

- All the articles are to be cleaned with soap and water before disinfecting it.
- Sterilization:** It destroys or removes all microorganisms including spores.
- HIV, HBV and HCV are the three important blood-borne pathogens that affect the healthcare workers (HCWs).
- Immunity is a state of resistance to microorganism and their products.
- WBCs are responsible for immune response.
- Immunity against disease condition can be natural (innate) or acquired (adaptive).



Key Points

- A chemical agent that inhibits bacterial growth is called **bacteriostat**.
- A chemical agent that kills bacteria is called **bactericidal**.
- T cells are responsible for cell-mediated immunity.
- B lymphocytes are responsible for humoral immunity or antibody-mediated immunity.
- Pleomorphic Bacteria** have variable shape (bacteria with changeable shape).
- Spherical bacteria occurring in clusters are called *Staphylococcus*
- Vibrio cholerae** are comma-shaped bacilli.

CLASSIFICATION OF BACTERIA

Shapes and Arrangement of Bacteria

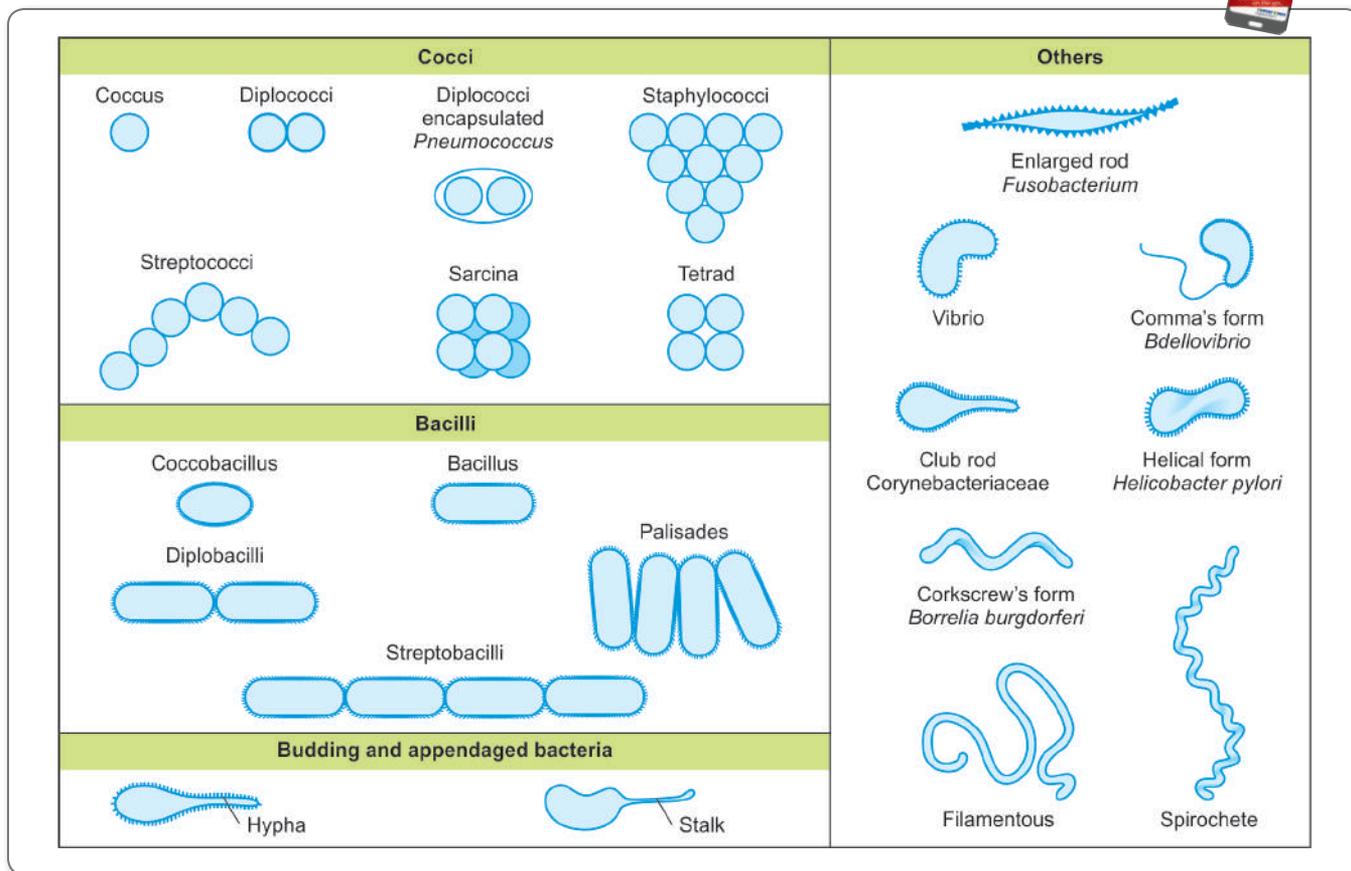


Figure 1 ■ Bacterial morphology





Gram-Positive and Gram-Negative Bacteria

Table 4: Gram-positive and Gram-negative bacteria

Gram-positive bacteria	Gram-negative bacteria
<ul style="list-style-type: none"> • <i>Staphylococcus</i> • <i>Streptococcus</i> • <i>Pneumococcus</i> • <i>Mycobacterium</i> • <i>Clostridium tetani</i> • <i>Bacillus anthracis</i> • <i>Lactobacillus</i> 	<ul style="list-style-type: none"> • <i>Neisseria gonorrhoeae</i> • <i>Neisseria meningitidis</i> • <i>Pseudomonas</i> • <i>Vibrio cholerae</i> • <i>Salmonella</i> • <i>Escherichia coli</i> • <i>Shigella</i> • <i>Brucella</i>



The Medically Important Cocci

Table 5: Diseases with their causative cocci

Cocci	Types	Diseases
<i>Staphylococcus</i>	Gram-positive	<i>Staphylococcus aureus</i> : breast abscess, wound infection, pneumonia, acute osteomyelitis, meningitis, endocarditis, renal abscess, food poisoning,
<i>Streptococcus</i>	Gram-positive	Sore throat, scarlet fever, pyoderma, acute rheumatic fever, glomerulonephritis, pharyngitis,
<i>Enterococcus</i>	Gram-positive	Bacteremia, surgical wound infection, urinary tract infection, endocarditis
<i>Pneumococcus</i>	Gram-positive	Acute bacterial meningitis, otitis media, conjunctivitis, sinusitis, empyema, peritonitis
<i>Meningococcus</i>	Gram-negative	Septicemia, meningitis,
<i>Gonococcus</i>	Gram-negative	Lower genital tract infection, urethritis, cervicitis, salpingitis, endometritis, epididymitis, pharyngitis



The Medically Important Bacilli

Table 6: Bacilli associated with respiratory tract infection

Microorganisms	Types
<i>Corynebacterium diphtheria</i>	Gram-positive
<i>Hemophilus influenzae</i>	Gram-negative
<i>Bordetella pertussis</i>	Gram-negative
Legionnaire's disease	Gram-negative
<i>Klebsiella species</i>	Gram-negative



Table 7: Bacilli associated with infections of intestinal wall

Microorganisms	Types
<i>E. coli</i>	Gram-negative
Typhoid, paratyphoid	Gram-negative
Dysentery bacilli (<i>Shigella spp</i>)	Gram-negative
<i>Proteus spp normal</i>	Gram-negative
<i>Pseudomonas normal</i>	Gram-negative



Key Points

- **Acetone** is the decolorizing agent used in Gram staining.
- ***E. coli*** is a Gram negative motile bacillus.
- ***E. coli*** is the most common cause of Urinary Tract Infection (UTI).
- ***Staphylococcus aureus*** is a Gram-positive cocci associated with infective endocarditis in IV drug users.
- ***Clostridium perfringens*** causes gas gangrene.
- ***Clostridium botulinum*** is spore forming, non-motile, encapsulated bacterium. It causes food poisoning.



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Spore-bearing Medically Important Bacilli

Table 8: Diseases and their causative spore-bearing bacilli

Microorganisms	Types	Diseases
<i>Clostridium tetani</i>	Gram-positive	Tetanus
<i>Clostridium perfringens</i>	Gram-positive	Gas gangrene
<i>Clostridium botulinum</i>	Gram-positive	Botulism (food poisoning)
<i>Clostridium difficile</i>	Gram-positive	Pseudomembranous colitis
<i>Bacillus anthracis</i>	Gram-positive	Anthrax

Bacilli Derived from Infected Animal

Table 9: Diseases and their causative bacilli

Microorganisms	Types	Diseases
<i>Plague bacillus</i>	Gram-negative	Plague
<i>Brucella spp</i>	Gram-negative	Brucellosis

The Causative Organisms

Table 10: Diseases and their causative organisms

Microorganism	Types	Disease
<i>Vibrio cholerae</i>	Gram-negative	Cholera
<i>Campylobacters</i>	Gram-negative rods	Diarrhea
<i>Helicobacter pylori</i>	Gram-negative	Gastric/Duodenal ulcer
<i>Bacteroides</i>	Gram-negative	Abdominal, brain and lung abscess

Diagnostic Tests Done

Table 11: Various diseases and their diagnostic tests

Diagnostic tests	Diseases
Paul-Bunnell test	Infectious Mononucleosis
Mantoux test	Tuberculosis (TB)
Schick test	Diphtheria
Widal test	Typhoid
VDRL test	Syphilis
Dick Test	Scarlet fever
Weil-felix reaction	Typhus fever

VIRUS

- It is the smallest known infective agents.
- Virus carry its own genetic information in the form of DNA or RNA.
- Genome is protected by an outer protein coat (capsid) composed of capsomers.
- The stages of viral replication are adsorption, entry into cells, uncoating, biosynthesis, virion assembly and release
- It has no metabolic activity outside the host cell.
- Viruses vary in shape from the simple helical and icosahedral to more complex structures.
- Antibiotics have no effect on viruses, but antiviral drugs have been developed to treat life-threatening infections.
- Vaccines that produce lifelong immunity can prevent some viral infections.



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Key Points

- *T. pallidum* is the causative agent of **syphilis**.
- **VDRL** (Venereal Disease Research Laboratory) test is done for the **diagnosis of syphilis**.
- **Poxviruses are the largest** and most complex of all viruses.
- **Hepatitis B** is caused by **DNA virus** and all other types of hepatitis are caused by RNA viruses.
- **Most common cause of diarrhea in children in the age group of 6–24 months: Rotavirus**
- Most common cause of Acute Hemorrhagic Conjunctivitis: Enterovirus (70%).
- The main cause of **genital warts** (Condylomata Acuminata) is human papilloma virus (HPV).
- HIV is called retrovirus.



Explanation:

- **Lophotrichous:** The flagella are present in the form of cluster at one pole.
- **Amphitrichous:** When a single or clusters of flagella are present at both ends.
- **Monotrichous:** When a single polar flagellum is present on a bacteria.
- **Peritrichous:** When flagella are lateral and surround whole surface of bacteria.
- **Atrichous:** No flagella

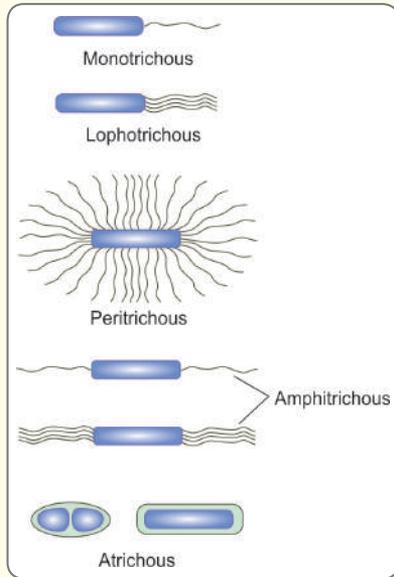


Figure ■ Types of flagellar arrangement in bacteria

16. Depending upon their oxygen requirement and metabolism Vibrio Cholerae species are: (Safdarjung NO 2018)

- Obligate aerobes
- Facultative anaerobes
- Obligate anaerobes
- Microaerophilic

Explanation: *Vibrio cholerae* are aerobes and facultative anaerobes. Facultative anaerobe is organism which forms ATP by aerobic respiration in presence of oxygen, but is capable of switching to fermentation or anaerobic respiration in absence of oxygen.

17. All of the following occur in the stationary phase of bacterial growth curve; EXCEPT: (Safdarjung NO 2018)

- Cells show uniform and regular staining
- Cells show presence of intracellular storage granules
- Spores are seen
- Exotoxins are formed

Explanation: In the stationary phase, the bacteria may turn Gram negative from Gram positive. All other statements regarding stationary phase of bacterial growth are true.

18. Which of the following is the unit of measurement in bacteriology? (AIIMS BPL NO 2018)

- Joule
- Newton
- Micron
- Pascal

Explanation: 1 micron = one thousandth of a millimeter. It is the unit used in bacteriology.

19. Nutritional dependent bacteria are called:

(AIIMS BPL NO 2018)

- Heterotrophs
- Autotrophs
- Chemotrophs
- Phototrophs

Explanation: Heterotrophs do not make their own food so depend on other sources of energy.

Autotrophs make their own food. Chemotrophs use chemicals to prepare their food. Phototrophs use photosynthetic pigments to prepare food.

20. A food item commonly associated with Bacillus cereus food poisoning is: (AIIMS-BBS SNO 2019, ESIC 2019)

- Honey
- Green beans
- Baked potato
- Fried rice

Explanation: *Bacillus cereus* is a toxin-producing bacteria that is one of the most common causes of food poisoning, also called "fried rice syndrome". The bacteria are contacted from fried rice dishes that have been kept at room temperature for hours.

21. The division of bacterial cells and the exponential increase in their number are indicative of which phase? (AIIMS BPL NO 2018)

- Lag phase
- Stationary phase
- Phase of decline
- Logarithmic phase

Explanation: Logarithmic phase, also known as exponential phase is a period described by cell doubling. The number of new bacteria appearing per unit time is proportional to the present population.

22. Example of acid fast bacilli? (RRB Feb 2012)

- E. coli*
- Mycobacterium*
- Clostridium*
- None of these

23. Mycobacterium leprae is also known as:

- Golden bacilli
- Koch's bacillus
- Magical bacilli
- Hansen's bacilli

24. Drug of choice to treat leprosy is:

- Rifampicin
- Acyclovir
- Zidovudine
- Dapsone

25. Mycobacterium tuberculosis is also known as:

- Golden bacilli
- Koch's bacillus
- Magical bacilli
- Hansen's bacilli

26. All of the following are acid-fast organisms; EXCEPT:

- Mycobacterium tuberculosis*
- Nocardia*
- Isospora belli*
- Staphylococcus*

27. Bacterial structure involved in respiration is:

- Ribosome
- Pili
- Mesosome
- Flagella

28. Identify correct statement regarding bacteria:

- Respiration, cell division and sporulation are the functions of mesosome in bacteria
- Capsule in bacteria enables adherence to surface and protection against phagocytosis
- Heterotrophs are the bacteria that are unable to synthesize their own food materials
- All of the above

29. Correct regarding cocci are:

- Cocci are spherical shaped bacteria
- Cocci present in chain is known as streptococci
- Cocci present in the shape of grapes is known as staphylococci
- All of the above

**Ans.**

- b
- a
- c
- a
- d
- d
- d
- d
- b
- d
- d
- c
- d
- d



- 30. Coma shaped bacteria are known as:**
 a. Staphylococci b. Streptococci
 c. Vibrio d. Bacillus
- 31. MRSA is mediated due to:**
 a. Plasmid b. Chromosome
 c. Transposons d. None of these
- 32. Which one of the following is post streptococcal sequelae:**
 a. Acute rheumatic fever b. Cellulitis
 c. Pharyngitis d. Impetigo
- 33. Acid fast staining is used to detect:**
 a. Mycobacterium TB b. C. tetani
 c. HIV/AIDS d. Meningococci
- 34. Gas gangrene is caused by:**
 a. Clostridium tetani
 b. Clostridium botulism
 c. Corynebacterium diphtheriae
 d. Clostridium perfringens
- 35. Food poison is caused by:**
 a. Clostridium perfringens
 b. Clostridium botulism
 c. Corynebacterium diphtheriae
 d. Clostridium tetani
- 36. Incubation period for primary syphilis:**
 a. 1–2 days b. 1–2 weeks
 c. 1 month d. 3 months
- 37. The causative agent of Tuberculosis (TB) is:**
 a. Mycobacterium tuberculosis (RPSC Nsg. Tutor 2009)
 b. Mycobacterium leprae
 c. Treponema pallidum
 d. Borrelia species
- 38. The causative agent of Syphilis is:**
 a. Mycobacterium tuberculosis
 b. Mycobacterium leprae
 c. Treponema pallidum
 d. Borrelia species.
- 39. Lyme disease is caused by:**
 a. Borrelia vincenti b. Borrelia burgdorferi
 c. Borrelia recurrentis d. Leptospira interrogans
- 40. Pathogenic organism in the blood is known as:**
 a. Toxemia b. Septicemia
 c. Bacteremia d. Hemangioma
- 41. The typical bacterial growth curve shows:**
 a. 5 phases b. 4 phases
 c. 3 phases d. 2 phases
- 42. Study of bacteria requires the use of:**
 a. Microscopes b. Telescopes
 c. Cystoscopes d. Endoscopes
- 43. The causative agent of plague is:**
 a. Mosquito b. Yersinia pestis
 c. Mycobacterium tuberculi d. Mycobacterium leprae
- 44. The microorganism that can be acid-fast stained is:**
 a. Tubercle bacilli b. Lepra bacilli
 c. Nocardia d. All of these
- 45. Characteristic feature of staphylococcus aureus is:**
 a. It is aerobic
 b. It produces golden yellow colonies.
 c. Non-sporing
 d. All of the above
- 46. Dental caries are caused by:**
 a. E. Coli b. Lactobacilli
 c. Shigella d. Staphylococci
- 47. The microorganism closely associated with dental caries is:** (AIIMS-BBS SNO 2019)
 a. Corynebacterium species
 b. Urea plasma species
 c. Candida albicans
 d. Streptococcus sanguis
- 48. Thermophilic bacteria grow at:** (ESI Jaipur Exam. 2009)
 a. 25°C b. 30°C
 c. 35°C d. 50°C
- 49. "Klebs Loeffler bacillus" is the name of:** (RPSC NG-II Exam. 2007)
 a. Streptococci
 b. Salmonella typhi
 c. Corynebacterium diphtheria
 d. Meningococci
- 50. Bacteria belongs to:**
 a. Prokaryotes b. Eukaryotes
 c. Both a and b d. None of these
- 51. Site of respiration in bacteria is:** (Q wave Vol 2)
 a. Mitochondria b. Golgi apparatus
 c. Cell membrane d. Cell wall
- 52. Bacteria that grow between 25°C and 40°C are:**
 a. Capnophilic b. Psychrophilic
 c. Thermophilic d. Mesophilic
- 53. Shape of cocci:**
 a. Rod b. Spherical
 c. Comma d. Spiral
- 54. Which of the following is a Gram-positive cocci?** (AIIMS 2015)
 a. Streptococcus b. Neisseria
 c. Escherichia d. Corynebacterium
- 55. Population doubling time in coliform bacilli is:** (PGI May 2015)
 a. 20 seconds b. 20 minutes
 c. 20 hours d. 20 days
- 56. The following organism is arranged in cubical pockets of eight cocci:**
 a. Micrococcus b. Sarcina
 c. Aerococcus d. Peptostreptococcus
- 57. Gram-positive bacteria is which is usually sensitive to penicillin is:**
 a. Staphylococcus aureus
 b. Enterococcus faecalis
 c. Streptococcus pyogenes
 d. Staphylococcus epidermidis
- 58. Streptococci causing neonatal meningitis:**
 a. Group-A b. Group-B
 c. Group-C d. Group-D
- 59. Which of the following gram positive bacteria is responsible for food poisoning?**
 a. Mycoplasmas b. Pseudomonas
 c. Clostridia d. All of these
- 60. Methicillin resistance bacteria are:**
 a. Streptococci b. Pseudomonas
 c. Hemophilus d. Staphylococci
- 61. The organism causing UTI in sexually active women:**
 a. Staphylococcus aureus
 b. Staphylococcus epidermidis
 c. Staphylococcus saprophyticus
 d. Streptococcus viridans



Ans.

30. c
 31. b
 32. a
 33. a
 34. d
 35. b
 36. c
 37. a
 38. c
 39. b
 40. b
 41. b
 42. a
 43. b
 44. d
 45. d
 46. b
 47. d
 48. d
 49. c
 50. a
 51. c
 52. d
 53. b
 54. a
 55. b
 56. b
 57. c
 58. b
 59. c
 60. d
 61. c

CHAPTER 12

BIOCHEMISTRY AND NUTRITION



SYNOPSIS

BIOCHEMISTRY

INTRODUCTION

- Biochemistry is the study of chemical processes within a body and related to the living organisms.
- The first enzyme discovered was 'diastase' (now called 'amylase') in the year 1833.
- James Watson, Francis Crick, Maurice Wilkins, and Rosalind Franklin (1950s) co-discovered the **helix structure of DNA**.

THE CELL

- The cell is the structural and functional unit of life.
- Living cells are divided into two groups:
 - Prokaryotes, e.g., Bacteria (unicellular)
 - Eukaryotic cells, e.g., Animal cells, plant cells, fungi and protozoa (unicellular or multicellular)



Key Point

- The name Biochemistry was coined in 1903 by a German chemist named Carl Alexander Neuber (1877-1956). He is regarded as "father of modern biochemistry".



Table 1: Differences between prokaryotic cells and eukaryotic cells

Parameters	Prokaryotic cells	Eukaryotic cells
Cell size	Small (1–10 nm)	Large (1 to 10000 times larger in size than prokaryotic cells)
Overall organization	Simple	Complex
Cell wall	Present	Absent
Cell membrane	Present sometimes surrounded by capsule	Present
Nucleus	Single nucleus which contains double helix DNA that is present in a poorly defined region called nucleoid	Well defined nucleus with a membrane and multiple DNA double helices organized into chromatin
Reproduction	Asexual	Sexual
Examples	Bacteria, blue green algae	Animal and plant cells

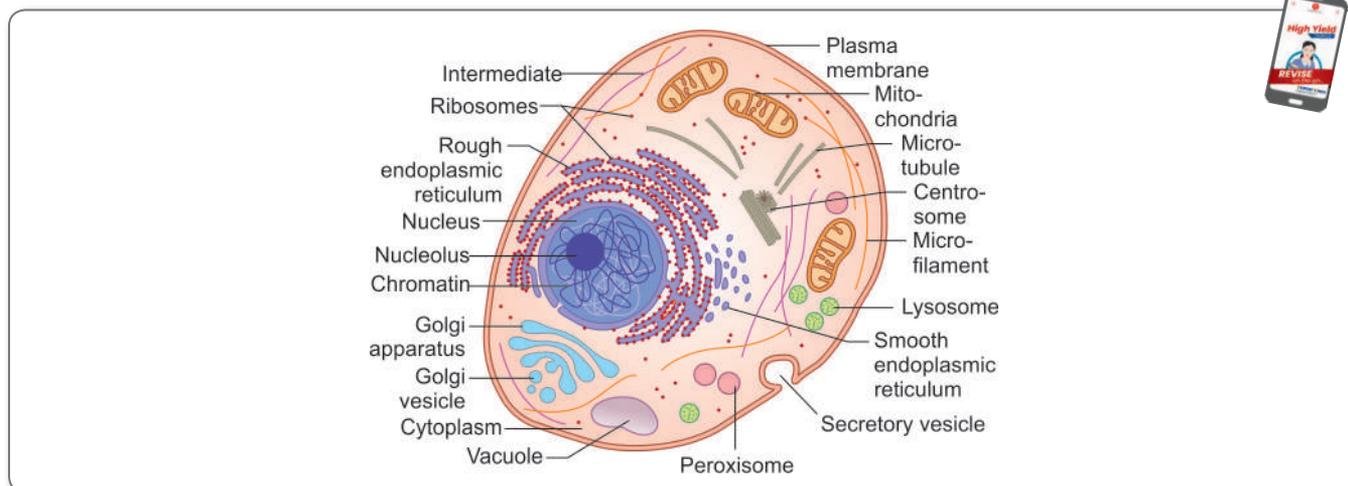


Figure 1 ■ Animal cell structure



Key Points

Cell Organelles

Nucleus

- **Nucleus** is the largest component of the cell, containing DNA organized into separate chromosomes.
- Nucleus is surrounded by nuclear membrane. Nuclear membrane consists of two layers.
- The intermembrane space between inner and outer membrane is known as **perinuclear space (cisterns)**.
- The nucleus is filled with nucleoplasm which contains **nucleolus** and **chromatin**.
- Function of nucleus includes control of cell division (DNA replication), protein synthesis.
- DNA and DNA polymerase are the markers of the nucleus.

Endoplasmic Reticulum

- Cisternae have a role in the exchange of materials between the cell and the extracellular fluid.
- **Rough Endoplasmic reticulum (RER)**: Also called granular type of endoplasmic reticulum. It contains ribosomes.
- **Smooth Endoplasmic reticulum (SER)**: Also called agranular type of endoplasmic reticulum. It does not contain ribosomes. SER has enzymes for biosynthesis of lipids and glycoproteins.
- SER is important in hepatocytes for oxidative metabolism and detoxification of many drugs.
- Glucose-6-phosphatase is a marker enzyme for Endoplasmic reticulum.

Ribosomes

- Ribosomes on the RER are involved in synthesis of proteins for export from the cell.
- Free ribosomes present in the cytoplasm synthesize proteins for use within the cell.

Golgi Apparatus (Golgi complex, Golgi body)

- Golgi apparatus moves molecules from endoplasmic reticulum to their destination.
- It is the site where secretions from other organelles are brought and assembled.
- Newly synthesized proteins are transferred from RER and stored in Golgi apparatus temporarily.

Mitochondria

- Mitochondria are the major organelle of a eukaryotic cell.
- Mitochondria contains its own DNA.
- Mitochondrion produces energy in the form of ATP (Adenosine Triphosphate). So it is called as a **“powerhouse of the cell”**.

Lysosomes

- It is a membrane-bound cell organelle and are structurally and chemically spherical vesicles.
- Lysosomes are absent in RBC.
- Lysosomes act as **waste disposal system of the cell**.
- They are responsible for cellular homeostasis.
- They are responsible for autolysis, so it is called as Suicide-bags.

Peroxisomes

- Major function of peroxisomes is in hepatocytes, involved in oxidation of fatty acids.

Cytosol

- It is a colloidal solution of proteins containing nearly 70% water.

Plasma Membrane (cell membrane)

- It is the outer membrane of the cell.
- It is composed of lipids, proteins and carbohydrates.
- Functions include compartmentalization, providing cell shape, cell movement, transport of substances and signal transduction.

TRANSPORT MECHANISMS

There are three types of transport systems, i.e., Diffusion, Facilitated diffusion and Active transport.

- **Diffusion (simple diffusion or passive diffusion)**: It is a process in which molecules of a material that move from an area of higher concentration to an area of lower concentration. Some solutes like O_2 , N_2 , CO_2 , and NO , urea move across cell membrane by diffusion. The net movement of molecule from one side to the other side of the cell membrane continues until concentration on both sides is at equilibrium.
 - **Channels** are pore-forming membrane proteins which facilitate flow of ions across secretory and epithelial cells.

- **Osmosis**: It refers to the spontaneous net movement of solvent molecules through partially permeable (semipermeable) membrane into a region of higher solute concentration. **Aquaporin** selectively conducts water molecules in and out of the cell.
- **Ionophores**: These are lipid-soluble molecules which facilitate transport of ions across the lipid bilayer of the cell membrane.
- **Facilitated Diffusion**: Transport of solutes through membrane transport proteins (carrier molecules) without expenditure of metabolic energy, e.g., Glucose transporters (GLUT), Cl^- / HCO_3^- exchanger, ATP-ADP translocase.



Key Points

- A hypotonic solution is any solution that has a lower osmotic pressure than another solution.
- When the cell is placed into a hypotonic solution it rapidly gains water by osmosis and swells.
- When the cell is placed in the hypertonic solution, it loses water by osmosis and shrinks.



“An ounce of prevention is worth a pound of cure.”
—Unknown



INTRODUCTION TO COMPUTER AND NURSING INFORMATICS

SYNOPSIS

BASIC KEY TERMS

- **Access:** To gain entry to data or reading the data.
- **Analog:** Using signals or information represented by a continuously variable physical quantity such as spatial position, voltage, etc.
- **ASCII:** American Standard Code for Information Interchange.
- **Backup:** Saving any data or information for future.
- **Bios:** Controls input and output operations.
- **Binary:** A **binary** digit, or bit, is the smallest unit of data in computing. It is represented by a 0 or a 1.
- **Bit:** The smallest unit of data in binary.
 - 8 bits = 1 byte
 - 4 bits = 1 nibble
- **Byte:** Byte is a group of binary digits or bits (usually eight) operated on a single unit. A byte is considered as a unit of a memory size.
 - 8 bits = 1 byte
 - 1024 Bytes = 1 kilobyte (KB)
 - 1024 KB = 1 Megabyte (MB)
 - 1024 MB = 1 Gigabyte (GB)
 - 1024 GB = 1 Terabyte (TB)
 - 1000 TB = 1 Petabyte
- **Cache:** It is a hardware or software component that temporarily stores data so future requests for that data can be served faster.

- **CD ROM (Compact Disk Read Only Memory):** From CD ROM, the data can only be read but not edited, manipulated, or deleted.
- **Chip:** Chip is a short form for ‘microchip’. It is a small piece of semiconducting material implanted with an integrated circuit.
- **Code:** Language expressed or understood by the computer.
- **DOS (Disk Operating System):** It is a command based operating system that runs from a hard disk drive. Most commonly refers to MS-DOS (Microsoft Disk Operating System).

HISTORY OF COMPUTERS

- **Charles Babbage** is considered as the “father of the computer”. He originated the concept of a programmable computer (between 1833 and 1871).
- **Microprocessor** was invented by **Ted Hoff, Stanley Mazor and Federico Faggin** (at Intel Inc) in 1970.
- **Microcomputer** was invented by **H. Edward Roberts** in 1975.



Key Points

- A hard disk is divided into tracks which are further subdivided into sectors.
- The central processing unit consists of Control unit, ALU and CPU.
- RAM (Random Access Memory) is a volatile memory.
- Router is a device used to connect a number of LANs (Local Area Networks).
- Fiber optic cable is used as a high speed network backbone media.
- A bit is the smallest unit of the information.
- Buffer is the temporary storage that can be used to compensate for a difference in data rate and data flow between devices.

GENERATIONS OF COMPUTERS

Table 1: Computer generation, period, features and examples

Generation	Period	Features	Examples
First generation	1940–1955	Vacuum tubes and magnetic tapes Slow in speed Very huge in size Limited storage size Punched cards were used to input the data. Processing time for calculation was milliseconds	ENIAC, EDVAC, UNIVAC 1
Second generation	1955–1964	Used Transistor for electronic circuitry. Large in size, relatively slow and expensive Needed air conditioned room as they got heated up very quickly Processing time was microseconds	IBM, 1401, RCA501, Honeywell 200, etc.



Contd...



Generation	Period	Features	Examples
Third Generation	1964–1975	Used integrated circuits (ICs) Keyboards and monitors were invented for input and output Operating system (OS) was designed. PASCAL (high level language) was developed. Processing time was nanoseconds	IBM 360 series and 370 series
Fourth Generation	1975–1980	Used Microprocessor Several input devices were introduced. For example, Mouse, scanners, microphones, etc. Magnetic disk was used as primary external storage device Graphical user Interface (GUI) was developed	IBM personal computers, Apple Macintosh, HP 3000
Fifth Generation	1980–till date	Many new inventions such as laptops, tablets, smartphone, etc. New features include artificial intelligence, natural language processing, user friendly interface, voice command input	Desktop, Laptops, Notebook, Tablets, Supercomputers, etc.

CLASSIFICATION OF COMPUTERS

Based on Function

- **Digital computers:** They operate on inputs that are converted into binary digits (0 or 1). Most of the computers available today are digital computers.
- **Analog computers:** Process analog data, which is of continuous nature as input. Such data includes pressure, voltage, temperature, speed, etc. It measures continuous changes in specific physical quantity, e.g., Speed is measured by the speedometer of a car.
- **Hybrid computers:** Hybrid computers exhibit features of both digital and analog computers. They are highly accurate and very fast in speed. They take analog signals and convert them into digital.

Based on Size and Capacity

- **Mainframe computers** (introduced in 1950s): They are used primarily by large organizations for critical applications (bulk data processing). They are known for their large size, amount of storage, processing power and high level of reliability.

- **Minicomputers** (introduced in 1960s): Much smaller than mainframe computers.

Used in computer-aided designing and small organizations.

- **Micro computers/personal computers** (introduced in the 1980s): Smaller in size and portable. They were single user systems for everyday activities like calculations, documentations, designing and presentations.
- **Supercomputers:** Most powerful and the largest computers. They are made for specific tasks such as defense system, weather forecasting, and complex scientific research.

HARDWARE AND SOFTWARE

Hardware

Hardware refers to the physical parts of the computer system. For example, CPU (central processing unit), Monitor, Keyboard, mouse, etc.

Structure and Parts of Computer

The basic structure of computer comprises of input devices/units, central processing and output devices/units.



Key Points

- The physical component of the computer that anyone can touch is known as “hardware”.
- Silicon is the primary element in computer chips.
- A pixel is the smallest portion of the screen. Entire screen is made by putting millions of pixels together in a matrix form.
- Three color dots form a color pixel on a screen, and these are the following color dots: red, blue, and green.
- The data is stored on the floppy diskette in magnetism form.



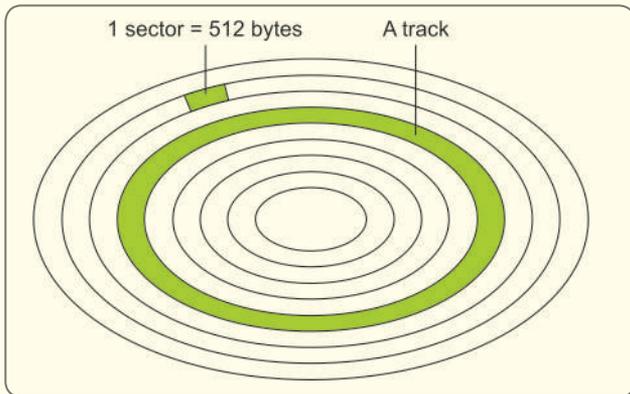
Table 2: Parts of hardware devices

Parts	Devices
Input devices/unit	<ul style="list-style-type: none"> • Mouse • Keyboard • Scanner • Microphone • Web/video camera • Joystick • Light pen • Trackball • Bar code reader • Touch screen • Graphic tablet • Magnetic ink character reader (MICR) • Optical Mark recognition (OMR)

Contd...



Explanation: Sectors are the tracks on the disk surface that are divided into invisible segments.



10. The data that is produced as a result of processing by the CPU is known as: (AIIMS Nagpur NO 2018)

- a. Scanning b. Output
c. Input d. None of these

Explanation:

- **Output** is produced as a result of processing by the CPU. Output devices enable the user to obtain the data which was entered through an input device and processed by CPU by converting the binary codes back into the language the user can read and understand.
- **Scanning** is done by the scanner and is a type of **input**. Hence, **all other options** are incorrect.

11. The full form of CLI: (AIIMS Nagpur NO 2018)

- a. Command Line Interspace
b. Command Line Interface
c. Common Line Interface
d. Common Line Interspace

Explanation: CLI stands for **Command Line Interface**. It is an interface between user and computer that is based on text.

12. One or more users simultaneously on two or more processors are known as: (AIIMS Nagpur NO 2018)

- a. Time sharing b. Multiprogramming
c. Multitasking d. Multiprocessing

Explanation: **Multiprocessing** is the term used when one or more users simultaneously work on two or more processors. It uses two or more CPU within a single computer system.

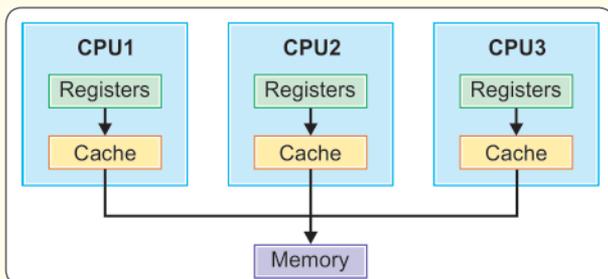


Figure ■ Multiprocessing

13. Hypertext is a text that: (Safdarjung NO 2018):

- a. Appears as superscript
b. Contains links to another document
c. Appears above normal text
d. Has images embodied in the text

Explanation: Hypertext is a text displayed on a computer display or other electronic devices with reference to other text (document) that the reader can immediately access. Hypertext documents are interconnected by hyperlinks, which are typically activated by a mouse click, key press or by touching the screen.

14. What is the process of starting the computer called?

- a. Booting b. Shut down
c. Restart d. Memory

15. CPU stands for:

- a. Control of Power Unit
b. Central Program Unit
c. Central Processing Unit
d. Central Power Unit

16. It is an excellent program for calculation:

- a. M.S. Word b. M.S. Power Point
c. M.S. Excel d. M.S. DOS

17. The small graphical buttons in Windows, which represent folders, data files, program files, etc.

- a. Programs b. Orientation
c. Presentation d. Icons

18. What is the function of Slide Show Button?

- a. Edit a slide
b. Insert a picture in the slide
c. View the slide show
d. Give animation effect to the slide

19. To create a folder on the desktop:

- a. Left click on your desktop, click folder, new
b. Open a Word processor, click file, new
c. Right click on your desktop, click new, folder
d. Open my computer, control panel, click new folder

20. Slides can have:

- a. Title, text, graphs
b. Drawn objects, shapes
c. Clipart, drawn art, visual
d. All of the above

21. Right-justified text is aligned on:

- a. Left margin
b. Between the Left and right margin
c. Right margin
d. Center

22. The function of inserting the content of the clipboard at the insertion point is called:

- a. Cut b. Copy
c. Paste d. Delete

23. A document for storing and calculating numerical data mainly used for financial planning and accounting:

- a. Accounts b. Spreadsheet
c. Business d. Template

24. The function of checking the spelling is called:

- a. Grammar check b. Accessing
c. Formatting d. Spell-check

25. To Boot/Boot up a computer means:

- a. Start the computer b. Install a program
c. Shut Down the computer d. Restart the computer



Ans.

10. b
11. b
12. d
13. b
14. a
15. c
16. c
17. d
18. c
19. c
20. d
21. c
22. c
23. b
24. d
25. a



50. The time it takes to spin the specified sector of hard disk under the read/write head is called: (AIIMS BBS NO 2018)
- Latency
 - Response time
 - Seek time
 - Data transfer rate

Explanation: Seek time is the time that the hard disk controller takes to find a part of stored data.

51. _____ is the device that sends the information about the direction or angle of the stick to the device or application it is controlling. (AIIMS Nagpur NO 2018)
- Scanner
 - Joystick
 - VDU
 - Mouse

Explanation: Joystick is the input device that sends the information about the direction or angle of the stick to the device or application it is controlling. It is also a pointing device like mouse that controls the movement of the cursor. It has two buttons called "triggers". It is used to play video games. They may have one or more push buttons.

52. Devices such as the monitor, speaker and printer are known as:

- Input
- Output
- Processing
- Storage

53. What do the letters ROM stand for?

- Random Organized Memory
- Read Only Memory
- Right Only Memory
- Ready Optional Memory

54. What is the function of the backspace key?

- Deletes the previous Word
- Deletes one character to the right of the cursor
- Deletes the next character
- Deletes one character to the left of the cursor

55. Which of the following is an input device?

- Speaker
- Printer
- Mouse
- Monitor

56. Which one is a storage device?

- Speaker
- Headphones
- Compact Disk
- Modem

57. Computer is an _____ machine that works under the control of stored programs.

- Electrical
- Electronic
- Clinical
- Hydraulic

58. You can delete a file by clicking it and pressing the _____ key.

- Shift
- Control
- Caps lock
- Delete

59. It is referred to as the brain of the computer:

- Output device
- Memory
- Input device
- CPU

60. The type of memory that storage is not erased even if computer is turned off is called:

- RAM
- ROM
- CPU
- ALU

61. The working memory that is used for primary storage is referred to as:

- RAM
- ROM
- CPU
- ALU

62. For a computer to work, it must have a way of receiving commands. This is done through the use of:

- Diskettes
- Printer
- CPU
- Input devices

63. What is the most commonly used input device?

- Keyboard and mouse
- Keyboard and scanner
- Scanner and mouse
- Scanner and keyboard

64. A type of hardware that is used to output the results processed by the computer is called:

- Input device
- Output device
- Storage
- Process

65. Computer process is done using what device in the computer:

- Input device
- Output device
- CPU
- Storage media

66. CD-ROM, Hard drive, USB disk and diskettes are types of:

- Input device
- Output device
- Process
- Storage media

67. A type of storage media that has very high speed and high density that can store large capacity of files:

- USB disk
- Diskette
- CD ROM
- Hard drive

68. _____ is an electronic device capable of handling large arithmetic and logical operations:

- Calculator
- Arm machine
- Cash register machine
- Computer

69. Which of the following are components of CPU?

- Control unit, keyboard
- Control unit, monitor
- Arithmetic logic unit, mouse
- Arithmetic logic unit, control unit

70. RAM stands for:

- Read Access Memory
- Random Access Memory
- Remote Access Memory
- Ready Access Memory

71. In computer, where is RAM located?

- Hard Disk
- Mother board
- SMPS
- Processor

72. ALU stands for:

- Arithmetic Logic Unit
- Arithmetic Logarithmic Unit
- Arithmetic Local Unit
- Analog Logic Unit

73. In computer, saved files are stored at:

- Cache
- RAM
- Hard disk
- SMPS

74. Which of the following is used to make computer chips?

- Copper
- Iron
- Silicon
- Aluminum

75. Find out the odd one:

- Mouse
- Scanner
- Keyboard
- Printer

76. Which of the following storage devices can store maximum amount of data?

- Floppy Disk
- Hard Disk
- DVD
- Blue-ray Disk



Ans.

50. c
51. b
52. b
53. b
54. d
55. c
56. c
57. b
58. d
59. d
60. b
61. a
62. d
63. a
64. b
65. c
66. d
67. d
68. d
69. d
70. b
71. b
72. a
73. c
74. c
75. d
76. b



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Section **B**

Previous Year Papers

104 Papers

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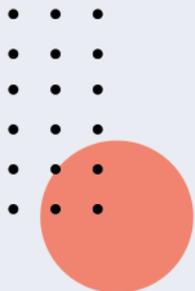
PAPERS COVERED (in Book)

1. AIIMS Raipur (Lecturer) 2021 (New)
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4. Haryana CHO 2021 (New)
5. NORCET (NO) 2020 (New)
6. SKIM (NO) 2020 Paper (New)
7. Combined AIIMS (NO) (Bhopal, Jodhpur, Patna & Raipur) 2020
8. AIIMS Nagpur (NO) 2020
9. AIIMS Patna (NO) 2020
10. Nursing Officer Exam, JIPMER 2020
11. NIMHANS (NO) 2019 (Memory Based) (New)
12. AIIMS Bhatinda (NO) 2019
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14. AIIMS New Delhi (NO) 2019 (Memory Based)
15. AIIMS Raipur Shift I (NO) 2019
16. AIIMS Raipur Shift II (NO) 2019
17. ESIC Shift I (NO) 2019
18. ESIC Shift II (NO) 2019
19. Railway Recruitment Board Shift I (NO) 2019
20. Railway Recruitment Board Shift II (NO) 2019
21. Banaras Hindu University (NO) 2019
22. DSSSB Shift I (NO) 2019
23. Safdarjung (NO) 2019
24. GMCH (NO) 2019



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2. AIIMS NORCET 2020
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4. AIIMS Nagpur (Nursing Officer) 2020
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6. AIIMS Raipur (Nursing Officer) 2019
7. AIIMS Bhatinda (Nursing Officer) 2019
8. AIIMS Raipur (Nursing Officer) 2019; Shift 1
9. AIIMS Raipur (Nursing Officer) 2019; Shift 2
10. AIIMS Raipur (Nursing Officer) 2019; Shift 3
11. AIIMS Bhubaneswar (Senior Nursing Officer) 2019
12. AIIMS New Delhi (Nursing Officer) 2019
13. AIIMS New Delhi (Nursing Officer) 2018
14. AIIMS Nagpur (Nursing Officer) 2018
15. AIIMS Jodhpur (Senior Nursing Officer) Grade I: 2018
16. AIIMS Bhopal (Senior Nursing Officer) 2018
17. AIIMS Bhopal (Nursing Officer) 2018; Shift 1
18. AIIMS Bhopal (Nursing Officer) 2018; Shift 2
19. AIIMS Mangalagiri (Nursing Officer) Grade-II; 2018; Shift 2
20. AIIMS Bhubaneswar (Nursing Officer) 2018
21. AIIMS Raipur (Nursing Officer) 2017; Shift 1
22. AIIMS Raipur (Nursing Officer) 2017; Shift 2
23. AIIMS Raipur (Nursing Officer) 2017; Shift 3
24. AIIMS Raipur (Nursing Tutor) 2017
25. AIIMS Jodhpur & Rishikesh (Nursing Officer) 2017
26. AIIMS Raipur (Senior Nursing Officer) 2017
27. AIIMS Bhopal (Nursing Officer) 2016
28. AIIMS New Delhi (Nursing Officer) 2016
29. AIIMS Bhopal (Senior Nursing Officer) 2016
30. CNCI (Nursing Officer) 2021
31. BFUHS 2021
32. ESIC Paramedical 2019; Shift 1
33. ESIC Paramedical 2019; Shift 2
34. ESIC (Nursing Officer) 2016; Shift 1
35. ESIC (Nursing Officer) 2016; Shift 2
36. ESIC (Nursing Officer) Bangalore Shift 1: 2016
37. ESIC (Nursing Officer) Bangalore Shift 2: 2016
38. ESIC (Nursing Officer) Delhi 2016
39. ESIC (Nursing Officer) Bangalore 2013
40. ESIC (Nursing Officer) Chennai 2012
41. ESIC (Nursing Officer) Grade II: 2011
42. ESIC (Nursing Officer) Ahmedabad 2011
43. Kerala PSC 2021
44. Kerala PSC (Nursing Officer) 2017
45. Kerala PSC (Nursing Officer) 2016
46. Kerala PSC (Nursing Officer) 2014
47. Kerala PSC (Nursing Officer) Grade II: 2011
48. Kerala PSC (Nursing Officer) Set C: 2011
49. Kerala PSC (Nursing Officer) 2010
50. BHU (Nursing Officer) 2019
51. BHU (Nursing Officer) 2018
52. BHU (Nursing Officer) 2016
53. BHU (Nursing Officer) 2015
54. Safdarjung (Nursing Officer) 2019
55. Safdarjung (Nursing Officer) 2018
56. JIPMER (Nursing Officer) 2020
57. JIPMER (Nursing Officer) 2013
58. JIPMER (Nursing Officer) 2012
59. UK State MSc (Nursing Officer) 2016
60. UK Nursing Tutor (Paper I- Set B)
61. RRB (Nursing Officer) 2019; Shift 1
62. RRB (Nursing Officer) 2019; Shift 2
63. RRB (Nursing Officer) 2019; Shift 3
64. RRB (Nursing Officer) 2019; Shift 4
65. RRB (Nursing Officer) 2019; Shift 5
66. RRB Paramedical PHN 2015
67. RRB (Nursing Officer) 2015; Set A
68. RRB (Nursing Officer) 2015; Set B
69. RRB (Nursing Officer) 2015; Set C
70. RRB Secunderabad (Senior Nursing Officer) 2015
71. RRB (Nursing Officer) 2012
72. HPSSC (Nursing Officer) 2016
73. HP (Nursing Officer) 2016
74. RAK MSc Entrance Exam 2018
75. RAK New Delhi Entrance Exam 2017
76. GMCH (Nursing Officer) 2019
77. GMCH (Nursing Officer) 2016
78. Daman and Diu (Nursing Officer) 2018
79. Northern Coal Field Limited, Singrauli (Nursing Officer) 2019
80. PGIMER Chandigarh (Nursing Officer) 2016
81. CHO Haryana 2021
82. CHO Rajasthan 2020
83. CHO Madhya Pradesh 2020
84. CHO Madhya Pradesh 2019 Shift-1
85. CHO Uttar Pradesh 2018
86. RUHS MSc Nursing Entrance Exam 2018
87. RUHS MSc Nursing Entrance Exam 2016
88. RUHS Post Basic Basic Nursing Entrance Exam 2016
89. LNJP Hospital Delhi (Nursing Officer) 2012
90. DSSSB Shift I (NO) 2019
91. DSSSB Shift II (NO) 2019
92. DSSSB PHN 2015
93. DSSSB ANM 2015
94. Jhalawar Hospital and Medical College Society 2012
95. TNPSC Maternal and Child Health Officer 2015
96. RML Hospital (Nursing Officer) 2011
97. Insurance Medical Services (Nursing Officer) 2004
98. RRC (Nursing Officer) 2012
99. SCTIMST (Nursing Officer) 2015
100. Rohtak (Nursing Officer) 2020
101. NIMHANS (Nursing Officer) 2019 (Memory Based)
102. SKIM (Nursing Officer) 2020 Paper
103. Gujarat Staff (Nursing Officer) 2021
104. Jr. Grade Nurse/Jr. Staff Nurse/Jr. Nurse 2020



"Sometimes the remedy is worse than the disease."

—Francis Bacon



NORCET (NO) 2020

- A nurse was giving instruction to a postpartum mother of a newborn with hyperbilirubinemia. Which of the following is an appropriate instruction?**
 - Withhold breastfeeding if phototherapy is continued
 - Substitute breastfeeding with formula feeding
 - Continuous breastfeeding every second hourly
 - Routine supplementary feeds are recommended
- While performing an endotracheal tube (ET) suction, the nurse observed that the client is having sudden severe tachycardia. Which of the following should be the immediate response of the nurse?**
 - Continue the suction
 - Stop suction and perform re-oxygenation
 - Hyperoxygenate before suctioning
 - Call the physician
- A pregnant woman visiting antenatal clinic complains that she gets frequent leg cramps and pain during night. Which of the following is an appropriate intervention to be suggested for the client?**
 - Dorsiflexion with knee extension exercise
 - Complete bed rest is advised
 - Use of compression stockings
 - All of the above
- A 32-year-old male patient is admitted to an acute care psychiatric ward. The patient started showing aggressive tantrum. Which of the following actions by the nurse is a priority?**
 - Wait until the patient calms down on his own
 - Administer sedatives SOS
 - Warn the patient not to do such aggressive act
 - Call for help to settle down situation
- Which of the following drug causes red color urine?**
 - Streptomycin
 - Rifampicin
 - Ethambutol
 - Isoniazid
- A 65-year-old patient admitted in a long-term care facility has developed pressure ulcer. On assessment, the nurse found that the bone is visible and palpable on the wound site. The nurse knows that the stage of the pressure ulcer is:**
 - Stage-I
 - Stage-II
 - Stage-III
 - Stage-IV
- The bullet train project in India is launched with the support of which of the following country?**
 - Russia
 - Germany
 - Japan
 - Korea
- During post-operative care of an infant with a cleft palate repair, the nurse should position the baby in which of the following positions?**
 - On side lying position
 - In an infant seat
 - Prone
 - Supine
- What is the color coding of the bag used in hospitals to dispose of human anatomical wastes such as body parts?**
 - Red
 - Black
 - Yellow
 - Blue
- The vaccine that forms blister and leaves permanent scar in babies is:**
 - DPT
 - BCG
 - Measles
 - Pentavalent
- Identify the device/instrument shown in the photograph:**
 - Doyen's retractor
 - Deaver retractor
 - Anterior vaginal wall retractor
 - HSG canula
- The pelvic shape that has the poorest prognosis from vaginal delivery is:**
 - Platypelloid
 - Anthropoid
 - Android
 - Gynecoid
- Which of the following colored IV cannula is used for Infant?**
 - Grey
 - Pink
 - Yellow
 - Green
- Amputation that includes all levels of thigh amputations from the hip to the knee joint is known as:**
 - Transfemoral amputations
 - Transtibial amputations
 - Lower limb amputation
 - Hip disarticulation amputation
- Therapeutic use of paracetamol is:**
 - Prevent nausea and vomiting
 - Pain relief
 - Motion sickness
 - All of the above
- Surgical complications that result from foreign materials such as surgical sponge or gauze piece accidentally left inside patient's body is known as:**
 - Surgical hemostatic syndrome
 - Gossypiboma
 - Idiopathic necrosis
 - Gossypium hirsutum



Ans.

- c
- b
- a
- d
- b
- d
- c
- c
- c
- b
- a
- a,c
- c
- a
- b
- b

17. Which of the following position is advised to relieve cord compression during labor?
- Supine
 - Left lateral
 - Steep Trendelenburg
 - Lithotomy
18. What is the cerebral tissue perfusion pressure if Blood Pressure is 90/60 and ICP is 18?
- 42 mm Hg
 - 52 mm Hg
 - 60 mm Hg
 - 72 mm Hg

Explanation:

$$\text{CPP} = \text{MAP} - \text{ICP}$$

$$\text{MAP} = [\text{SBP} + 2(\text{DBP})]/3$$

$$\text{MAP} = [90 + 2(60)]/3$$

$$= 210/3$$

$$\text{MAP} = 70 \text{ mm Hg}$$

$$\text{CPP} = \text{MAP} - \text{ICP}$$

$$= 70 - 18$$

$$= 52 \text{ mm Hg}$$

19. All of the following signs and symptoms are indicative of increased intracranial pressure in children; EXCEPT:
- Nausea
 - Vomiting
 - Extreme irritability
 - Decreased Pulse pressure
20. In solar system, which of the following is the third planet from the sun?
- Venus
 - Earth
 - Saturn
 - Mercury
21. What is the suction pressure applied while performing endotracheal tube suction in an adult patient?
- 40-60 mm Hg
 - 50-75 mm Hg
 - 60-100 mm Hg
 - 100-120 mm Hg
22. What is the national currency of the United Kingdom?
- Yen
 - Euro
 - Pound
 - Dollar
23. Which country supplied Rafale jets to India?
- Germany
 - USA
 - France
 - Italy
24. Used nasogastric tube has to be discarded in:
- Yellow bag
 - Red bag
 - Blue bag
 - Black bag
25. Drug allergy is usually tested with an intradermal injection of small dose of a drug. Which of the following is the reason for using intradermal route for testing drug allergy?
- Slow absorption of drug
 - Easy to administer the drug
 - Less painful
 - All of the above
26. Which of the following vaccine should not be frozen and should be discarded if frozen?
- OPV
 - Measles
 - DPT
 - MMR
27. Which of the following antibiotic does not require test dose before administration?
- Augmentin
 - Penicillin
 - Ciprofloxacin
 - Sulbactam

28. Identify the instrument given in the image:



- Surgical scissor
 - Episiotomy scissor
 - Cord cutting scissor
 - Mayo scissor
29. Murphy's sign is seen in which of the following disease condition?
- Liver abscess
 - Splenomegaly
 - Peritonitis
 - Acute cholecystitis
30. Patients scheduled for surgery are instructed to remove nail polish. What is the reason for removing nail polish before surgery?
- To observe clubbing of fingers
 - To detect cyanosis caused by low oxygen level
 - Both a and b
 - None of the above
31. Which of the following gas is most pungent smelling?
- Sevoflurane
 - Isoflurane
 - Both are equally pungent
 - Benzene
32. A 7-year-old child is intermittently bedwetting at least 2 times a week. The nurse anticipates which of the following drug to be prescribed by the physician?
- Desmopressin
 - Diazepam
 - Methylphenidate
 - Fluoxetine
33. Identify the equipment given in the image:



- Nasopharyngeal airway
 - Guedel airway
 - Tracheostomy tube
 - Tongue depressor
34. Identify the image given below:

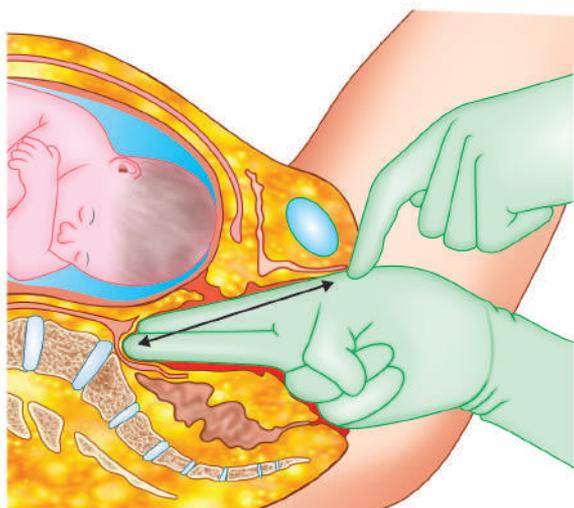


- IV fluid bag
- Enteral feeding bag
- Peritoneal dialysis bag
- Enema bag

**Ans.**

- b
- b
- d
- b
- d
- c
- c
- b
- a
- c
- c
- b
- d
- b
- b
- a
- b
- b
- a
- b
- b
- b

35. Catgut is banned in Europe and Japan. The reason for the ban is due to concern over the risk of developing:
- Cancer due to carcinogenic ingredients
 - Bovine Spongiform Encephalopathy (BSE)
 - Necrotic lesions
 - None of the above
36. As per The Mental Healthcare Act 2017, which of the following statement is NOT TRUE regarding ECT therapy?
- ECT should not be used without muscle relaxant
 - ECT should not be used without anesthesia
 - ECT therapy will not be performed for minors
 - Direct ECT can be given with the consent of the patient
37. The leading anatomical part of the fetus closest to the pelvic inlet of the birth canal refers to:
- Presentation
 - Lie
 - Denominator
 - Position
38. The diameter that is being assessed in the given image is:



- Obstetrical conjugate
 - Anatomical conjugate
 - True conjugate
 - Diagonal conjugate
39. The southernmost state of India is:
- Kerala
 - Tamil Nadu
 - Andhra Pradesh
 - Karnataka
40. A nurse caring for a HIV positive patient got an accidental needle stick injury. Which of the following is an appropriate immediate action following needle stick injury?
- Squeeze the wound to bleed it
 - Wash the wound and surrounding skin with soap and rinse
 - Use bleach or alcohol to clean the wound
 - Put the pricked finger in mouth
41. Which of the following color bag is used to discard resection of gangrene part of the patient?
- Red
 - Blue
 - Yellow
 - Black
42. Ergometrine is commonly used in the treatment of which of the following condition:
- PPH
 - APH
 - Cervical incompetence
 - AV Fistula

43. Jackson Pratt drain was used in all of the following surgeries, EXCEPT:
- Thoracic surgery
 - Head and neck surgery
 - Abdominal surgery
 - Breast reduction and breast reconstruction surgery
44. Oral white patches which are commonly seen in infants and bleed on touching are:
- Pancytopenia
 - Leukoplakia
 - Leucopenia
 - Myeloma
45. Which of the following is a function of fallopian tube?
- Implantation
 - Fertilization
 - Sperm production
 - Ovum production
46. How to measure the uterine contraction of the pregnant lady who is on labor pain?
- Asking question to the lady
 - By using pantograph
 - Assess by placing the hand on abdomen
 - Assess by performing Leopold's maneuver
47. What is the normal CVP pressure?
- 1-2 mm hg
 - 2-6 mm hg
 - 3-8 mm hg
 - 5-8 mm hg
48. Premature destruction of RBC's were seen in which of the following conditions?
- Sickle cell anemia
 - G6PD Deficiency
 - Systemic lupus erythematosus
 - Guillain-Barre Syndrome
49. Identify the size of scalpel blade in the following image:



- 10
- 11
- 12
- 13

50. Identify the X-ray image:



- Pneumothorax
- Tetralogy of fallot
- Flail chest
- Hiatal hernia



Ans.

- b
- d
- a
- d
- b
- b
- c
- a
- b
- b
- b
- c
- b
- b
- b
- c
- b
- b
- b
- a



51. Identify the given condition in the image:



- a. Omphalocele
b. Gangrenous colon
c. Crohn's disease
d. Abdominal hernia

52. Identify the instrument:

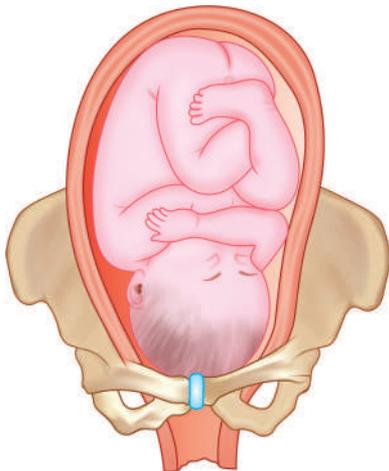


- a. Kelly Hemostatic Forceps
b. Cheatle forceps
c. Sponge holder forceps
d. Magill forceps

53. A female in labor room with cord prolapse should be given which of the following position?

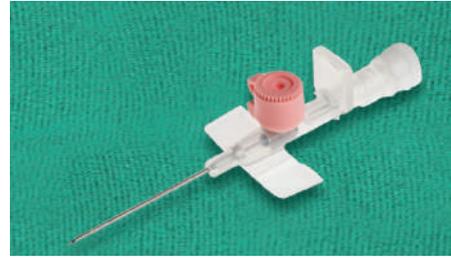
- a. Semi-Fowler's
b. Prone position
c. Lithotomy position
d. Knee chest position

54. Identify the position of fetus shown in the given image:



- a. Left occiput anterior
b. Left occiput posterior
c. Right occiput anterior
d. Right occiput posterior

55. What is the size of IV cannula shown in the image?



- a. 18G
b. 20G
c. 22G
d. 24G

56. Identify the pulse site in the image:



- a. Carotid
b. Occipital
c. Temporal
d. Popliteal

57. What is the normal neonatal heart rate?

- a. 120-160 BPM
b. 100-120 BPM
c. 160-200 BPM
d. 80-100 BPM

58. The needle in the image is used for:



- a. Bone marrow biopsy
b. Laparoscopic procedure
c. Lumbar puncture
d. Blood sampling

59. Dichotic notch of the arterial wave form indicates:

- a. Increased resistance to blood flow
b. Sudden fall in blood pressure
c. Opening of aortic valve
d. Closure of aortic valve

60. While giving CPR what is the correct position of hand?

- a. Above the chest
b. Above the nipples
c. Just below the nipple
d. Lower half of the sternum

61. Which of the following is the first discovered vaccine?

- a. Chicken Pox
b. Rabies
c. Small pox
d. H1N1 Flue



Ans.

51. b
52. b
53. d
54. d
55. b
56. c
57. a
58. b
59. d
60. d
61. c

62. Which of the following vitamin deficiency will cause pernicious anemia?
 a. Vitamin B12 b. Folic acid deficiency
 c. Serum Iron deficiency d. Calcium deficiency
63. Who is the director of AIIMS, New Delhi ?
 (As on September 2020)
 a. Dr. Gitanjali Batmanaben
 b. Dr. Vikas Bhatia
 c. Dr. Ravi Kant
 d. Dr. Randeep Guleria
64. Who is at present the CEO of Google? (As on September 2020)
 a. Mark Zuckerberg b. Sunder pichai
 c. Satya Nadella d. Timothy Donald Cook
65. What is the name of space agency of India?
 a. NASA b. ISRO
 c. WIPRO d. CBI
66. Who is the president of Turkey at present?
 a. Recep Tayyip Erdogan
 b. Vladimir Putin
 c. Yoshihide Suga
 d. Justin Trudeau
67. The machine shown in the image is used for:



- a. Hot wave autoclave b. Sonicator
 c. Fumigation d. HEPA filter
68. Corona virus has spread worldwide. This is known as:
 a. Epidemic b. Pandemic
 c. Zoonotic d. Endemic
69. Corona virus outbreak was first seen in:
 a. Wuhan city in china b. India
 c. UK d. Turkey
70. A patient is taking furosemide as a diuretic. Which of the following is to be included in the diet of the patient?
 a. Nuts b. Vegetable soups
 c. Raw vegetables d. Banana
71. Silent MI is commonly seen in:
 a. CKD b. HTN
 c. Diabetes mellitus d. COPD
72. Who was the founder of Red Cross Society?
 a. Louis Appia b. Gustave Moynier
 c. Théodore Maunoir d. Henry Dunant

73. Which of the following is incorrect about bedsore?
 a. Mobilization will affect bedsore
 b. Moisture will affect bedsore
 c. Friction force will affect bedsore
 d. Nutritional status does not affect bedsore
74. Which of the following drug is contraindicated in pregnant lady?
 a. Heparin
 b. Labetalol
 c. Dolutegravir
 d. Streptomycin
75. Lorazepam challenging test is done to validate the diagnosis of:
 a. Catatonia b. Stupor
 c. Dementia d. Depression
76. Identify the image:



- a. Linear stapler b. Punch biopsy
 c. Bone marrow needle d. Trochar

77. Identify the image:



- a. Circular stapler b. Vein viewer
 c. Biopsy gun d. Trochar

78. Diagnostic test used for DIC:

- a. PT b. INR
 c. PT, aPTT d. DCT, ICT

79. Antimicrobial dressing is composed of which of the following metal?

- a. Copper b. Zinc
 c. Sodium d. Silver

80. Which among the following is added with ORS to control diarrhea?

- a. Copper
 b. Calcium
 c. Zinc
 d. Potassium

81. After 2 hours of birth, baby has acrocyanosis. What should the nurse do?

- a. Inform the physician
 b. Intubate the infant
 c. Document the finding
 d. Give oxygen

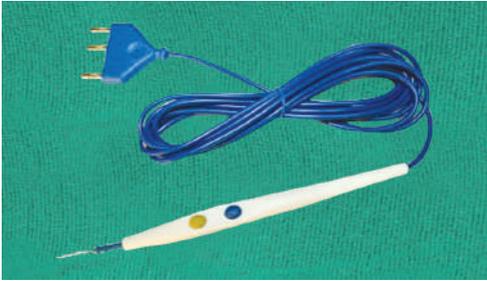


Ans.

62. a
 63. d
 64. b
 65. b
 66. a
 67. c
 68. b
 69. a
 70. d
 71. c
 72. d
 73. d
 74. d
 75. a
 76. a
 77. a
 78. c
 79. d
 80. c
 81. c



82. Identify the image given below:



- a. Monopolar cautery b. Bipolar cautery
c. Harmonic scalpel d. Surgical scalpel

83. Which hormone regulates calcium and phosphate?

- a. Parathyroid Hormone b. TSH
c. FSH d. LH

84. At which week mother feels movement of the baby:

- a. 10-12 Weeks b. 12-14 Weeks
c. 14-16 Weeks d. 18-20 Weeks

85. Which electrolyte causes atrial depolarization?

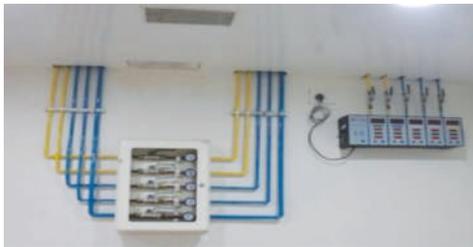
- a. Sodium b. Potassium
c. Calcium d. Phosphate

86. Identify the pelvic grip shown in the image:



- a. Fundal grip b. Lateral grip
c. Pawlik grip d. Deep pelvic grip

87. Blue color pipelines in OT is used to deliver:



- a. Oxygen b. Medical air
c. Vacuum d. Nitrous oxide

88. Lignocaine is used to treat:

- a. MI b. Angina
c. CAD d. Arrhythmia

89. Bandaging of lower legs should be started from:

- a. Ankle b. Foot
c. Knees d. Fingers

90. Pain in the Mc Burneys point is a characteristic of:

- a. Cholelithiasis b. Appendicitis
c. Urolithiasis d. Nephrolithiasis

91. Surgical glove will be discarded in which color biomedical bag:

- a. Yellow b. Black
c. Green d. Red

92. Distended jugular vein is seen in:

- a. Decreased CVP
b. Increased CVP
c. Increased BP
d. Decreased BP

93. The assessment of acute malnutrition in children is done by:

- a. Height
b. Weight
c. BMI
d. Weight for Height

94. Diminished lung sounds and pain during inspiration is a classical sign of:

- a. Hemothorax
b. Pneumothorax
c. Pyothorax
d. Chylothorax

95. Find the next number in the series 10, 9, 7, 4:

- a. 3 b. 2
c. 1 d. 0

96. Which IV fluid you will give with packed RBC?

- a. 3% NaCl b. 5% Dextrose
c. RL d. Normal Saline

97. Identify the following image:



- a. Anesthesia trolley
b. Airway cart
c. Defibrillator
d. Bronchoscopy trolley

98. Clonidine is used to:

- a. Increase Low BP
b. Decrease High BP
c. Increase Pulse rate
d. Decrease Pulse rate

99. The ET Tube size 5.5 is used for:

- a. Infants b. Adults
c. Children d. Geriatric

100. Which of the following vitamin deficiency leads to bleeding gums?

- a. Vitamin C b. Vitamin A
c. Vitamin B d. Vitamin K

101. Which among the following is an output device?

- a. Printer b. Joystick
c. Camera d. Keyboard

102. PDS suture is an example of:

- a. Natural absorbable suture
b. Synthetic absorbable suture
c. Synthetic Non absorbable suture
d. Natural Non absorbable suture

Ans.

82. a
83. c
84. a
85. a
86. b
87. d
88. d
89. b
90. b
91. d
92. b
93. d
94. b
95. d
96. d
97. b
98. b
99. c
100. a
101. a
102. b

103. After death of a person, how long cornea can be preserved?

- a. 2 Hours
- b. 6 Hours
- c. 8 Hours
- d. 12 Hours

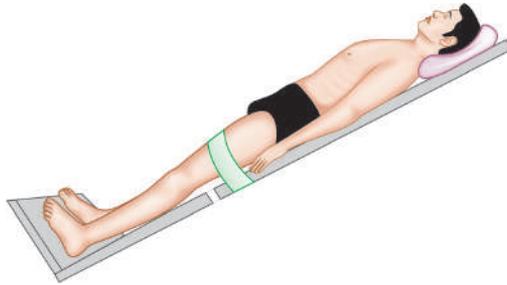
104. Which snake venom causes rapid DIC?

- a. Cobra
- b. Krait
- c. Viper
- d. Bandy-Bandy

105. The primary action of injection paracetamol is:

- a. Antiemetic
- b. Anti-motility
- c. Anti-inflammatory
- d. Antipyretic

106. Identify the position shown in the image:



- a. Trendelenburg
- b. Reverse Trendelenburg
- c. Lithotomy
- d. Sims position

107. Nicotine replacement therapy is used for:

- a. Smoking cessation
- b. Alcohol withdrawal
- c. Opioid withdrawal
- d. Pontine hemorrhage

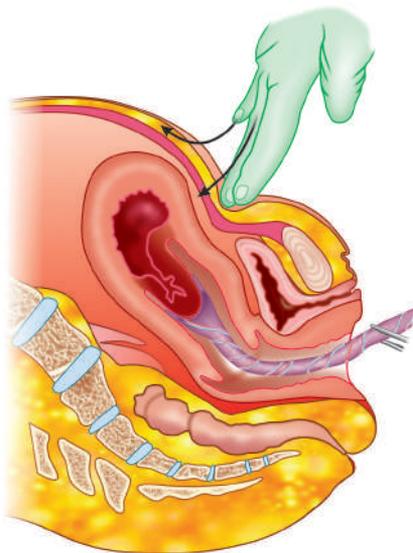
108. Difference between smallest and largest value is known as:

- a. Mean
- b. Average
- c. Range
- d. Standard deviation

109. Which electrolyte is closely monitored in digoxin administration?

- a. Sodium
- b. Calcium
- c. Potassium
- d. Phosphate

110. Identify the placental removal technique shown in the image:

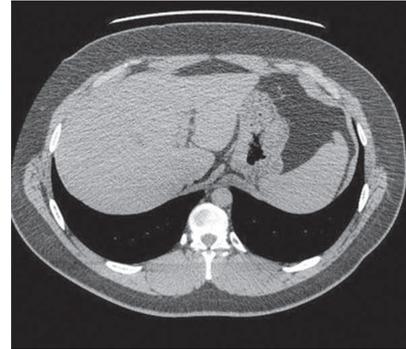


- a. Manual removal
- b. Cord traction by doctor
- c. Expulsion of placenta by fundal pressure
- d. Cesarean session

111. Which of the following is not used before ECT Procedure?

- a. Have light meal before the procedure
- b. Premedication with anticholinergics
- c. NPO
- d. Wash the oils from hair

112. Identify the investigation image shown below:



- a. CT brain
- b. MRI brain
- c. CT KUB
- d. MRI KUB

113. What is meant by posthumous child?

- a. Abused child
- b. Child who lost the parents after birth
- c. Childbirth after death of the biological parent
- d. Child who doesn't have mother

114. Use of vaporizers in OT is to:

- a. Maintain required humidity in OT
- b. Make sure required number of air exchange occurred in OT
- c. Deliver given concentration of volatile anesthetic agent
- d. Disinfect environmental air in OT

115. Which of the following antipsychotic drug causes hyperprolactinemia?

- a. Clozapine
- b. Risperidone
- c. Quetiapine
- d. Olanzapine

116. Clinically used form of lithium is

- a. Lithium Oxalate
- b. Lithium Disodium
- c. Lithium Carbonate
- d. Lithium Permanganate

117. Which blood group is known as universal recipient?

- a. O Negative
- b. O Positive
- c. AB Positive
- d. AB Negative

118. Identify the following image:



- a. Boiler
- b. Autoclave
- c. Fumigator
- d. Vaccine container



Ans.

- 103. b
- 104. c
- 105. d
- 106. b
- 107. a
- 108. c
- 109. c
- 110. c
- 111. a
- 112. c
- 113. c
- 114. c
- 115. b
- 116. c
- 117. c
- 118. b



119. Heimlich maneuver is used to treat:

- Lower airway obstruction
- Nasal obstruction
- Tracheal obstruction
- Upper airway obstruction

120. Extra calories needed during second trimester of pregnancy is:

- 300 Kcal/day
- 500 Kcal/day
- 600 Kcal/day
- 700 Kcal/day

121. Which is not an adverse effect of clozapine?

- Weight gain
- Hypersalivation
- Hepatotoxicity
- Tachycardia

122. Use of epinephrine will cause which of the following symptoms?

- Bradycardia
- Tachycardia
- Increased BP
- Tachypnea

123. In which of the following vaccine, cold chain must be maintained?

- Killed vaccine
- Live vaccine
- Toxoids
- Serums

124. Which of the following is not transmitted by needle stick injury?

- HIV
- Hepatitis B
- Scrub Typhus
- Hepatitis C

125. Cyanotic spell is seen in:

- Atrial septal defect
- Ventricular septal defect
- Tetralogy of Fallot
- Trans position of arteries

126. Side effect of clozapine includes:

- Agranulocytosis
- Nausea
- Vomiting
- Diarrhea

127. Which of the following is primary prevention in skin cancer?

- Applying sunscreen creams and lotions while going out
- Professional skin examination and self-skin examination
- Early diagnosis and initiation of treatment for skin cancer
- Health education regarding treatment compliance of chemotherapy

128. Most painful type of burns is:

- First-degree burns
- Second-degree burns
- Third-degree burns
- Fourth-degree burns

129. Scrubbing will be considered as:

- Chemical disinfection
- Physical disinfection
- Physical sterilization
- Chemical sterilization

130. Which states border is not connected to Madhya Pradesh?

- Maharashtra
- Gujarat
- Rajasthan
- Odisha

131. Which of the following is not a social media platform?

- Twitter
- Instagram
- Facebook
- Windows

132. Atrio-Venous fistula is assessed for:

- Giving IV medication
- Blood sampling
- Arterial BP
- Patency

133. PAP Smear test is used in the diagnosis of:

- Uterine Cancer
- Cervical Cancer
- Valval Cancer
- Ovarian Cancer



Ans.

- d
- a
- c
- b
- b
- c
- c
- a
- a
- b
- b
- d
- d
- d
- b

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GENERAL ENGLISH AND COMPREHENSION



This Chapter Contains:

- Prepositions
- Sentence completion and correction
- Language test
- Comprehension
- Antonyms and synonyms
- Ordering of sentences

PREPOSITIONS

Study the following sentences:

- I am angry with you.
- I saw my teacher in the school.
- He is very kind to us.
- We are sitting on the bench.

In sentence (i), the word 'with' shows the relation between the adjective *angry* and the pronoun *you*. In sentence (ii), the word 'in' shows the relation between the noun *teacher* and the noun *school*. In sentence (iii), the word 'to' shows the relation between adjective *kind* and the pronoun *us*. In sentence (iv), the word 'on' shows the relation between the verb *are sitting* and the noun *bench*. Such words, with, in, to, on, that establish some relation between two words are called prepositions.

Definition

A preposition is a word placed before a noun or a pronoun to show the relation between a noun or pronoun and some other words in a sentence.

The noun or pronoun that is placed after the preposition object is the, Objective Case. Object of the preposition is placed before it. A preposition may have more than one object.

- He gave some money to John, Jill and me.

Here *John, Jill* and *me* are objects of the preposition to.

Position of Preposition

The word preposition (*pre+position*) means 'that which is positioned (placed) before'. Thus, a preposition is usually placed before the noun or pronoun it governs.

A preposition is usually placed before its object but nowadays it is increasingly being placed at the end of the sentence, especially in the relative clauses and when it governs an interrogative pronoun or adverb. For example, this is the book (That) you were looking for. or Where are you going to?

Exceptions

- The preposition can be placed at the end of a sentence:
 - When the object of a preposition is a relative pronoun 'that' (The relative pronouns could also be sometimes omitted). For example, this is the book (that) I was searching for.
 - When the object of a preposition is an interrogative pronoun for example, what are you looking at? Who(m) are you talking about?
- The preposition may be placed sometimes in the: beginning of a sentence for example, about whom are you talking? In which box did you keep my purse?

Kinds of Prepositions

Prepositions are of five different kinds:

- Simple Prepositions:** In, of, an, off, to, up, with, at, by, for, behind, besides, beneath, below, across, between, etc.
- Compound Prepositions:** Without, within, outside, inside, into, etc.
- Double Prepositions:** Outside of, out of, from out, from behind, from beneath, etc.
- Participle Prepositions:** The prepositions which end in ed, and ing, for example, during concerning, considering, etc.
- Phrase Prepositions:** By means of, because of, on account of, in opposition to, with regards to, for the sake of, instead of, on behalf of, with a view to, in the event of, etc.

There are several words which can be used as prepositions as well as adverbs. If the word is used as a preposition, it will have noun or pronoun as its object. (Adverb modifies a verb, adjective or another adverb).

Preposition	Adverb
The lion is in the cage.	Please come in.
He stood before me.	He came here before.
Keep the book on the table.	Let us move on.
He will come after a month.	He arrived soon after.

Study the use of some of the prepositions:

- about** : I asked him *about* his health.
- above** : The water came *above* his shoulders.
His father is *above* fifty.
No book in the shop was *above* ₹80.
This boy weighs *above* seventy pounds.



- across** : (from one side to the other side of): I walked across the road (on the other side of): My school is just across the street.
- after** : I saw him after the meeting.
B comes after A
- against** : We are against bad customs.
He hits his head against the tree.
Place the ladder against the wall.
- along** : We walked along the road.
- among** : He divided his property among his five sons.
New Delhi is among the largest cities of India.
The teacher sat among his students.
- at** : I met him at the railway station.
Look at the picture.
He came at 5 o'clock.
He went to school at (the age of) five.
The boys are at play.
He drove at full speed.
I bought bananas at ₹8 a dozen.
- before** : The meeting took place before Monday.
A comes before B.
We sat before/(in front of) the fire.
- beside** : (at the side of; close to): She sat beside her children.
- besides** : (in addition to) We were ten, besides Suresh.
- between** : The son sat between his father and mother.
I shall see him between 2 p.m. and 3 p.m.
Its price is between ₹10 and ₹15.
Divide the mangoes between the two brothers.
(Between is used to connect two persons, things, etc.)
- by** : He sat by (near) the tree.
Our examination begins on Monday, so we must finish the course by Sunday.
Oranges are sold by dozen.
The work was completed by four laborers.
We can travel by land/sea/air/train/car.
- during** : (throughout, the duration of) It rained during the night.
(at some point of time in the duration) : Somebody came to see me during my absence.
- for** : Is there a train for Mumbai now?
There is a letter for you.
He is preparing for the examination.
We have separate rooms for sleeping in.
Exercise is good for health.
The score is 150 for 6 wickets.
I paid ₹20 for the book. He lived here for two weeks.
- from** : We traveled from Kolkata to Chennai.
I have started teaching him from the first of this month.
He stayed away from home for 3 years.
I have received a letter from my mother.
She drew water from a well.
Steel is made from iron.
Its price has increased from ₹10 to ₹15
- in** : He lived in India for many years.
Does she live in New Delhi?
He was born in a village.
The children were playing in the street.
He has stick in his hand.
I read it in a book.

- This happened in 1986.
It is very cold in January.
He visited me in the morning.
I shall be back in a few days.
She was dressed in red.
(= was wearing red clothes)
- into** : She came into the room.
Throw it into the dustbin.
The water changed into ice.
- of** : I bought a table of wood. (= a wooden table)
He is a boy of eight years.
He is the master of the house.
A leg of the table is broken.
Give me a piece of paper.
He is the best of all the boys.
- on** : There is a jug on the table.
There is a picture on the wall.
They are sitting on the grass.
I went there on Sunday.
He came here on 1st July.
He hit me on the head.
His house is on the main road.
- since** : I have not seen him since 1980.
The two friends have not met since their school days.
- till** : I shall wait till 5 o'clock/next Sunday.
He worked from morning till night.
- to** : He went from Chennai to Delhi.
She went from place to place.
The traffic light changed from red to green.
He worked here from Sunday to Wednesday.
We won by four goals to three.
- with** : This is a cup with a broken handle.
She is a girl with blue eyes.
His pockets were filled with toffees.
Cut the apple with a knife.
I did it with the help of my brother.
I went for a walk with my friends
He did not work with pleasure.
Leave the child with its nurse.
- up to** : What have you been up to (doing) recently?
The children are always up to some kind of mischief.
It is up to you to deal with the problem.
- along** : Jack is walking along the lake.
We sailed along the canal.
The cinema is further along the street.
There are bookshelves all along the wall.
- among, amongst** : There is a boy among the girls.
She comes from a village high up among the mountains.
Amongst the guests was the new Mayor.
Amongst can be used interchangeably where members of group are involved:
You can relax amongst (or among) your friends.

Which Preposition to Use and When

Sometimes it may be a little difficult to decide which preposition to use. Thus, the following prepositions need careful handling:

- In, At:** 'In' is used with the name of continents, countries, states, sizeable territories and large cities. 'At' is used with towns, villages, etc.





He is not at home. He lives at Batala.
 He lives in Punjab.
 He lives at Chandarnagar in Bengal.
 But when we speak of very large places, we usually say:
 He lives in England (not at London).
 He died in Paris in France. (not at Paris)

- At/on:** Compare the following sentences:
 He sat at the table.
 He sat on the table.
 'At' in the first sentence, means that he sat with his chair drawn up to the table.
 'On' in the second sentence means that he sat on top of the table.
- Between, Among:** 'Between' is used in speaking when two persons or things are connected.
 'Among' is used in speaking when more than two persons or things are connected.
 The cat sat between Mohan and Rohan.
USAGE: 'Between' can also relate to more than two persons or things, when we have a definite number in mind.
- Beside, Besides:** 'Beside' means at or by the side of. 'Besides' means in addition to or other than. For example,
 I live beside the stream.
 Besides all this, the corn must be cut.
 Nobody, besides Mohan, could have done it.
- In, within:** 'In' means, at the end of, 'within' means, before the end of.
 He will return in a week. (at the end of week)
 He will return within a week. (before the end of a week)
- At, about:** 'At' is used with a fixed moment; 'about' indicates proximity to a certain time.
 He left work at four o'clock.
 It is about four now.
 Expression like : at about four o'clock, at about the time he left work, are therefore wrong.
- Till, By:** 'Till' means not earlier than; 'by' means not later than.
 For example, I was kept waiting till 3 o'clock (up to 3 o'clock).
 or I shall return home by 3 o'clock (not later than 3 o'clock)
- Since, for:** 'Since' as a preposition is used before a noun or phrase denoting some point of time; 'for' is used to denote a period of time; for example, he has been working since morning.
 I have been doing nothing for two hours.
 I have been living in Mumbai since 1980.
Note:- Since is preceded by a verb in perfect tense.
- From:** 'From' is used before noun or phrase denoting some point of time, but unlike since it is used with all the tenses; as
 Ram Swarup works from morning to evening.
 I shall join office from Monday.
- Before, For:** 'Before' is used to denote a point of future time. 'For' is used in negative sentences to denote a period of future time; as
 I shall finish my work before next month. (during this month)
 I am not resuming duty for week yet. (until a week has passed)
- On, Over:** 'On' denotes actual contact with some object; 'over' does not do so.
 Put the pen on the table.
 Thick mist hung over the forest.
- To, till/until-till:** means up to:
 These are used with 'from'. 'To' cannot be used without

'from' though 'however' can be used alone.
 We work from 8 am to 4 pm.
 We work till 4 pm.
 Until cannot be used with a negative verb.

Some Important Distinctions

- By and with:** 'By' is used before the doer, 'with' before the name of an instrument, with which the action is done. For example, the cake was cut by her with a knife.
- Between and among:** 'Between' is used with two persons or things, 'among' is used with more than two persons or things. For example, the father divided the property between his two sons. Sweets were distributed among children.
- Beside and besides:** 'Beside' means by the side of; 'besides' means in addition to, for example, the temple stands beside the Gurudwara. Besides food, we gave the beggar some money.
- On and upon:** 'On' is used for things at rest, 'upon' for things in motion. We sat on the ground. The dog jumped upon the table.
- Under and underneath:** 'Underneath' is used for things only. For example, hide this underneath that box. A captain works under a Major.

EXERCISES

A. Fill in the blanks with appropriate prepositions.

at, in, on, by, to, with, of, after, into, about, from

- The two brothers met _____ a long time.
- She asked me _____ my business.
- I am coming _____ the railway station.
- They live _____ Kolkata.
- They marched _____ the room.
- There are no books _____ the table.
- They won _____ four goals _____ nil.
- He is an old man _____ white hair.
- The chair is made _____ iron.
- He reached here _____ 5 p.m.

B. Fill in the blanks with appropriate prepositions.

with, among, at, since, by, till, beside, for, to, from, besides.

- They have not visited us _____ 1984.
- I have been waiting for her _____ two days.
- He divided the money _____ his four children.
- I have two other pens _____ this.
- Don't disturb me _____ 6 p.m.
- I sat _____ my friend.
- I bought oranges _____ ₹15 a dozen.
- I must finish my work _____ Monday.
- The crow flew _____ branch _____ branch.
- I shall go there _____ my friend.

C. Fill in the blanks with appropriate prepositions.

along, against, for, above, with, in, before, across, between, of

- How many boys in the class weigh _____ sixty pounds?
- His school is situated _____ the road.
- Finish this work _____ sunset.
- He walked slowly _____ the road.
- Don't stand _____ the electric poll.
- B comes _____ A and C.





7. Is there a parcel _____ me?
8. I read it _____ the newspaper.
9. I bought a piece _____ cloth.
10. He filled the cup _____ tea.

D. Fill in the blanks with appropriate prepositions.

1. He is not fit _____ this job.
2. He took the initiative _____ this matter.
3. You are almost mad _____ anger.
4. He is obliged _____ you _____ your kindness.
5. Kalyan is very poor _____ English.
6. I shall stand surely _____ you.
7. You are not afraid _____ him.
8. I am acquainted _____ him.
9. You are always busy _____ writing letter.
10. This pen is different _____ that one.

E. Fill in the blanks with appropriate prepositions.

1. You are quick _____ solving sums.
2. Vikram has fondness _____ table tennis.
3. I had an interview _____ the headmaster.
4. Are we not entitled _____ patient hearing?
5. Monika is gifted _____ a sweet voice.
6. We are opposed _____ this policy of yours.
7. Songs are proper _____ this function.
8. She has no interest _____ studies.
9. He has no eagerness _____ anything.
10. She is engaged _____ my elder brother.

F. Fill in the blanks with appropriate prepositions.

1. It is foolish to quarrel _____ anybody _____ a trifle.
2. He is blind _____ one eye.
3. I am sorry I cannot comply _____ your request.
4. Why should you be envious _____ his riches?
5. She was convinced _____ my sincerity.
6. It has been drizzling _____ Monday.
7. Tibet is _____ the North of India.
8. His sister was married _____ a doctor.
9. He warned me _____ the danger.
10. Have you disposed _____ your goods?

Fill in the Blanks by Choosing the Correct Words

1. **I will do it for the good _____ the team.**
 - a. of
 - b. at
 - c. either could be used here
 - d. with
2. **She is good _____ learning languages.**
 - a. at
 - b. for
 - c. either could be used here
 - d. to
3. **He was a horrible man; I could not see any good _____ him.**
 - a. of
 - b. in
 - c. either could be used here
 - d. from
4. **He went abroad _____ the morning flights.**
 - a. by
 - b. from
 - c. with
 - d. off

5. **Please accompany me _____ my room to collect the material.**

- a. for
- b. to
- c. up to
- d. into

6. **Mohan belongs _____ the upper strata of the society.**

- a. from
- b. for
- c. to
- d. of

7. **He showed much affection _____ me when I met him recently.**

- a. for
- b. to
- c. with
- d. towards

8. **The trend _____ price rise is unfortunate.**

- a. in
- b. of
- c. for
- d. with

9. **This remark is not _____ your favor.**

- a. to
- b. for
- c. in
- d. of

10. **He slipped away _____ the crowd to avoid arrest.**

- a. of
- b. from
- c. by
- d. with

11. **He sent _____ his resignation last night.**

- a. for
- b. up
- c. in
- d. to

12. **He passed _____ this information to me.**

- a. out
- b. on
- c. off
- d. away

13. **He is a candidate _____ examination.**

- a. to
- b. for
- c. in
- d. at

14. **We have entered _____ partnership of a reputable firm.**

- a. into
- b. in
- c. for
- d. to

15. **Government has set up a court _____ inquiry to ascertain the facts.**

- a. for
- b. of
- c. about
- d. on

16. **He was very good _____ us when we were in trouble.**

- a. at
- b. to
- c. be
- d. with

Complete the Sentences with Correct Words

1. **Each occupation has its own _____ ; bankers, lawyers and computer professionals, for example, all use different languages which outsiders have difficulty in following.**
 - a. Merits
 - b. Disadvantages
 - c. Rewards
 - d. Jargon
 - e. Problems
2. **Biological clocks are of such _____ adaptive value to living organisms, that we would expect most organisms to _____ them.**
 - a. Clear – avoid
 - b. Meager – evolve
 - c. Significant – eschew
 - d. Obvious – possess
 - e. Ambivalent – develop





3. Many people at that time believed that spices help preserve food; however, Hall found that many marketed spices were bacteria, moulds and yeasts.
- Devoid of
 - Teeming with
 - Improved by
 - Destroyed by
 - Active against
4. If there is nothing to absorb the energy of sound waves, they travel on, but their intensity as they travel further from their source.
- Erratically - mitigates
 - Eternally - alleviates
 - Forever - increases
 - Steadily - stabilizes
 - Indefinitely - diminishes
5. The intellectual flexibility inherent in a multicultural nation has been in classrooms where emphasis on British-American literature has not reflected the cultural of our country.
- Eradicated - unanimity
 - Encouraged - aspirations
 - Stifled - diversity
 - Thwarted - uniformity
 - Inculcated - divide
6. In the Middle Ages, the of the great cathedrals did not enter into the architects' plans; almost invariably a cathedral was positioned haphazardly in surroundings.
- Situation - incongruous
 - Location - apt
 - Ambience - salubrious
 - Durability - convenient
 - Majesty - grandiose
7. Archeology is a poor profession; only sums are available for excavating sites and even more amounts for preserving the excavations.
- Paltry - meager
 - Miniscule - substantial
 - Average - augmented
 - Judicious - penurious
 - Modest - generous
8. The student was extremely foolhardy; he had the to question the senior professor's judgment.
- Wisdom
 - Temerity
 - Interest
 - Trepidation
 - Condescension
9. The formerly water of the lake have been polluted so that the fish are no longer visible from the surface.
- Muddy
 - Tranquil
 - Stagnant
 - Pellucid
 - Rancid
10. After the accident, the nerves to her arm were damaged and so the muscles through disuse.
- Atrophied
 - Contracted
 - Elongated
 - Invigorated
 - Dwindled
11. Some critics maintain that Tennyson's poetry is uneven, ranging from the to the
- Sublime - elevated
 - Trite - inspired
 - Vacuous - inane
 - Succinct - laconic
 - Sonorous - voluble
12. After grafting there is a of lymphocytes in the lymph glands; the newly produced lymphocytes then move in to attack the foreign tissue.
- Diminution
 - Proliferation
 - Obliteration
 - Paucity
 - Attraction
13. One the new scheme is that it might actually just those applicants that it was intended to encourage.
- Highlight of - stimulate
 - Feature of - attract
 - Problem with - induce
 - Attraction of - intimidate
 - Drawback of - daunt
14. Corruption is in our society; the integrity of even senior officials is
- Growing - unquestioned
 - Endangered - disputed
 - Pervasive - intact
 - Rare - corrupted
 - Rife - suspect
15. In their day to day decision making, many senior managers do not follow the rational model favored by orthodox management experts, but rather rely on intuitive processes that often appear and
- Cerebral - considered
 - Heretical - judgmental
 - Conscientious - logical
 - Irrational - iconoclastic
 - Capricious - deliberate

Fill the Double Blanks in Sentences with Correct Words

A. Directions (1 to 5): In each of the following questions, there are two spaces in each of the given sentences. Below each sentence, there are five pairs of words denoted by numbers (a), (b), (c), (d) and (e). Find out, which pair of words can be filled up in the blanks in the sentences in the same sequence to make the sentence meaningfully complete:

- Our latest battle plan _____ some projects _____ at saving the earth's biological diversity.
 - Finishes, stirring
 - Covers, aimed
 - Finances, looking
 - Encloses, looked
 - Excludes, arriving
- Unless the authorities adopt the principle _____ the strategies cannot become _____.
 - Whole-heartedly, successful
 - Fully, defunct
 - Finally, obsolete
 - Legitimately, noteworthy
 - Logically, trivial





3. Trying to _____ a team without a good and simple system is like trying to drive the car without the steering wheel.
- Form, working
 - Place, exploratory
 - Organize, empowering
 - Make, guidance
 - Achieve, developmental
4. _____ members of group often _____ influence the outcome of a consensus forecast.
- Fixed, exert
 - Majority, rightly
 - Oral, legitimately
 - Minority, inadvertently
 - Dominant, unduly
5. Transforming _____ bureaucracies into dynamic, this task of customer-driven organizations is _____ under prevailing circumstances.
- Ideal, important
 - Lazy, undesirable
 - Inefficient, challenging
 - Civilized, ineffective
 - Lethargic, insurmountable

B. Directions (1 to 10): In each of the following questions, there are two blanks in the given sentences. Below each sentence, there are five pairs of words denoted by number (a), (b), (c), (d) and (e). Find out, which pair of words can be filled up in the blanks in the sentences, in the same sequence, to make the sentence meaningfully complete:

1. The Deputy Manager _____ to resign because all his proposals were _____ down by his superiors.
- Planned, thrown
 - Gave, held
 - Began, kept
 - Willing, knocked
 - Threatened, turned
2. The counter clerk was very busy and.....not pay.....to Sameer's request.
- Can, help
 - Could, cooperation
 - Had, cash
 - Did, attention
 - Certainly, acceptance
3. He was initially _____ at the suggestion but was soon _____ it himself.
- Angered, rejecting
 - Shocked, advocating
 - Impressed, negating
 - Thrilled, propagating
 - Suspicious, trusting
4. Shalini was not _____ by the criticism and paid no _____ even when her best friend talked against her.
- Bothered, attention
 - Troubled, brained
 - Threatened, warning
 - Deterred, heed
 - Shaken, indication
5. She was _____ because all her plan had gone _____.
- Happy, selected
 - Dejected, splendidly
 - Distraught, awry
 - Frustrated, magnificently

6. He preaches liberal views but in practice, he is not _____ and is _____ narrow minded than almost any other person.
- Tough, openly
 - Tolerant, more
 - Ambitious, hardly
 - Acceptable, genuinely
 - Approachable, less
7. Ravi _____ a bit _____ he was not invited by his friend to attend the party.
- Annoyed, before
 - Angered, since
 - Expressed, than
 - Grumbled, when
 - Surprised, about
8. He is _____ to _____ any kind of work with due sincerity.
- Found, perform
 - Reluctant, entrust
 - Determined, undertake
 - Eager, avoid
 - Willing, ignore
9. Children are more _____ than adults, it is _____ their quickness in learning a new language.
- Intelligent, disproved by
 - Adaptable, reflected in
 - Conservative, seen in
 - Susceptible, demonstrated in
 - Resourceful, proportionate to
10. _____ of crops was due to continuous _____.
- Loss, drought
 - Ruin, draft
 - Failure, drought
 - Depreciation, drift
 - Success, rains

COMPREHENSION

Comprehension of a passage means understanding it thoroughly. It forms a very good exercise for intelligent reading, judicious selection and correct expression. It is meant to test the intelligence of the student to express his thoughts independently in a simple, clear, direct, correct and precise manner. This form of exercise eliminates memorizing and forms the stepping stone to precis-writing.

How to Proceed with the Passage

- Before trying to answer the questions given at the end, you should read the passage two or three times till you understand it fully. After that, the questions at the end are to be read and the passage should be read once again paying particular attention to the questions asked.
- Then you should find out the central idea or the main idea or thought of the passage. This forms the title of the passage. The title or the heading should not be in the form of a sentence. It should either be a word or a phrase or a proverb or an expression which gives the theme of the passage. Generally, the title or the heading is found in the beginning or the end of the passage. All the important words of the title or the heading should be written with a capital letter.
- The questions should be read and answered carefully. The language of the passage should not be copied as far as possible. Answers must be simple, brief, grammatically correct and direct.
- Each answer should be given separately. It should be clearly numbered and its number should correspond to that of the question. Several answers should never be put together in one paragraph.



“When you are sick of your sickness, you are no longer sick.”
—Chinese Proverb



SPORTS

Olympic 2021

- Theme of this year’s Olympics and Paralympics is ‘United by Emotion’. The theme reflects the unifying power of sports.
- The official Olympic motto is ‘Citius, Altius, Fortius’ which means ‘Faster, Higher and Stronger.’

Brisbane to host 2032 Olympics

- **Brisbane** won the right to host the 2032 Olympics at the 138th Session of International Olympic Committee (IOC) members in Tokyo on 21 July, 2021.
- This will bring Olympic Games back to Australia 32 years after Sydney hosted the event in 2000. Melbourne was the first Australian city to host the Olympics before that in 1956.

World Athletics Ranking 2021

- Javelin thrower Neeraj Chopra has finished at number 2 rank in the World Athletics ranking after securing Gold Medal at the Tokyo Olympics 2020.
- Neeraj Chopra created history on August 7, 2021 by winning Gold Medal.
- He threw the javelin to a distance of 87.58 m.

Four New Sports Included in Tokyo Olympic

Four new sports have been introduced in the Tokyo Olympics. They are karate, skateboarding, surfing and sport climbing.

Canada Pulls out of Tokyo Olympics

Canada became the first major country to pull out of the Tokyo Olympics over coronavirus fears.

Indian Medalist in Tokyo Olympics

(*This update is as on August 18, 2021. The final list of medalist will be released after the Olympics)

Mirabai Chanu	Silver Medal in Weight Lifting (Women’s 49 kg)
Indian Hockey Team	Bronze Medal in Men’s Hockey tournament
PV Sindhu	Bronze Medal in Women’s Single Badminton

Contd...

Lovlina Borgohain	Bronze Medal in Women’s Welterweight Boxing
Ravi Kumar Dahiya	Silver Medal in Men’s 57 kg Wrestling
Bajrang Punia	Bronze Medal in Men’s Freestyle 65 kg Wrestling
Neeraj Chopra	Gold Medal in Men’s Javelin Throw: 87.58 (First Gold Medalist from India in Olympics 2021)

Euro Cup 2020

Euro 2020, was the 16th UEFA European Championship, the quadrennial international men’s football championship of Europe organized by the Union of European Football Associations (UEFA).

Italy wins the Euro 2020 cup after defeating England in the final.

Gianluigi Donnarumma, the Italy goalkeeper, had clinched the player of the tournament award.

Portugal captain Cristiano Ronaldo on July 11, 2021, won the European Golden Boot at Euro 2020.

World Badminton Championships

- The Badminton World Federation on July 13, 2021, announced that India will host the World Badminton Championship in 2026.
- India will be hosting the world championship for the second time. The previous event was hosted in Hyderabad, India in 2009.

Tennis

Grand Slams 2021 Winners

Australian Open 2021 Winners	
Men’s Singles	Novak Djokovic (Serbia)
Women’s Singles	Naomi Osaka (Japan)
Men’s Doubles	Ivan Dodig of Croatia and Filip Polášek (Slovakia)
Women’s Doubles	Timea Babos (Hungary) and Kristina Mladenovic (France)
Mixed Double	Barbora Krejčíková (Czech Republic)-Nikola Pietrangeli (Croatia)
Wimbledon Open 2021 Winners	
Men’s Singles	Novak Djokovic (Serbia)
Women’s Singles	Ashleigh Barty (Australia)

Contd...



Men's Doubles	Nikola Mektić and Mate Pavić
Women's Doubles	Hsieh Su-wei and Elise Mertens
Mixed Double	Neal Skupski and Desirae Krawczyk
Italian Open 2021 Winners	
Men's Singles	Rafael Nadal (Spain)
Women's Singles	Iga Swiatek (Poland)
Men's Doubles	Nikola Mektic (Croatia), Mate Pavic (Croatia)
Women's Doubles	Sharon Fichman (Canada), Giuliana Olmos (Mexico)
French Open Tennis 2021 Winners	
Men's Singles	Novak Djokovic (Serbia)
Women's Singles	Barbora Krejčíková (Czech Republic)
Men's Doubles	Pierre-Hugues Herbert (France) and Nicolas Mahut (France)
Women's Doubles	Barbora Krejčíková (Czech Republic) and Kateřina Siniaková (Czech Republic)
Mixed Double	Desirae Krawczyk (United States) and Joe Salisbury (United Kingdom)

US Open line judges to be replaced by technology on all courts in 2021

The United States Tennis Association announced on May 24, 2021, that it will be implementing the use of electronic line calling (Hawk-Eye Live Electronic line-calling) on all courts at the Final Grand Slam of 2021.

CRICKET

ICC World Test Championship

New Zealand skipper Kane Williamson and Ross Taylor helped steer the Kiwis to an 8-wicket victory over India in the final hour of a nail-biting reserve day with a boundary from Taylor.

ICC Men's Test Team Ranking

Rank	Team
1	New Zealand
2	India
3	Australia
4	England
5	Pakistan
6	West Indies
7	South Africa
8	Sri Lanka
9	Bangladesh
10	Zimbabwe

ICC Hall of Fame 2021 Inductees

- **Aubrey Faulkner:** The great South Africa all-rounder, Aubrey Faulkner was the first Hall of Fame inductee.

- **Learie Constantine:** The West Indies Legend, Sir Learie Constantine is regarded as one of the first great West Indies all-rounders.
- **Ted Dexter:** The England cricketer was known as Lord Ted because of the way he imposed himself on the crease.
- **Vinoo Mankad:** The Indian cricketer known as one of India's greatest all-rounders and finest left-arm spinner ever.
- **Desmond Haynes:** The West Indies cricketer.
- **Andy Flower:** The Zimbabwe cricket legend.

Special Inductees

- **Monty Noble:** The Australian legend was known as one of the greatest Australian all-rounders.
- **Stan McCabe:** The Australian cricketer.
- **Bob Willis:** The England cricketer known as one of the best fast bowlers in the world.
- **Kumar Sangakkara:** The veteran Sri Lankan wicketkeeper-batsman.

ICC Awards of the Decade

- **Sir Garfield Sobers Awards for ICC Men's Player of the Decade:** Virat Kohli (India)
- **Rachael Heyhoe Flint Award for ICC Women's Player of the Decade:** Ellyse Perry (Australia)
- **ICC Spirit of Cricket Award of the Decade:** MS Dhoni (India)
- **ICC Men's Test Player of the Decade:** Steve Smith (Australia)
- **ICC Men's ODI Player of the Decade:** Virat Kohli (India)
- **ICC Men's T20I Player of the Decade:** Rashid Khan (Afghanistan)
- **ICC Men's Associate Player of the Decade:** Kyle Coetzer (Scotland)
- **ICC Women's ODI Player of the Decade:** Ellyse Perry (Australia)
- **ICC Women's T20I Player of the Decade:** Ellyse Perry (Australia)
- **ICC Women's Associate Player of the Decade:** Kathryn Bryce

ICC Team of the Decade

ICC's Men's T20 Team of the Decade

MS Dhoni (c), Rohit Sharma, Chris Gayle, Aaron Finch, Virat Kohli, AB de Villiers, Glenn Maxwell, Kieron Pollard, Rashid Khan, Jasprit Bumrah and Lasith Malinga.

ICC's Men's ODI Team of the Decade

MS Dhoni (c), Rohit Sharma, David Warner, Virat Kohli, AB De Villiers, Ben Stokes, Shakib Al Hasan, Imran Tahir, Mitchell Starc, Trent Boult and Lasith Malinga.

ICC's Men's Test Team of the Decade

Virat Kohli (c), Alistair Cook, David Warner, Kane Williamson, Steve Smith, Kumar Sangakkara, Ben Stokes, R Ashwin, Dale Steyn, Stuart Broad and James Anderson.

ICC Top Test Rankings of 10 Teams

Rank	Team
1	Australia
2	New Zealand
3	India
4	England

Contd...





Rank	Team
5	Sri Lanka
6	South Africa
7	Pakistan
8	West Indies
9	Bangladesh
10	Zimbabwe

MISCELLANEOUS SPORTS

Sudhanshu Mittal

Sudhanshu Mittal is re-elected as the President of Kho-Kho Federation of India.

Abhimanyu Mishra

Abhimanyu Mishra, a 12-year-old Indian-origin boy, became the youngest ever Grandmaster in Chess breaking the record of 12 years and 7 months set by GM Sergey Karjakin in 2002.

T20 World Cup

The ICC Men's T20 World Cup 2021 will be staged in the UAE and Oman due to the current COVID-19 situation in India. Now this will be held from October 17 till November 14.

ISSF World Cup 2021

Indian shooter Rahi Sarnobat won India's first gold medal in the 25m pistol event at the International Shooting Sport Federation (ISSF) World Cup.

Dingko Singh

Dingko Singh, Asian Games gold medal-winning former boxer, passed away on June 10, 2021. He was awarded with Padma Shri.

FIFA World Cup 2021

This year FIFA World Cup will be hosted by Japan in December.

Etienne Glichitch Award

Hockey India was honored prestigious Etienne Glichitch Award on May 21, 2021, for its contribution and work toward the growth and development of Hockey in India.

Laureus Sports Awards 2021

Laureus World Sportsman of the Year: Rafael Nadal
 Laureus World Sportswoman of the Year: Naomi Osaka
 Laureus World Team of the Year: Bayern Munich
 Laureus World Breakthrough of the Year: Patrick Mahomes
 Laureus World Comeback of the Year: Max Parrot
 Laureus Sport for Good: KICKFORMORE by KICKFAIR
 Laureus Lifetime Achievement Award: Billie Jean King
 Laureus Athlete Advocate of the Year: Lewis Hamilton
 Laureus Sporting Inspiration: Mohamed Salah
 Laureus Sporting Moment of the Year: Chris Nikic

Diego Maradona

Football legend from Argentina, Diego Maradona passed away on November 25, 2020, after suffering a heart attack. He was 60-years old.

AWARDS & AWARDEE

Awards	Awardees
July 2021	
Best Film Award in the Documentary section (Best Biographical)	Decoding Shankar'
Humboldt Research Award in Economics	Kaushik Basu
Olympic Laurel at the Tokyo Games	Muhammad Yunus
Oeil d'Or (Golden Eye) award for best documentary at the 74th Cannes Film Festival	Director Payal Kapadia's, 'A Night of Knowing Nothing'
June 2021	
International Dublin Literary Award 2021 for her novel 'Lost Children Archive'	Valeria Luiselli
WHO Director-General Special Recognition Award'	Union Health Minister Dr Harsh Vardhan
International Business Book of the Year Award 2021	Nitin Rakesh and Jerry Wind
International Booker Prize 2021 for 'At Night All Blood Is Black'	David Diop
2021 Nature TTL Photography Awards for his photo of an Orangutan clinging to a tree	Thomas Vijayan
Land for Life Award by the United Nations Convention to Combat Desertification (UNCCD)	Familial Forestry
'Outstanding Civil Engineering Achievement Award' for 2020	Delhi Metro
'The Order of Polar Star'	RK Sabharwal
May 2021	
"Order of Rising Sun" by the Japanese Government	Shyamala Ganesh
2021 laureate of UNESCO/ Guillermo Cano World Press Freedom Prize	Maria Ressa (Rapple's CEO)
Icon Award at the 2021 Billboard Music Awards	Pink (Singer)
ICC Men's Player of the Month for April 2021	Babar Azam (Pakistan)
ICC Women's Player of the Month for April 2021	Alyssa Healy (Australia)
1st Indian to win the 15th Sheikh Zayed Book Award	Dr Tahera Qutbuddin

Contd...



3 GENERAL INTELLIGENCE AND REASONING ABILITY



NUMBER SERIES

Directions to solve: In each series, look for the degree and direction of change between the numbers. In other words, do the numbers increase or decrease, and by how much.

- Look at this series: 2, 1, (1/2), (1/4), ... What number should come next?
 - 1/3
 - 1/8
 - 2/8
 - 1/16
- Look at this series: 22, 21, 23, 22, 24, 23, ... What number should come next?
 - 22
 - 24
 - 25
 - 26
- Look at this series: 3, 4, 7, 8, 11, 12, ... What number should come next?
 - 7
 - 10
 - 14
 - 15
- Look at this series: 31, 29, 24, 22, 17, ... What number should come next?
 - 15
 - 14
 - 131
 - 12
- Look at this series: 201, 202, 204, 207, ... What number should come next?
 - 205
 - 208
 - 210
 - 211
- Look at this series: 7, 10, 8, 11, 9, 12, ... What number should come next?
 - 7
 - 10
 - 12
 - 13
- Look at this series: 53, 53, 40, 40, 27, 27, ... What number should come next?
 - 12
 - 14
 - 27
 - 53
- Look at this series: 21, 9, 21, 11, 21, 13, 21, ... What number should come next?
 - 14
 - 15
 - 21
 - 23
- Look at this series: 58, 52, 46, 40, 34, ... What number should come next?
 - 26
 - 28
 - 30
 - 32
- Look at this series: 14, 28, 20, 40, 32, 64, ... What number should come next?
 - 52
 - 56
 - 96
 - 128
- Look at this series: 544, 509, 474, 439, ... What number should come next?
 - 404
 - 414
 - 420
 - 445
- Look at this series: 80, 10, 70, 15, 60, ... What number should come next?
 - 20
 - 25
 - 30
 - 50

ANALOGY TEST

- 'Bull' is related to 'cow' in the same way as 'Horse' is related to:
 - Animal
 - Mare
 - Stable
 - Meat
 - 'Dearth' is related to 'Scarcity' in the same way as 'Substitute' is related to:
 - Replace
 - Rumor
 - Destroy
 - Assume
 - 'Hate' is related to 'Love' in the same way as 'Create' is related to:
 - Make
 - Renovate
 - Destroy
 - Built
 - 'Sailor is related to 'Ship' in the same way as 'Lawyer' is related to:
 - Legal
 - Law
 - Court
 - Ruling
 - 'Numismatic' is related to 'coin' in the same way as 'Paleontology' is related to:
 - Earth
 - Soil
 - Fossils
 - Stones
- Directions for 6-10:** In each of the questions below, choose the group of words that shows the same relationship as given in every question.
- Ink: Pen: Paper**
 - Watch: Dial: Strap
 - Book: Paper: Words
 - Colour: Brush: Canvas
 - Farmer: Plough: Field
 - Mouth: Teeth: Chew**
 - Eyes: Lashes: See
 - Head: Brain: Think
 - Skin: Sweat: Touch
 - Feet: Dance: Toe
 - Clay: Potter: Pots**
 - Doctor: Injection: Pills
 - Cloth: Tailor: Clothes
 - Black board: Chalk: Teacher
 - Electricity: Bulb: Light

**9. Play: Win: Lose**

- Accident: Death: Survive
- Examination: Success: Determination
- Read: Book: Magazine
- Music: Dance: Art

10. Talk: Whisper: Shout

- Boredom: Tired ness: Rest
- Touch: Hold: Embrace
- See: Look: Watch
- Create: Look: Watch

Directions for 11-21: A good way to figure out the relationship in a given question is to make up a sentence that describes the relationship between the first two words. Then, try to use the same sentence to find out which of the answer choices completes the same relationship with the third word.

11. Odometer is to mileage as compass is to:

- Speed
- Hiking
- Needle
- Direction

12. Marathon is to race as hibernation is to:

- Winter
- Bear
- Dream
- Sleep

13. Window is to pane as book is to:

- Novel
- Glass
- Cover
- Page

14. Cup is to coffee as bowl is to:

- Dish
- Soup
- Spoon
- Food

15. Yard is to inch as quart is to:

- Gallon
- Ounce
- Milk
- Liquid

16. Elated is to despondent as enlightened is to:

- Aware
- Ignorant
- Miserable
- Tolerant

17. Optimist is to cheerful as pessimist is to:

- Gloomy
- Mean
- Petty
- Helpful

18. Reptile is to lizard as flower is to:

- Petal
- Stem
- Daisy
- Alligator

19. Play is to actor as concert is to:

- Symphony
- Musician
- Piano
- Percussion

20. Sponge is to porous as rubber is to:

- Massive
- Solid
- Elastic
- Inflexible

21. Careful is to cautious as boastful is to:

- Arrogant
- Humble
- Joyful
- Suspicious

3. If ACNE is coded as 3, 7, 29, 11 then BOIL will be coded as:

- 5, 31, 21, 25
- 5, 31, 19, 25
- 5, 29, 19, 25
- 5, 29, 19, 27

4. In a code language 'mu kay cit' means 'very lucky person' and 'dis hu mu' means 'fortunate and lucky'. Which is the word in that language for 'lucky'?

- mu
- kay
- cit
- dis

5. If PICTURE is coded as tuvxyz, then PATCH would be coded as:

- Wtzyv
- Twxyz
- Tqwvm
- Mtuvw

6. If in a certain language, MADRAS is coded as NBESBT. How is BOMBAY coded in that code?

- CPNCBZ
- CPNCBZ
- CPOCBZ
- CQOCBZ

7. In a certain code, TRIPPLE is written as SQHOOKD. How is DISPOSE written in that code?

- CHRONRD
- DSOESPI
- ESJTPTF
- ESOPSID

8. If in a code language, COULD is written as BNTKC and MARGIN is written as LZQFHM. How will MOULDING be written in that code?

- CHMFINTK
- LNKTCHMF
- LNTKCHMF
- NITKHCMF

9. In a certain code, MONKEY is written as XDJMNL. How is TIGER written in that code?

- QDFHS
- SDFHS
- SHFDQ
- UJHFS

10. In a certain code, COMPUTER is written as RFUVQNPC. How is MEDICINE written in the same code?

- EOJDJEFM
- EOJDEJFM
- MFEJDJOE
- MFEDJJOE

11. If VICTORY is coded as YLFWRUB, how can SUCCESS be coded?

- VXEEIVV
- VXFFHVV
- VYEEHVV
- VYEFIVV

12. In a certain code, TOGETHER is written as RQEGRJCT. In the same code, PAROLE will be written as:

- NCPQJG
- NCQPJG
- RCPQJK
- RCTQNC

13. If FRIEND is coded as HUMJTK, how is CANDLE written in that code?

- EDRIRL
- DCQHJK
- ESJFME
- FYOBOC

14. If in a certain language, COUNSEL is coded as BITIRAK, how is GUIDANCE written in that code?

- EOHYZKBB
- FOHYZJBB
- FPHZZKAB
- HOHYBJBA

15. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?

- 246173
- 214673
- 214763
- 216473

CODING-DECODING**1. In a certain code, RIPPLE is written as 613382 and LIFE is written as 8192. How is PILLER written in that code?**

- 318826
- 318286
- 618826
- 328816

2. In a certain code, GIGANTIC is written as GIGTANCI. How is MIRACLES written in that code?

- MIRLCAES
- MIRLACSE
- RIMCALSE
- RIMLCAES

DIRECTION SENTENCE TEST**1. If South-East becomes North, North-East becomes West and so on. What will West become?**

- North-East
- North-West
- South-East
- South-West





- A man walks 5 km towards south and then turns to the right. After walking 3 km he turns to the left and walks 5 km. Now, in which direction is he from the starting place?
 - West
 - South
 - North-East
 - South-West
- K is 40 m South-West of L. If M is 40 m South-East of L, then M is in which direction of K?
 - East
 - West
 - North-East
 - South
- A man walks 2 km towards North. Then, he turns to East and walks 10 km. After this he turns to North and walks 3 km. Again he turns towards East and walks 2 km. How far is he from the starting point?
 - 10 km
 - 13 km
 - 15 km
 - None of these
- The length and breadth of a room are 8 m and 6 m respectively. A cat runs along all the four walls and finally along a diagonal order to catch a rat. How much total distance is covered by the cat?
 - 10
 - 14
 - 38
 - 48
- One morning Udai and Vishal were talking to each other face to face at a crossing. If Vishal's shadow was exactly to the left of Udai, which direction was Udai facing?
 - East
 - West
 - North
 - South
- Y is in the East of X which is in the North of Z. If P is in the South of Z, then in which direction of Y, is P?
 - North
 - South
 - South-East
 - None of these
- If South-East becomes North, North-East becomes West and so on. What will West become?
 - North-East
 - North-West
 - South-East
 - South-West
- Rahul put his timepiece on the table in such a way that at 6 P.M. hour hand points to North. In which direction the minute hand will point at 9.15 P.M.?
 - South-East
 - South
 - North
 - West
- Rasik walked 20 m towards north. Then he turned right and walks 30 m. Then he turns right and walks 35 m. Then he turns left and walks 15 m. Finally, he turns left and walks 15 m. In which direction and how many meters is he from the starting position?
 - 15 m West
 - 30 m East
 - 30 m West
 - 45 m East
- The flats of which of the other pair than SU, is diagonally opposite to each other?
 - PT
 - QP
 - QR
 - TS
 - None of these
- If the flats of T and P are interchanged, whose flat will be next to that of U?
 - Q
 - T
 - P
 - R
 - None of these
- Which of the combination get south facing flats?
 - URP
 - UPT
 - QTS
 - Data inadequate
- To arrive at the answers to the above questions, which of the following statement can be dispensed with?
 - None
 - Only (i)
 - (ii) only
 - (iii) only
 - None of these

Directions for Q 6-8: These questions are based on the information given below:

Four ladies A, B, C and D and four Gentlemen E, F, G and H are sitting in a circle round the table facing each other.

- No two ladies or gentlemen are sitting side by side
- C, who is sitting between G and E, is facing D
- F is between D and A and is facing G
- H is to the right of B

6. Who is sitting to the left of A?

- E
- F
- G
- H

7. E is facing whom?

- Fb.
- B
- G
- H

8. Who are the immediate neighbours of B?

- G and H
- E and F
- E and H
- F and H

Directions for Q 9-13: These questions are based on the information given below:

- Eight persons E, F, G, H, I, J, K and L are seated around a square table -- two on each side.
- There are three lady members and they are not seated next to each other.
- J is between L and F.
- G is between I and F.
- H, a lady member, is second to the left of J.
- F, a member is second is seated opposite to E, a lady member.
- There is a lady member between F and I.

9. Who among the following is to the immediate left of F?

- G
- J
- H
- I

10. What is true about J and K?

- J is female, K is male
- J is male, K is female
- Both are female
- Both are male

11. How many persons are seated between K and F?

- 1
- 2
- 3
- 4

SITTING ARRANGEMENT

Directions for Q 1-5: Read the following information carefully and answer the questions that follow:

- Six flats on a floor in two rows facing north and south are allotted to P, Q, R, S, T and U
- Q gets a north facing flat and is not next to S
- S and U get diagonally opposite flats
- R next to U, gets a south facing flat and T gets a north facing flat

1. Whose flat is between Q and S?

- T
- U
- R
- P
- Data inadequate





NUMBER SYSTEM

1. **Natural numbers:** Counting numbers 1, 2, 3, 4, 5.....are known as natural numbers
2. **Whole numbers:** If we include 0 among the natural numbers, then the numbers 0, 1, 2, 3, 4, 5 etc. are called whole numbers
3. **Integers:** All counting numbers and their negatives including zero are known as integers. The set of integers are {...-3, -2, -1, 0, 1, 2, 3, 4.....}
 - Positive integers are the set {1, 2, 3, 4, 5.....} of all positive integers. Positive integers and natural numbers are synonyms.
 - Negative integers are the set of {-1, -2, -3, -4 ...} all negative integers. 0 is neither positive nor negative.
4. **Rational numbers:** The numbers of the form p/q , where p and q are integers and $q \neq 0$ are known as rational numbers, e.g., $2/3$, $5/3$, etc.
5. **Irrational numbers:** Those numbers which when expressed in decimal form are neither terminating nor repeating decimals are known as irrational numbers, e.g., $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$etc.
6. **Real numbers:** The rational and irrational numbers combined together are called real numbers, e.g., $11/21$, $\sqrt{5}$, $3 + \sqrt{5}$, etc.
7. **Prime numbers:** Number divisible by 1 and itself and not divisible by any other number is called prime number, e.g., 2, 3, 5, 7, 11, etc.
8. **Composite numbers:** Natural numbers greater than 1 which are not prime numbers, e.g., 4, 6, 9, etc.
9. **Co-prime numbers:** Two numbers which have only 1 as the common factors are called Co-primes or relatively prime to each others, e.g., (3, 7) (8, 9) (36, 35), etc.

TEST OF DIVISIBILITY

1. **Divisible by 2:** A number divisible by 2 if the unit digit is zero or divisible by 2, e.g., 22, 42, 84, 3872, etc.
2. **Divisible by 3:** A number is divisible by 3 if the sum of all digits in the number is divisible by 3, e.g., 2553 here $2 + 5 + 5 + 3 = 15$, which is divisible by 3. So 2553 is divisible by 3.
3. **Divisible by 4:** A number is divisible by 4, if the sum of its last 2 digits is divisible by 4, e.g., 5249376 is divisible by 4, since 76 is divisible by 4.
4. **Divisible by 5:** A number is divisible by 5 if its unit digit is 5 or 0, e.g., 50, 505, 328695 is divisible by 5.

5. **Divisible by 6:** A number is divisible by 6 if the number is even and sum of digits is divisible by 3, e.g., 4536 is an even number also sum of digits $4 + 5 + 3 + 6 = 18$ is divisible by 3.
6. **Divisible by 8:** A number is divisible by 8 only when the number formed by its last digits is divisible by 8, e.g., 5647472 here 472 is divisible by 8 hence, this number 5647472 is divisible by 8.
7. **Divisible by 9:** A number is divisible by 9 if the sum of its digit is divisible by 9. e.g., 594324 is divisible by 9, since the sum of its digits ($5 + 9 + 4 + 3 + 2 + 4$) is 27, which is divisible by 9.
8. **Divisible by 10:** A number is divisible by 10 if its unit digit is 0, e.g., 90, 900, 740, etc.
9. **A number is divisible by 11** if the difference of sum of digit at odd places and sum of digit at even places is either 0 or divisible by 11, e.g., 1331 is divisible by 11 since (sum of its digits at odd places $1 + 3$) - (sum of its digits at even places $3 + 1$) and their difference is $4 - 4$ is 0, so 1331 is divisible by 11.

LCM AND HCF

- **Least common multiple:** The lowest common multiple (LCM) of two whole numbers is the smallest whole number which is a multiple of both.
Example: Consider the numbers 12 and 15 again:
The multiples of 12 are: 12, 24, 36, 48, 60, 72, 84,
The multiples of 15 are: 15, 30, 45, 60, 75, 90,....
60 is a common multiple (a multiple of both 12 and 15), and there are no lower common multiples.
Therefore, the lowest common multiple of 12 and 15 is 60.
- **Highest Common Factor:** The highest common factor (HCF) of two whole numbers is the largest whole number which is a factor of both.
Example: Consider the numbers 12 and 15:
The factors of 12 are: 1, 2, 3, 4, 6, 12.
The factors of 15 are: 1, 3, 5, and 15.
1 and 3 are the only common factors (numbers which are factors of both 12 and 15).
Therefore, the highest common factor of 12 and 15 is 3.

HCF AND LCM OF FRACTIONS

- HCF of fraction = HCF of numerators/LCM of denominators
- LCM of fraction = LCM of numerators/HCF of denominators



SIMPLIFICATION

Remember the word, "BODMAS"

- **B**- Bracket first
- **O**- Orders (i.e., Powers and square roots, etc.)
- **D**- Then Division
- **M**- Multiplication, after that
- **A**- Addition and last
- **S**- Subtraction

Common Algebraic Formulae

- $(a + b)^2 = a^2 + 2ab + b^2$
- $a^2 + b^2 = (a + b)^2 - 2ab$
- $(a - b)^2 = a^2 - 2ab + b^2$
- $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$
- $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
- $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$
- $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$
- $a^3 - b^3 = (a - b)^3 + 3ab(a - b)$
- $a^2 - b^2 = (a + b)(a - b)$
- $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
- $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

PERCENTAGE

In mathematics, a percentage is a number or ratio as a fraction of 100. It is often denoted using the percent sign, "%"

$$\text{Percentage} = \frac{\text{Value obtained}}{\text{Total value}} \times 100$$

AVERAGE

The average or arithmetic mean is defined as the mean value which is equal to the ratio of sum of number of a given set of values to the total number of values present in the set.

Some Important Points

- Average of first 10 natural number is 5.5.
- Average of first 10 whole numbers is 4.5.
- Average of first 10 even number is 11.
- Average of first 10 odd numbers is 10.

PROFIT AND LOSS

Important Formulae

- **Cost price:** The price, at which an article is purchased, is called its cost price, abbreviated as CP
- **Selling price:** The price, at which an article is sold, is called its selling price, abbreviated as SP
- **Profit or gain:** If SP is greater than CP, the seller is said to have a profit or gain.
- **Loss:** If SP is less than CP, the seller is said to have incurred a loss.
- Gain = (SP) - (CP)
- Loss = (CP) - (SP)

- Loss or gain is always reckoned on CP

Gain Percentage: (Gain %)

$$\text{Gain\%} = \left(\frac{\text{Gain} \times 100}{\text{CP}} \right)$$

Loss Percentage: (Loss %)

$$\text{Loss\%} = \left(\frac{\text{Loss} \times 100}{\text{CP}} \right)$$

Selling price: (S.P.)

$$\text{S.P.} = \left[\frac{(100 + \text{Gain\%})}{100} \times \text{C.P.} \right]$$

Cost price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 + \text{Gain\%})} \times \text{S.P.} \right]$$

Selling price: (S.P.)

$$\text{S.P.} = \left[\frac{(100 - \text{Loss\%})}{100} \times \text{C.P.} \right]$$

Cost price: (C.P.)

$$\text{C.P.} = \left[\frac{100}{(100 - \text{Loss\%})} \times \text{S.P.} \right]$$

Solved Examples

1. Rohan sold a Table at the cost of ₹1950 at a loss of 25%. At what cost will he have to sell it to get a profit of 30%?

Answer:

Case I. S.P. = 1950, Loss = 25%.

$$\therefore \text{C.P.} = ₹ \left(\frac{100}{75} \times 1950 \right) = ₹2600.$$

Case II. C.P. = ₹2600, Profit = 30%.

$$\therefore \text{S.P.} = ₹ \left(\frac{130}{100} \times 2600 \right) = ₹3380.$$

2. A manufacturer makes 800 articles at a cost of ₹1.50 per article. He fixes the selling price such that if only 600 articles are sold, he would make a profit of 30% on his outlay. However, he sold 620 articles at this price. Find his actual profit percent of the total outlay, assuming that the unsold articles are useless.

Answer:

C.P. of 800 articles = ₹(1.50 × 800) = ₹1200.

$$\text{S.P. of 600 articles} = ₹ \left(\frac{130}{100} \times 1200 \right) = ₹1560$$

$$\text{S.P. of 620 articles} = ₹ \left(\frac{1560}{600} \times 620 \right) = ₹1612$$

Profit = ₹(1612 - 1200) = ₹412.

$$\therefore \text{Profit \%} = ₹ \left(\frac{412}{1200} \times 100 \right) \% = 34\frac{1}{3}\%$$

3. A seller by selling 33 meters of cloth, gains the selling price of 11 meters. Find the gain percent.

Answer:

SP of 33 m - CP of 33 m = Gain = S.P. of 11 m.

$$\therefore \text{S.P. of 22 m} = \text{C.P. of 33 m.}$$

Let CP of each metre be ₹1. Then, C.P. of 22 m = ₹22, SP of 22 m = ₹33.

$$\therefore \text{Gain \%} = \left(\frac{11}{22} \times 100 \right) \% = 50\%$$





4. A seller advertises for selling cloth at 4% loss. However, by using a false metre scale he actually gains 25%. what is the actual length of the scale?

Answer:

Let CP of 1 m of cloth be ₹1.

Confirmed SP of 1 m cloth = ₹ $\left(\frac{96}{100}\right)$ = ₹0.96. Gain = 25%.

Actual C.P. of the cloth sold for ₹0.96 = $\left(\frac{100}{125} \times 0.96\right)$ = ₹0.768.

Actual length of the scale = Length bought for ₹0.768 = 76.8 cm.

SIMPLE AND COMPOUND INTEREST

Important Formulae

Simple Interest

- I. Principal:** The money borrowed or lent out for a certain period is called the *principal* or the *sum*.
- II. Interest:** Extra money paid for using other's money is called interest.
- III. Simple Interest (S.I.):** If the interest on a sum borrowed for a certain period is reckoned uniformly, then it is called *simple interest*.
- Suppose Principal = P , Rate = $R\%$ per annum (p.a.) and Time = T years.

Then, (i) $S.I. = \left(\frac{P \times R \times T}{100}\right)$

(ii) $P = \left(\frac{100 \times S.I.}{R \times T}\right)$; $R = \left(\frac{100 \times S.I.}{P \times T}\right)$; $T = \left(\frac{100 \times S.I.}{P \times R}\right)$.

Compound Interest

Compound Interest: The interest of the previous year is added to the principal for the calculation of the compound interest.

Let Principal = P , Rate = $R\%$ per annum, Time = n years.

Interest is compounded Annually:

$$\text{Amount} = p \left(1 + \frac{R}{100}\right)^n$$

Interest is compounded Half-yearly:

$$\text{Amount} = p \left[1 + \frac{(R/2)}{100}\right]^{2n}$$

Interest is compounded Quarterly:

$$\text{Amount} = p \left[1 + \frac{(R/4)}{100}\right]^{4n}$$

When rates are vary for different years, i.e., $R_1\%$, $R_2\%$, $R_3\%$ for 1st, 2nd and 3rd year respectively.

$$\text{Then, Amount} = P \left(1 + \frac{R_1}{100}\right) \left(1 + \frac{R_2}{100}\right) \left(1 + \frac{R_3}{100}\right)$$

Solved Examples

1. Rohan borrowed some money at the rate of 6% p.a. for the first 2 years, at the rate of 9% p.a. for the next 3 years, and at the rate of 14% p.a. for the period beyond 5 years. If he pays a total interest of ₹11400 at the end of nine years, how much money did he borrow?

Answer:

Let the sum borrowed be x . Then,

$$\left(\frac{x \times 6 \times 2}{100}\right) + \left(\frac{x \times 9 \times 3}{100}\right) + \left(\frac{x \times 14 \times 4}{100}\right) = 11400$$

$$\Rightarrow \left(\frac{3x}{25} + \frac{27x}{100} + \frac{14x}{25}\right) = 11400 \Rightarrow \frac{95x}{100} = 11400$$

$$\Rightarrow x = \left(\frac{11400 \times 100}{95}\right) = 12000.$$

Hence, sum borrowed = ₹12,000.

2. A certain sum of money becomes three times of itself in 20 years at simple interest. In how many years does it become double of itself at the same rate of simple interest?

Answer:

Let Principal = P . Then, S.I. = $2P$ and $T = 20$ years.

$$\therefore \text{Rate} = \left(\frac{100 \times 2P}{P \times 20}\right) \% = 10\%$$

Now, principal = P , S.I. = P , $R = 10\%$

$$\therefore \text{Time} = \left(\frac{100 \times P}{P \times 10}\right) \text{ years} = 10 \text{ years}$$

3. At what rate of simple interest a certain sum will be doubled in 20 years?

Answer:

$$A = P + SI$$

$$2P = P + SI \quad \text{So} \quad SI = P$$

$$SI = \frac{PRT}{100}$$

$$\Rightarrow P = \frac{P \times R \times 20}{100} \quad \Rightarrow R = \frac{100}{20} = 5\%$$

4. A sum was put at simple interest at a certain rate for 5 years. Had it been put at 2% higher rate, it would have fetched ₹360 more. Find the sum.

Answer:

Let sum = P and original rate = R . Then,

$$\left[\frac{P \times (R+2) \times 5}{100}\right] - \left[\frac{P \times R \times 5}{100}\right] = 360$$

$$\Rightarrow 5PR + 10P - 5PR = 3600 \quad \Rightarrow 10P = 3600 \quad \Rightarrow P = 3600.$$

Hence, sum = ₹3600.

5. Find the compound interest on ₹20,000 in 2 years at 4% per annum, the interest being compounded half-yearly.

Answer:

Principal = ₹20000; Rate = 2% per half-year; Time = 2 years = 4 half-years.

$$\therefore \text{Amount} = ₹ \left[20000 \times \left(1 + \frac{2}{100}\right)^4\right]$$

$$= ₹ \left(20000 \times \frac{51}{50} \times \frac{51}{50} \times \frac{51}{50} \times \frac{51}{50}\right) = ₹21648.64.$$

$$\therefore \text{C.I.} = ₹(21648.64 - 20000) = ₹1648.64.$$

6. In how many years ₹100000 will become ₹1,33,100 at compound interest rate of 10% per annum?

Answer:

Principal = ₹100000, Amount

= ₹133100, Rate = 10% p.a.

Let the time be n years. Then,

$$100000 \left(1 + \frac{10}{100}\right)^n = 133100 \quad \Rightarrow \left(\frac{11}{10}\right)^n = \left(\frac{1331}{1000}\right) = \left(\frac{11}{10}\right)^3$$





$$\Rightarrow n = 3.$$

Hence, required time = 3 years.

7. Find the sum of money which will amount to ₹26000 in 6 months at the rate of 8% per annum when the interest is compounded quarterly.

Answer:

Amount = ₹26000; Time = 6 months = 2 quarters

Rate = 8% p.a. = 2% per quarter.

Let the sum be ₹x. Then,

$$x \times \left(1 + \frac{2}{100}\right)^2 = 26000 \Rightarrow \left(x \times \frac{51}{50} \times \frac{51}{50}\right) = 26000$$

$$\Rightarrow x = \left(\frac{26000 \times 10 \times 50 \times 50}{51 \times 51}\right) = 249,903.88.$$

Hence, required sum = ₹249903.88.

8. The compound interest accrued on an amount of ₹22000 at the end of two years is ₹5596.80. What would be the simple interest accrued on the same amount at the same rate in the same period?

Answer:

Let the rate be R% p.a. Then,

$$22000 \left(1 + \frac{R}{100}\right)^2 = (22000 + 5596.80) = 27596.80$$

$$\Rightarrow \left(1 + \frac{R}{100}\right)^2 = \frac{275968}{220000} = \left(\frac{28}{25}\right)^2$$

$$\Rightarrow \left(1 + \frac{R}{100}\right) = \frac{28}{25} \Rightarrow \frac{R}{100} = \frac{3}{25} \Rightarrow R = 12.$$

$$\therefore \text{S.I.} = ₹ \left(\frac{22000 \times 12 \times 2}{100}\right) = ₹5280.$$

TIME AND WORK

Important Formulae

1. Work from Days:

If a person can do a piece of work in n days, then in 1 day work = $\frac{1}{n}$

2. Days from work:

If person's 1 day's work = $\frac{1}{n}$, then A can finish the work in n days.

3. Ratio:

- If A is thrice as good a workman as B, then:

Ratio of work done by A and B = 3:1

Ratio of times taken by A and B to finish a work = 1:3.

Solved Examples

1. Manohar alone can complete a piece of work of ₹300 in 6 days; but by engaging an assistant, the work is completed in 4 days. Find the share to be received by the assistant.

Answer:

$$\text{Assistant's 1 day's work} = \frac{1}{4} - \frac{1}{6} = \frac{1}{12}.$$

\therefore Manohar's share : Assistant's share = Ratio of their 1 day's work

$$= \frac{1}{6} : \frac{1}{12} = 2 : 1.$$

$$\text{Hence, assistant's share} = ₹ \left(300 \times \frac{1}{3}\right) = ₹100.$$

2. Salone can do a piece of work in 7 days of 9 hours each and Rachel can do it in 6 days of 7 hours each. How long will they take to do it, working together $8\frac{2}{5}$ hours a day?

Answer:

A can complete the work in $(7 \times 9) = 63$ hours.

B can complete the work in $(6 \times 7) = 42$ hours.

$$\therefore \text{A's 1 hour's work} = \frac{1}{63} \text{ and B's 1 hour's work} = \frac{1}{42}$$

$$(\text{A} + \text{B})\text{'s 1 hour's work} = \left(\frac{1}{63} + \frac{1}{42}\right) = \frac{5}{126}.$$

$$\therefore \text{Both will finish the work in} \left(\frac{126}{5}\right) \text{ hrs.}$$

$$\text{Number of days of } 8\frac{2}{5} \text{ hrs each} = \left(\frac{126}{5} \times \frac{5}{42}\right) = 3 \text{ days.}$$

3. Vikram takes twice as much time as Raju and thrice as much time as Arun to complete a job. If working together, they can complete the job in 4 days, find time taken by each of them separately to complete the work.

Answer:

Suppose Vikram takes x hours to complete the job.

Then, Raju takes $\frac{x}{2}$ hours and Arun takes $\frac{x}{3}$ hours to do the job.

Vikram's 1 hour's work = $\frac{1}{x}$; Raju's 1 hour's work = $\frac{2}{x}$; Arun's 1 hour's work = $\frac{3}{x}$.

$$\therefore 4 \left(\frac{1}{x} + \frac{2}{x} + \frac{3}{x}\right) = 1 \Rightarrow \frac{6}{x} = \frac{1}{4} \Rightarrow x = 24.$$

Hence, Vikram takes 24 hours, Raju takes 12 hours and Arun takes 8 hours to complete the job.

4. A can do a certain job in 12 days. B is 60% more efficient than A. How many days does B alone take to do the same job?

Answer:

Ratio of times taken by A and B = 160 : 100 = 8 : 5

Suppose B alone takes x days to do the job.

$$\text{Then, } 8 : 5 :: 12 : x \Rightarrow 8x = 5 \times 12 \Rightarrow x = 7\frac{1}{2} \text{ days.}$$

TIME AND DISTANCE

Important Formulae

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}, \text{ Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\text{Distance} = (\text{Speed} \times \text{Time})$$

Conversion of km/hr to where x is any m/s value:

$$x \text{ km/hr} = \left(x \times \frac{5}{18}\right) \text{ m/sec.}$$

Conversion of m/sec to km/hr:

$$x \text{ m/sec} = \left(x \times \frac{18}{5}\right) \text{ km/hr; where } x \text{ is any value } v_1$$

Average Velocity: Suppose a man covers a certain distance at v_1 km/h and an equal distance at v_2 km/h. Then, the average speed during the





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