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Maharashtra
Drug Inspector एकच ध्येय -

३० दिवसांची द्रुत तयारी

Crack MAHARASHTRA DRUG INSPECTOR

in

30 DAYS



Theory + Objective
Book



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MPSC SYLLABUS

Specially Designed
for the student of

MAHARASHTRA

Crack
MAHARASHTRA DRUG INSPECTOR

in
30 DAYS

Theory + Objective
Book

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Maharashtra Drug Inspector Recruitment

क्रमांक: एमडीआर-१३२५/प्र.क्र.२१/२०२५/जाहिरात

जाहिरात क्रमांक : ११६/२०२५

महाराष्ट्र शासनाच्या वैद्यकीय शिक्षण व औषधी द्रव्ये विभागाकडून प्राप्त मागणीपत्रानुसार वैद्यकीय शिक्षण व औषधी द्रव्ये विभागाच्या अधिपत्याखालील आयुक्त, अन्न व औषध प्रशासन, महाराष्ट्र राज्य, मुंबई यांच्या कार्यालयातील **औषध निरीक्षक, गट-ब, अन्न व औषध प्रशासन** संवर्गातील **एकूण १०९** पदांच्या भरतीकरीता विहित ऑनलाईन पध्दतीने अर्ज मागविण्यात येत आहेत.

२. उपलब्ध पदसंख्या:- १०९

३. भरावयाच्या पदांचा सामाजिक/समांतर आरक्षणाबाबतचा तपशील खालीलप्रमाणे आहे:-

प्रवर्ग	अ.जा.	अ.ज.	वि.जा. (अ)	भ.ज. (ब)	भ.ज. (क)	भ.ज. (ड)	वि.मा.प्र.	सा.आणि शं. मागासवर्ग	आ.दु.घ.	इ.मा.व.	एकूण आरक्षित	अराखीव (खुला)	एकूण पदे
एकूण पदे	१६	१२	--	०२	०७	०२	०१	११	११	१४	७६	३३	१०९
सर्वसाधारण	१०	०७	--	०१	०५	०१	०१	०७	०७	०९	४८	२१	६९
महिला	०५	०४	--	०१	०२	०१	--	०३	०३	०४	२३	१०	३३
खेळाडू	०१	०१	--	--	--	--	--	०१	०१	०१	०५	०२	७
अनाथ	एकूण ०१ पद अनाथ संस्थात्मक प्रवर्गासाठी राखीव.												
दिव्यांग	एकूण ०४ पदे आरक्षित - (१) अंध / अल्पदृष्टी-०१ पद (२) कर्णबधीरता अथवा ऐकू येण्यातील दुर्बलता - ०१ पद (३) अस्थीव्यंगता/ मेंदुचा पक्षाघात/कुष्ठारोगमुक्त/ शारीरिक वाढ खुंटणे/आम्ल हल्लाग्रस्त - ०१ पद (४) विशिष्ट शिक्षण कमतरता/ मानसिक आजार तसेच बहिरेपणा व अंधत्वासह एकापेक्षा जास्त प्रकारचे दिव्यांगत्व-०१ पद.												

४. प्रस्तुत जाहिरातीतमध्ये विहित केलेल्या अटी व शर्तीची पूर्तता करणार्या उमेदवारांकडून आयोगाच्या ऑनलाईन अर्ज प्रणालीद्वारे अर्ज मागविण्यात येत आहेत.

This book has been prepared strictly according to the
Maharashtra Drug Assistant Commissioner (Drug) – 2022 syllabus.
In case of syllabus changes (2022 or future updates), the additional content will be
provided only in eBook format inside the GDC Classes App.

Syllabus

MAHARASHTRA DRUG INSPECTOR RECRUITMENT EXAM SYLLABUS

अनु. क्र.	घटक व उपघटक
1	Physiology, Pathophysiology, Pharmacology and Toxicology:
1.1	Physiology - i) Composition/ function of Blood elements, ii) Coagulation of blood, iii) Blood groups, iv) Blood components, manufacturing, v) Whole human blood (I.P.),vi) Blood bank-operation / requirements.
1.2	Pathophysiology - STD, AIDS, Hypersensitivity, HBSAg.
1.3	Pharmacology - Factors modifying drug action, Drugs affecting coagulation. Antihypertensive drugs, Antipyretic, Analgesic, Antitussive, Sedative, Hypnotics, Opioids, NSAIDS, Local Anaesthetics, Chemotherapeutic Agents including Anticancer drugs, Antifungal Agents, Drugs affecting CNS, Antidiabetic drugs, Contraceptive drugs, Hormones, Drugs acting on uterus.
1.4	Toxicology - Classification of poison, chelating agent, heavy metals, antidotes.

2	Microbiology: Sterilisation procedure, Aseptic technics, disinfections, pyrogens, LAL Test, Assay of antibiotics/vitamins, biochemical serological, virological technics, BOD, different media, microbial drugs, drug resistance, microbial limit test, pathogenic organism of common occurrence.
3	Biochemistry & Chemistry of drugs / Pharmaceuticals: 3.1 DNA, RNA, Nucleic Acid & components, enzymes, metabolism of protein, carbohydrate, lipids, recombinant technology and its application, immunological product-vaccine, sera. 3.2 Isomers, Tautomers, fermentation, synthesis of antibiotics, diazo reaction, chemistry of steroids 3.3 Dosage forms, sustained release, dosage form, enteric coating, new drugs, parental drugs, Good manufacturing practices, Good laboratory practices, Routes of administration, Preservatives, suspending / emulsifying agents. Types of vehicles / types of waters, storage conditions for pharmaceuticals. 3.4 Principal and application of analysis, UV spectra / I.R./HPLC /GLC / Atomic absorption, HPTLC, LCMS, limit test, heavy metals, devices, sutures. 3.5 Surgical - Medical devices sutures 3.6 Law -DCC, DTAB, Misbranded, standard, spurious, adulterated drugs definitions, Government Analyst duties, Inspector - power / procedure, definition schedule M/Y/ U
4	General Knowledge related to Pharmaceuticals / Medicine field: 1) National Health Programme, 2) DPCO / NPPA, 3) Narcotic Drugs, 4) Poisons - Antidotes, 5) Essential Drugs, 6) Central Drug Authority 7) Nutraceuticals 8) Magic remedies - Act and Rules, 9) Import of Drugs and Cosmetics, 10) Central Drug Laboratory, 11) WHO - GMP - entification, 12) Current events. 13) Consumer Protection Act, 14) Right to Information Act.
5	Intelligence Test: Questions will be asked to test how far candidates can think quickly and accurately.



Preface

Crack “Maharashtra Drug Inspector Exam in 30 Days” is a focused, result-oriented, and strategically designed study guide for aspirants who aim to secure a prestigious position in the healthcare system through the Maharashtra Public Service Commission (MPSC) Examination. Considering the highly competitive nature of this exam and the limited time students often have for preparation, this book presents a systematic 30-day plan to help you prepare with clarity, discipline, and confidence.

The content has been carefully curated to **cover all essential areas of pharmaceutical sciences and allied subjects, including:**

- Physiology & Pathophysiology
- Pharmacology & Toxicology
- Microbiology & Biochemistry
- Chemistry of Drugs & Pharmaceuticals
- Pharmaceutics & Hospital Pharmacy
- Pharmaceutical Analysis & Jurisprudence
- General Knowledge (related to Pharmacy & Medicine)
- Intelligence Test

Highlights of the 30-Day Plan

- ✓ Daily preparation targets with concise, exam-focused theory
- ✓ MCQs with detailed explanations for deeper conceptual clarity
- ✓ Practice exercises, mini-tests, and full-length mock tests for effective self-evaluation
- ✓ Phygital learning : Concise theory notes with online Mock Tests, *Singham Series*, and Previous Years Solved Papers with explanations

This book is not merely a guide but a strategic companion—designed to help you revise smartly, build confidence, and maximize performance within a limited timeframe. Every chapter has been structured to save your time, sharpen your concepts, and prepare you to face the exam with a winning mindset.

We truly believe that if you follow this plan with sincerity and dedication, success will not be far away. May this book be your stepping stone toward a rewarding career as a Drug Inspector and your contribution to strengthening the healthcare system of Maharashtra.

“यश काही निवडक लोकांसाठी नसते, ते त्यांच्यासाठी असते जे त्यासाठी कठोर परिश्रम करतात।”
“Success is not for the chosen few, it is for those who choose to work hard for it.”



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PHYSIOLOGY

(Blood : Physiology, Composition / function of Blood elements, Coagulation of blood , Blood groups, Blood components, manufacturing, Whole human blood (I.P.), Blood bank- operation/ requirements)

INTRODUCTION

- Blood is a fluid connective tissue. It is considered as the 'fluid of life' because it carries lungs to all parts of the body and carbon dioxide from all parts of the body to the lungs.



Properties of Blood

Shortcut se sikhe...

SPECIFIC GRAVITY

Specific gravity total blood	1.052 to 1.061
Specific gravity blood cells	1.092 to 1.101
Specific gravity plasma	1.022 to 1.026

VOLUME

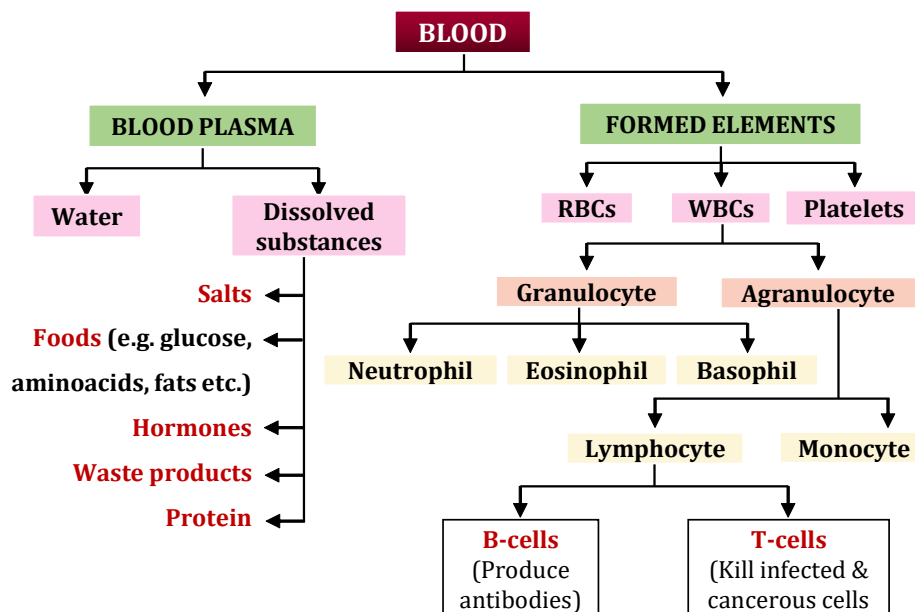
Adult male	About 5 L
Adult females	About 4.5 L
In newborn baby	About 450 mL
At puberty	About 5 L

COLOR

Arterial blood	Scarlet red because of more oxygen content
Venous blood	Venous blood is purple red because of more carbon dioxide content.

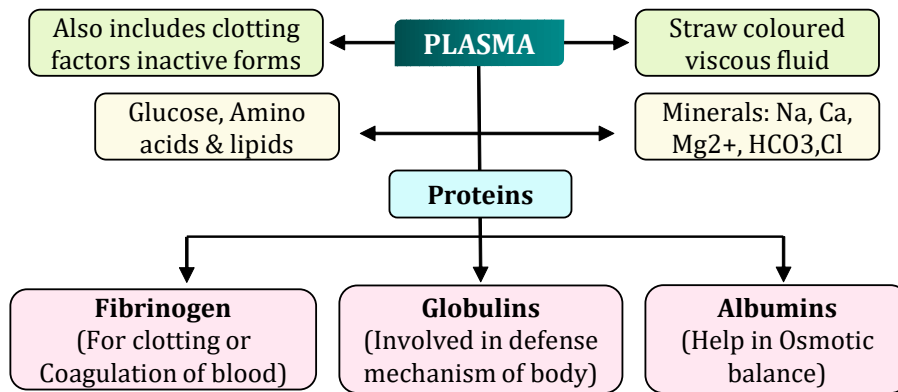
COMPOSITION AND FUNCTIONS OF BLOOD ELEMENTS [MPSC DI - 2012]

- Blood is made up of 55% plasma and 45% formed elements: red blood cells, white blood cells, and platelets. [MPSC DI - 2012]

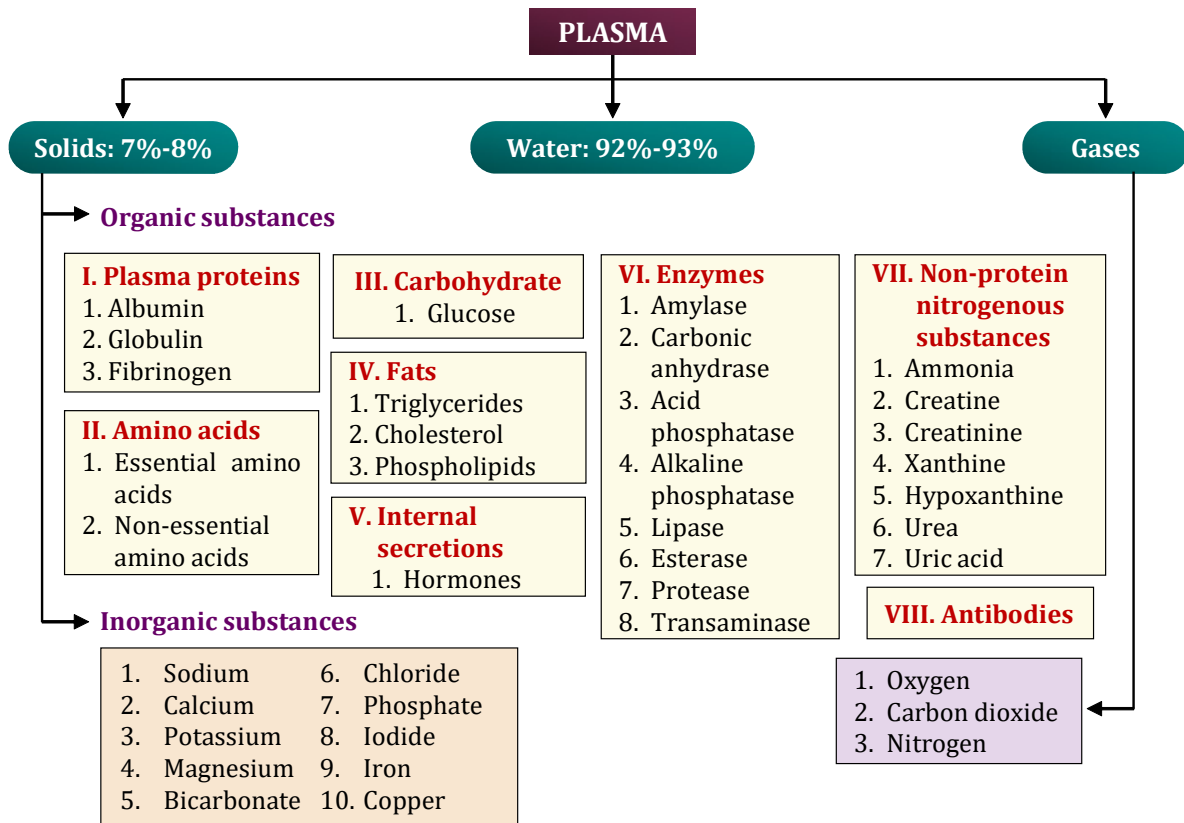


1. Blood Plasma

- It is straw coloured viscous matrix in which blood cells and platelets are suspended. It is slightly alkaline (pH-7.4), if 91-92% Water.
- The composition of plasma is 91-92% water, 6-8% plasma proteins.



Shortcut se sikhe...





Solve

DAY WISE MCQs

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DAY 1 TEST

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❖ Substances in Blood Plasma

CONSTITUENT	DESCRIPTION	FUNCTION
Water (91.5%)	Liquid portion of blood.	Solvent and suspending medium. Absorbs, transports, and releases heat.
Plasma proteins (7%) [MPSC ASSISTANT DRUG COMMISSIONER - 2023]	Most produced by liver.	Responsible for colloid osmotic pressure. Major contributors to blood viscosity. Transport hormones (steroid), fatty acids, and calcium. Help regulate blood pH.
a) Albumins [MPSC DI - 2008]	<ul style="list-style-type: none"> Smallest and most numerous plasma proteins. 54% of plasma proteins 	<p>Help maintain osmotic pressure, an important factor in the exchange of fluids across blood capillary walls.</p> <p>The major carrier protein for acidic drugs in the bloodstream.</p> <p>[MPSC ASSISTANT DRUG COMMISSIONER - 2023]</p>
b) Globulins	<ul style="list-style-type: none"> Large proteins (plasma cells produce immunoglobulins) 38% of plasma proteins. 	Immunoglobulins help attack viruses and bacteria. Alpha and beta globulins transport iron, lipids, and fat-soluble vitamins.
c) Fibrinogen	Large protein (7%).	Plays essential role in blood clotting.
Other solutes (1.5%)		
Waste products	Urea, uric acid, creatine, creatinine, bilirubin, ammonia.	Most are breakdown products of protein metabolism that are carried by the blood to organs of excretion.
Electrolytes	Inorganic salts; positively charged (cations) Na^+ , K^+ , Ca^{2+} , Mg^{2+} ; negatively charged (anions) Cl^- , HPO_4^{2-} , SO_4^{2-} , HCO_3^- .	Help maintain osmotic pressure and play essential roles in cell functions.
Nutrients	Products of digestion, such as amino acids, glucose, fatty acids, glycerol, vitamins, and minerals.	Essential roles in cell functions, growth, and development.
Gases	Oxygen (O_2)	Important in many cellular functions.
	Carbon dioxide (CO_2)	Involved in the regulation of blood pH.
	Nitrogen (N_2)	No known function.
Regulatory substances	Enzymes	Catalyze chemical reactions.
	Hormones	Regulate metabolism, growth, and development.
	Vitamins	Cofactors for enzymatic reactions.

2. Formed Elements: [MPSC DI-2012]

The formed elements of the blood include three principal components:

- Erythrocytes (red cells)**
- Leukocytes (white cells)**
- Platelets (thrombocytes)**

a. Red Blood Cell or Erythrocytes:

- Red blood cells (RBCs) are the non-nucleated formed elements in the blood.
- Erythro** is derived from Greek word erythros meaning red.
- Red color of RBCs is due to its coloring pigment, **hemoglobin**.



Day 2

PATHOPHYSIOLOGY

[STD, AIDS, Hypersensitivity, HBsAg (Hepatitis-B surface antigen)]

SEXUALLY TRANSMITTED DISEASE (STD)

❑ SEXUALLY TRANSMITTED DISEASE

❖ Introduction

- Sexually transmitted diseases (STD), also referred to as **sexually transmitted infections (STI)** and **venereal diseases (VD)**, are illnesses that have a significant probability of **transmission between humans by means of sexual behaviour, including vaginal intercourse, anal sex and oral sex.**
- They infect sexual and reproductive organs.

❖ **Symptoms** - Blood in urine, Burning sensation when urinating, Rashes, Itching.

❖ Most common STDs

- Bacterial:** Chancroid, Gonorrhoea and Syphilis
- Viral:** Genital herpes, Genital warts, and HIV/AIDS
- Parasites:** Trichomoniasis

❖ Different types of STDs and their causative agents

S. NO.	DISEASES	MICROORGANISMS	CATEGORY OF MICROORGANISMS
1.	Syphilis	<i>Treponema pallidum</i>	Spirochete (bacteria)
2.	Gonorrhoea	<i>Neisseria gonorrhoeae</i>	Gram negative, diplococcus bacteria
3.	Chancroid	<i>Haemophilus ducreyi</i>	Gram negative streptobacillus bacteria
4.	Genital Herpes	Herpes Simplex Virus (HSV) type 1 and 2	Virus
5.	Genital Warts	Human Papillomavirus (HPV)	Virus
6.	AIDS	Human Immunodeficiency Virus (HIV)	Virus
7.	Trichomoniasis	<i>Trichomonas vaginalis</i>	Parasite
8.	Chlamydia Infection	<i>Chlamydia trachomatis</i>	An obligate intracellular parasite

❑ SYPHILIS

❖ Introduction

- Caused by the spirochete *Treponema pallidum*.
- 3rd most common STD.
- Syphilis is sometimes called “the great imitator.”



FACTORS MODIFYING DRUG ACTION

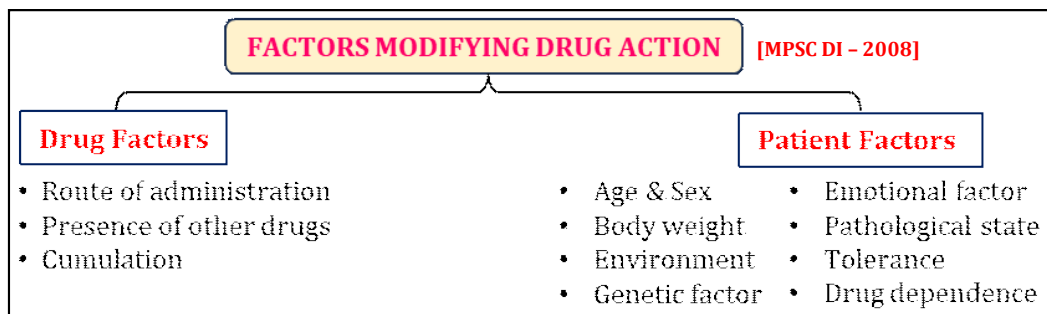
❑ INTRODUCTION

Variation in **response to the same dose** of a drug between **different patients** and even in the **same patient** on different occasions is a rule rather than exception.

❖ Variations in drug response due to many reasons:

1. Difference in pharmacokinetic handling of drugs – variability in plasma concentration
2. Receptor number or state difference
3. Other host and environment factors

There are a number of factors that can influence drug response. Individuals may often show **quantitative variations** in drug response, but rarely show qualitative variations.

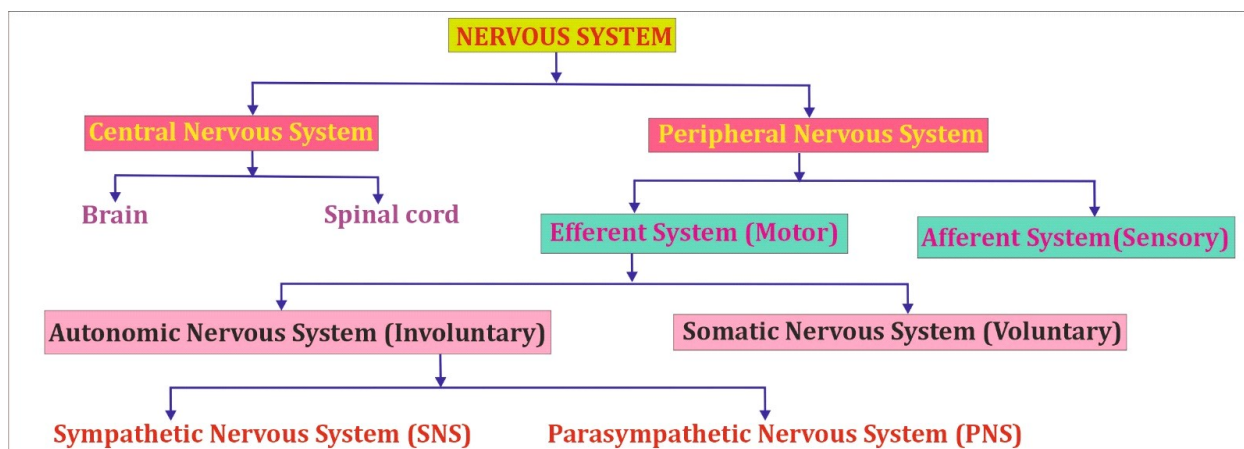


❖ Drug Factors

Route of administration	<ul style="list-style-type: none"> • When a drug is administered by different routes, it commonly exhibits quantitative variations; but sometimes it may also result in qualitative variations in response. (a) Quantitative variation: Oral dose of the drugs is usually larger than intravenous dose (since i.v. route produces 100% bioavailability) for example intravenous dose of morphine is 5-10 mg, whereas oral dose is 30-60 mg for analgesic effect. (b) Qualitative variation: The drug may produce an entirely different response when administered by different routes. For example, magnesium sulphate orally produces purgative effect; parenterally it causes CNS depression and locally reduces oedema in the inflamed area.
Presence of other drugs	Addition, potentiation, synergism and antagonism.
Cumulation	<ul style="list-style-type: none"> • When the elimination of a drug is slower than the rate of administration, the drug may accumulate in the body causing cumulative toxicity. • Example: Digoxin, Emetine, Chloroquine, etc.

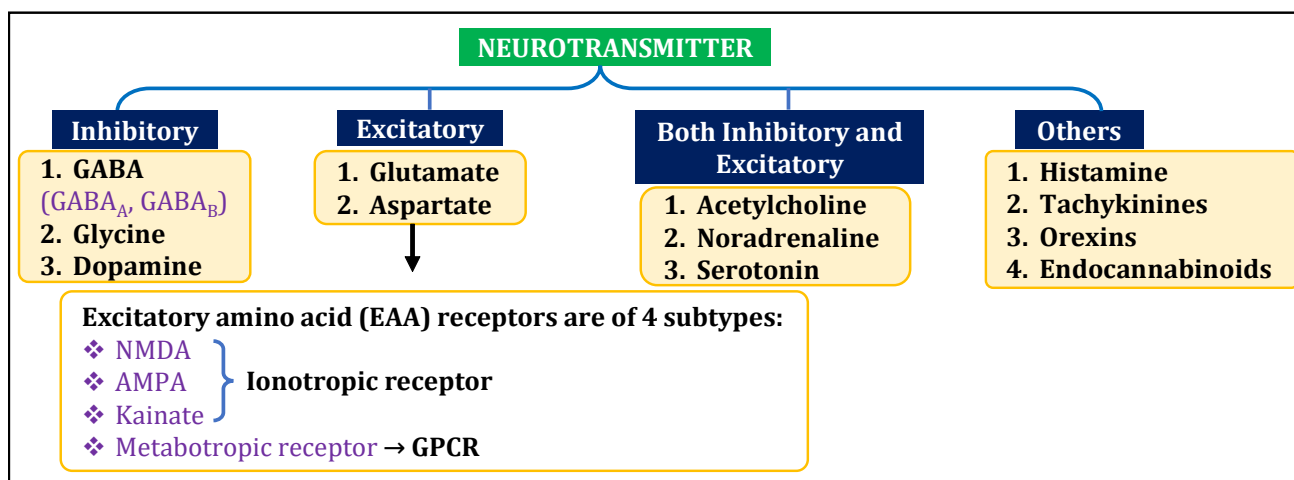
INTRODUCTION OF NERVOUS SYSTEM

- The **nervous system** is the highly complex part of an animal that coordinates its actions and sensory information by transmitting signals to and from different parts of its body.
- The nervous system is divided into **two** anatomical divisions:



CLASSIFICATION OF NEUROTRANSMITTERS

A. Classification of Neurotransmitter on the basis of action



B. Classification of Neurotransmitter on the basis of chemical nature

NEUROTRANSMITTER	CHEMICAL NATURE
GABA, Glycine, Glutamate, Aspartate	Amino acids
Norepinephrine, Epinephrine, Dopamine, Serotonin	Amines
Endorphin, Somatostatin, Bradykinin	Peptides
Acetylcholine	Esters

Day 5

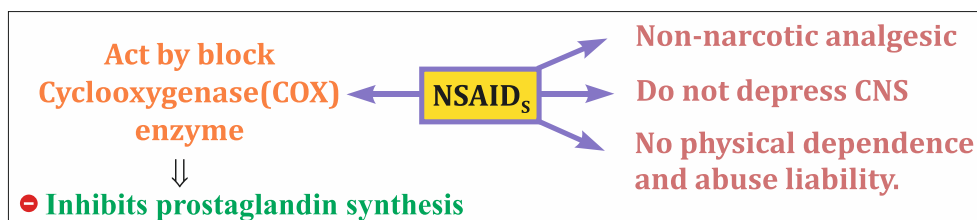
PHARMACOLOGY-III

(Nonsteroidal anti-inflammatory drugs, Antipyretic, Analgesic, Antitussive, Antihypertensive drugs and Local anesthetics)

NONSTEROIDAL ANTI-INFLAMMATORY DRUGS, ANTI-PYRETIC AND ANALGESICS

INTRODUCTION

- **Antipyretics** are drugs that **lower raised body temperature** in fever without affecting normal body temperature.
- **Analgesics** are agents that **relieve pain** selectively without affecting consciousness or other sensations.
- **Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)** are non-narcotic or non-opioid aspirin like analgesics having antipyretic and anti-inflammatory effects.
- They act by inhibiting COX enzyme and thus **prostaglandin synthesis**.



- They are more commonly used as **over-the-counter** or nonprescription drugs.

CLASSIFICATION OF NSAIDs

S.NO.	CLASS	SUB-CLASS	DRUGS
1.	Nonselective COX Inhibitor (Conventional NSAIDs)	Salicylates	Aspirin
		Propionic acid derivatives [MPSC DI-2016]	Ibuprofen, Naproxen, Ketoprofen, Flurbiprofen
		Fenamate	Mephenamic acid
		Enolic acid derivatives	Piroxicam, Tenoxicam
		Acetic acid derivatives	Ketorolac, Indomethacin, Nabumetone
		Pyrazolone derivatives	Phenylbutazone, Oxyphenbutazone, Propyphenazone
2.	Preferential COX-2 Inhibitor	Nimesulide, Diclofenac, Meloxicam, Etodolac, Aceclofenac	
3.	Selective COX-2 Inhibitors	Celecoxib, Etoricoxib, Parecoxib, Rofecoxib	
4.	Analgesic Antipyretic with poor anti-inflammatory action	Para-aminophenol Derivative	Paracetamol (Acetaminophen)
		Benzoxazocine Derivative	Nefopam

Day 6

PHARMACOLOGY - IV (Hormones, Antidiabetic drugs, Contraceptive drugs, Drugs acting on uterus)

❑ INTRODUCTION OF HORMONES

- The endocrine system is a chemical coordination system comprises of **endocrine glands**, their **hormones** and their mode of action.
- **Hormones** - An informational molecule produced by **specialized cells** that is transported through **blood** and act on target organs only.

❖ Types of Glands and their examples

TYPES OF GLANDS	COMMENTS	EXAMPLE
Exocrine gland	Gland that pours secretion on the surface or into a particular region	Sebaceous glands, Sweat glands, Salivary glands, Intestinal glands
Endocrine gland	An isolated gland which hormones that are poured into venous blood for reaching the target organ	Pituitary, Adrenal, Parathyroid, Pineal and Thyroid gland.
Heterocrine gland	Mixed gland is that has both exocrine and endocrine regions	Pancreas.

❑ CLASSIFICATION OF HORMONES

❖ Based on nature of hormones

NATURE OF HORMONES	EXAMPLE
Peptide	Hypothalamus regulatory hormones, Pituitary hormones, Glucagon, Parathyroid hormone
Steroid	Adrenocortical hormones, Sex steroids
Catecholamines	Adrenaline, Noradrenaline
Others	Triiodothyronine (T ₃), Thyroxine (T ₄)

❖ Based on regulation

BODY FUNCTION	MAJOR REGULATOR HORMONES
Somatic growth	Growth hormone, Insulin like growth factors
Metabolic growth	Triiodothyronine (T ₃), Thyroxine (T ₄)
Availability of fuel	Insulin, Glucagon, Growth hormone
Sex and reproduction	Gonadotropins, Androgens, Estrogen, Progestins
Circulating volume	Aldosterone, Antidiuretic hormone
Adaptation to stress	Glucocorticoids, Adrenaline
Calcium balance	Parathormone, Calcitonin, Vitamin D

❑ SITE AND MECHANISM OF ACTION OF HORMONES

SITE	MECHANISM OF ACTION	HORMONES
On cell membrane	Increase cAMP	Most of peptide hormones, Catecholamines
	Decrease cAMP	Dopamine
	K⁺ channel opening	Somatostatin
	IP₃/DAG/Ca²⁺	Oxytocin, Vasopressin

Day 7

PHARMACOLOGY-V

(Antimicrobial drugs- Drug resistance, Sulfonamide, β -Lactam antibiotics, Cephalosporin, Tetracyclines, Chloramphenicol, Aminoglycoside, Macrolide antibiotics, Antitubercular, Antileprotics drugs)

❑ SOME IMPORTANT TERMS AND THEIR DEFINITIONS

TERMS	DEFINITION
Chemotherapy	Process of uses of chemicals (synthetic or natural) to destroy harmful microbes without disturbing the host cell body.
Antibiotics	Produced by microbes and inhibits the growth of microbes at very low concentration.
Antimicrobial agent	Antimicrobial agent is the synthetic or natural substance that are used to treatment of various infection e.g.- bacterial, fungi and viral.
Bactericidal	Means that kills bacteria.
Bacteriostatic	Means that the agent prevents the growth of bacteria.
Antibiotics Resistance	When germs like bacteria or fungi no longer respond to the drugs designed to kill them.

❑ NATURAL SOURCES OF ANTIBIOTIC

MICROORGANISMS	ANTIBIOTICS
Fungi	Penicillin, Griseofulvin, Cephalosporin
Bacteria	Polymyxin B, Tyrothricin, Colistin, Aztreonam, Bacitracin
Actinomycetes	Aminoglycosides, Macrolides, Tetracycline, Polyenes, Chloramphenicol

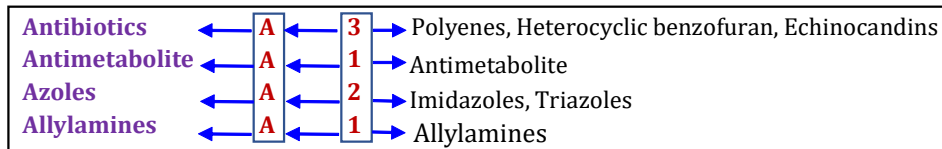
❑ ANTIBIOTICS AND THEIR MICROORGANISM

ANTIBIOTIC	MICROORGANISM
Nystatin	<i>Streptomyces noursei</i>
Candicidin	<i>Bacillus polymyxa</i>
Bacitracin	<i>Bacillus subtilis</i>
Neomycin [MPSC ASSISTANT DRUG COMMISSIONER-2014]	<i>Streptomyces fradiae</i>
Tobramycin	<i>Streptomyces tenebrarius</i>
Gentamicin	<i>Micromonospora purpurea</i>
Erythromycin	<i>Streptomyces erythraeus</i>
Mitomycin C	<i>Streptomyces caespitosus</i>
Tetracycline	<i>Streptomyces aureofaciens</i>
Chloramphenicol [MPSC ASSISTANT DRUG COMMISSIONER-2014]	<i>Streptomyces venezuelae</i>
Streptomycin [MPSC ASSISTANT DRUG COMMISSIONER-2014]	<i>Streptomyces griseus</i>
Sisomicin	<i>Micromonospora inyoensis</i>
Framycetin	<i>Streptomyces lavendulae</i>
Paromomycin	<i>Streptomyces rimosus var</i>
Colistin	<i>Bacillus colistinus</i>
Bleomycin	<i>Streptomyces verticillus</i>
Bleomycin	<i>Streptomyces verticillus</i>
Streptozocin	<i>Streptomyces achoromogenes</i>

ANTI-FUNGAL DRUGS

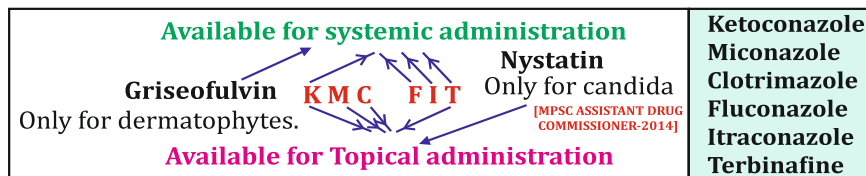
INTRODUCTION

- Most common **fungal pathogens** are - Dermatophytes, Candida, Aspergillus, Cryptococcus, Rhizopus, Histoplasma, Pneumocystis, Albicans, and Blastomyces etc.
- These are the drugs used for **superficial and deep (Systemic) fungal infection**.



CLASSIFICATION OF ANTIFUNGAL DRUGS

CLASS	DRUGS
Antibiotics	Polyenes Amphotericin B, Nystatin
	Echinocandins Caspofungin, Micafungin, Anidulafungin
	Heterocyclic benzofuran Griseofulvin
Antimetabolite	Flucytosine (5-FC)
Azoles	Imidazoles Topical: Clotrimazole [MPSC DI- 2016], Econazole, Miconazole, Oxiconazole Systemic: Ketoconazole
	Triazoles Fluconazole, Itraconazole, Voriconazole, Posaconazole, Isavuconazole
Allylamine	Terbinafine
Topical agents	Tolnaftate, Undecylenic acid, Benzoic acid, Ciclopirox olamine, Butenafine



CLASSIFICATION BASED ON MECHANISM OF ACTION

S.NO.	CLASS	MECHANISM OF ACTION
1.	Polyenes antibiotics	Cell membrane inhibitors
2.	Echinocandins	<ul style="list-style-type: none"> Cell wall synthesis inhibitors It inhibits the synthesis of β-1, 3- glucan which is the unique component of fungal cell wall. [MPSC ASSISTANT DRUG COMMISSIONER - 2023]
3.	Heterocyclic benzofuran	Disruption of mitotic spindle and inhibition of fungal mitosis.
4.	Azoles	Ergosterol synthesis inhibitors by inhibiting the lanosterol 14 α -demethylase

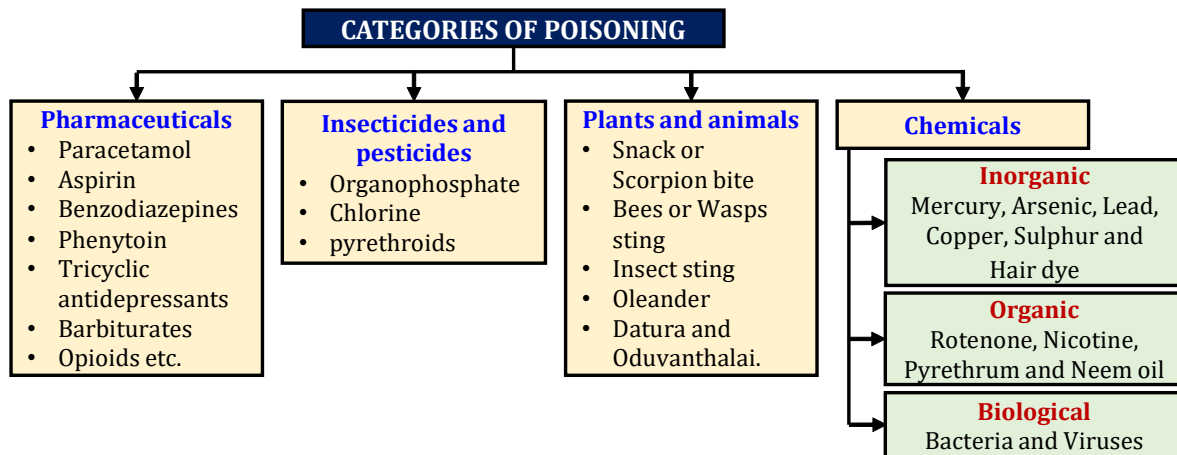
CLASSIFICATION OF POISON

INTRODUCTION

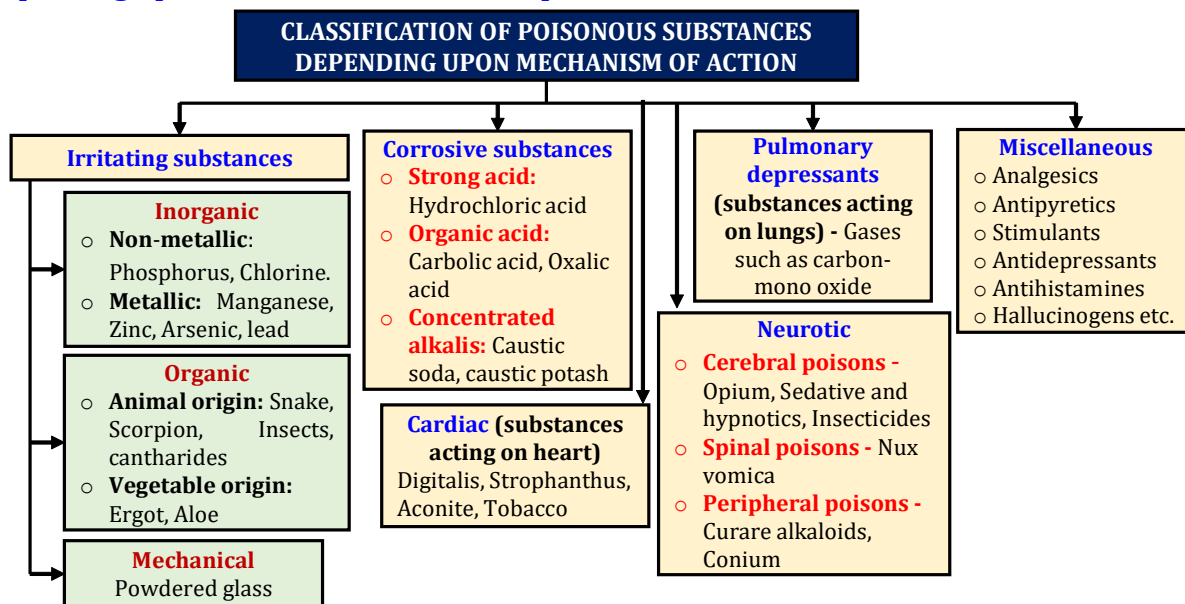
- **Toxicology** is the science that deals with the study of poisons, their source, properties, actions, detection and treatment of poisoning.
- A **poison** is any substance that, when administered, ingested, inhaled, swallowed or absorbed, applied to skin produces harmful or lethal effect on body by interfering with normal physiological function of body.

CLASSIFICATION OF POISONOUS SUBSTANCES

❖ **Categories of poisoning:** Poisoning is divided into 4 broad categories:



❖ **Depending upon mechanism of action of poisonous substances:** These are classified as:



STERILIZATION PROCEDURE

□ DEFINITION

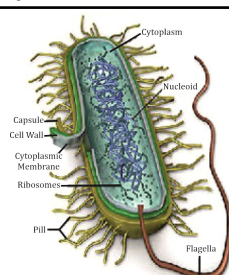
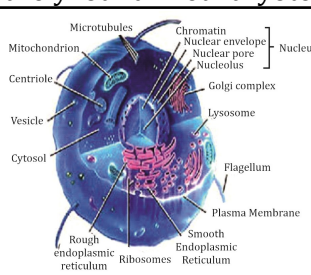
S. NO.	TERMS	DESCRIPTION
1	Sterilization	Sterilization is the process in which there is an absolute (100%) killing/elimination or inactivation of all viable organisms present in a specified region.
2	Disinfection	Disinfection is defined as a process of destruction or removal of pathogenic microorganism/ kills vegetative cells but not heat resistance spore from the object.
3	Antiseptic	Chemical agent usually applied to living tissue in humans or animals in order to destroy harmful microorganism. e.g.- Dettol, Phenol, Savlon
4	Germicide	Germicide kills all vegetative cell but not spore form of germ

□ MICROBIAL DEATH KINETICS AND TERMINOLOGY

TERMS	DESCRIPTION
D- Value (Decimal reduction time)	<ul style="list-style-type: none"> The D-value is the time (for heat or chemical exposure) or the dose (for radiation exposure) required for the microbial population to decline by one decimal point (a 90%, or one logarithmic unit, reduction) $D = \frac{U}{\log N_0 - \log N_u}$ <p>Where,</p> <ul style="list-style-type: none"> ✓ N_0 is the initial microbial population (product bio burden) ✓ N_u is the microbial population after receiving ✓ U time or dose units of sterilant exposure.
Z- Value (Thermal resistance constant)	<ul style="list-style-type: none"> Z-value describes the influence of temperature on decimal reduction time, D for microbial population. It is the increase in temperature necessary to cause a 90% reduction in D value (1 log reduction). Z-value plots of log D versus temperature
F- value (Thermal death time)	<ul style="list-style-type: none"> TDT is the minimum time required to kill all microorganisms at a specific constant temperature. F-value is the measure of total lethality of a heat sterilization process and is used to compare sterilization effectiveness.

PROKARYOTIC AND EUKARYOTIC CELLS

❑ COMPARISON OF PROKARYOTIC AND EUKARYOTIC CELLS

CHARACTERISTICS	PROKARYOTIC CELLS	EUKARYOTIC CELLS
Type of Cell	Always unicellular	Unicellular and multi-cellular
Cell size	Ranges in size from 0.2 μm – 2.0 μm in diameter	Size ranges from 10 μm – 100 μm in diameter
Nucleus	Absent. Instead, they have a nucleoid region in the cell	Present
Ribosomes	Present. Smaller in size and spherical in shape 70s ribosomes- 2 units: 50s and 30s	Present. Comparatively larger in size and linear in shape 80s ribosomes 2 units: 60s and 40s
Cytoplasm	Present, but cell organelles absent	Present, cell organelles present
Cell wall	Usually present; chemically complex in nature peptidoglycan (bacteria) or pseudopeptidoglycan (archaea)	When present, chemically simple in nature
DNA arrangement [MPSC ASSISTANT DRUG COMMISSIONER - 2023]	Circular	Linear
Cell division	By binary fusion	By mitosis
Organelles	Organism haploid, contain only a single copy of genome.	Organism usually diploid very rarely polyploids, contains two copies of genome, one from each parent.
Mitochondria	Absent	Present
Endoplasmic reticulum	Absent	Present
Golgi apparatus	Absent	Present
Plasmids	Present	Very rarely found in eukaryotes
Diagram	 <p>Prokaryotic cell (Bacteria)</p>	 <p>Eukaryotic cell (Protists, Fungi, Animals, Plants)</p>
Example	Bacteria and Archaea	Protists, fungi, Plant and Animal cell

NUCLEIC ACIDS (DNA & RNA)

INTRODUCTION

- Nucleic acids are long polymers in which the **monomeric units are nucleotides**. The nucleotides are made up of three chemical components. **They are,**
 - ✓ A nitrogen-containing heterocyclic base.
 - ✓ A five-carbon sugar.
 - ✓ A phosphoric acid moiety.
- Nucleic acids play an important role in,**
 - ✓ Transmission of hereditary characteristics
 - ✓ Biosynthesis of proteins
- Back of nucleotide – phosphate and sugar.
- Salvage pathway:** The Purine can be directly converted to corresponding nucleotide.
- RNA is template for protein synthesis – RNA.
- DNA is not direct template for protein synthesis.

Nucleic acids are the polymers of nucleotides (polynucleotides) held by 3' and 5' phosphate bridges.

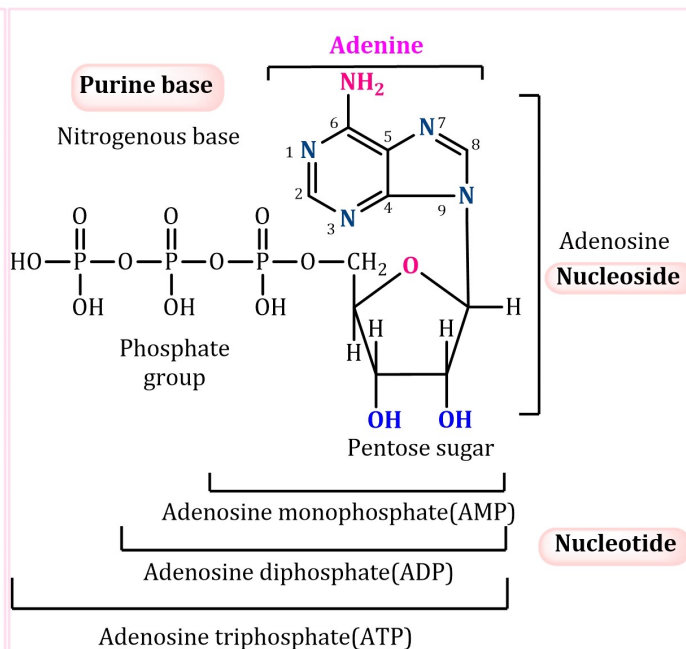
Nitrogenous base
Purine ring- Adenine (A), Guanine (G)
Pyrimidine ring - Thymine (T), Cytosine (C),
Uracil (U)

Nucleotide → Base + Sugar + Phosphate
Nucleoside

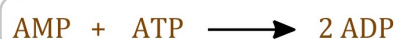
Nucleotides → Base + Sugar + Phosphate

Nucleoside → Base + Sugar

Sugars of nucleic acids - The five carbon monosaccharides (pentoses) are found in the nucleic acid structure.
RNA contains D-ribose while DNA contains D-deoxyribose.



- Phosphorylation of AMP to ADP is promoted by **Adenylate kinase**.
- Adenylate kinase** catalyzes the reaction:



Day 13

BIOTECHNOLOGY

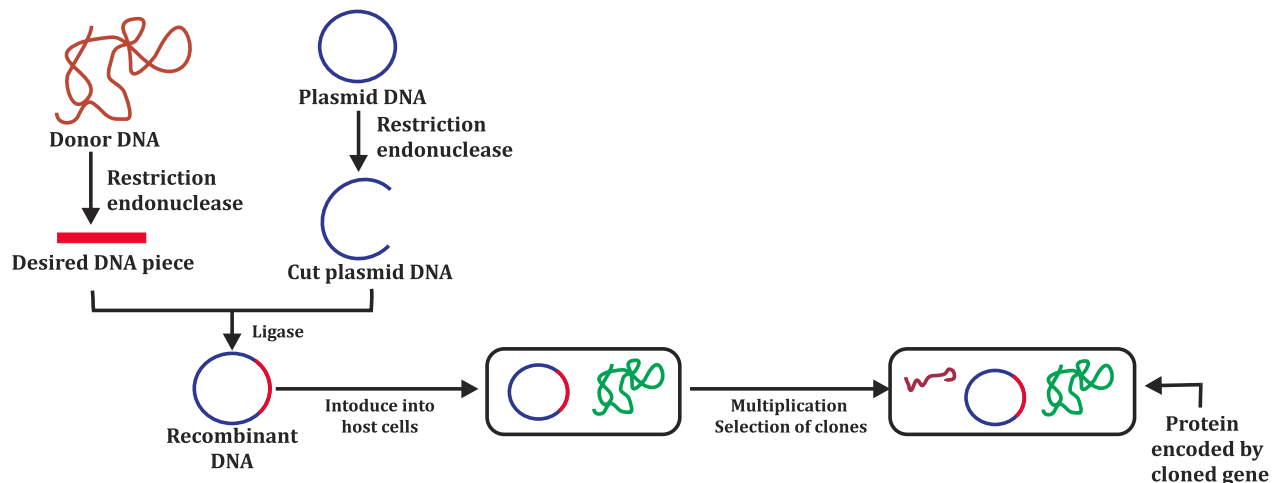
(Recombinant DNA Technology and its Application, Fermentation Technology, Immunological Product-Vaccine, Sera)

RECOMBINANT DNA TECHNOLOGY AND ITS APPLICATION

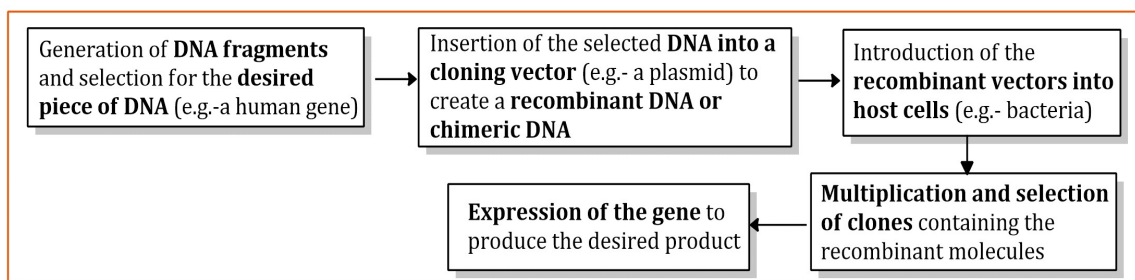
INTRODUCTION

TERMS	DESCRIPTION
Recombinant DNA technology	Recombinant DNA technology is the techniques involved in the construction , and use of recombinant DNA molecule .
Genetic Engineering	Genetic engineering primarily involves the manipulation of genetic material (DNA) to achieve the desired goal in a pre-determined way. Some other terms are also in common use to describe genetic engineering.
Genomic Library	Genomic library is collection of the total Genomic DNA fragments from a particular species represents gene libraries.
Gene Therapy	Gene therapy is the process of inserting genes into cells to treat diseases .

PRINCIPLE OF RECOMBINANT DNA TECHNOLOGY



Basic principles of rDNA Technology



ENZYMES USED IN RECOMBINANT DNA TECHNOLOGY

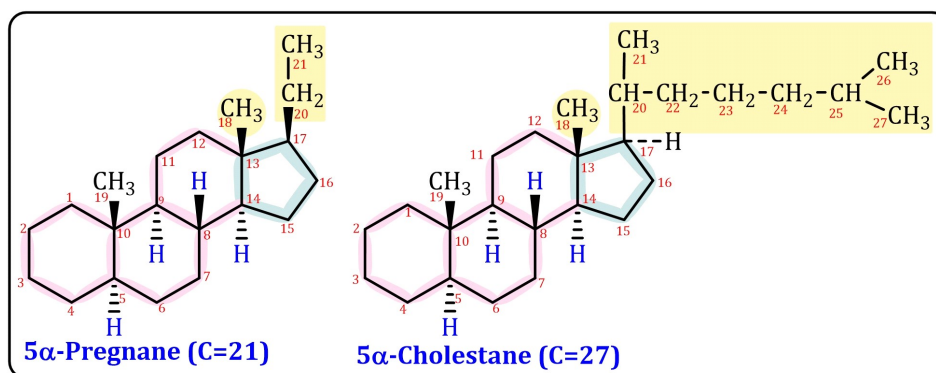
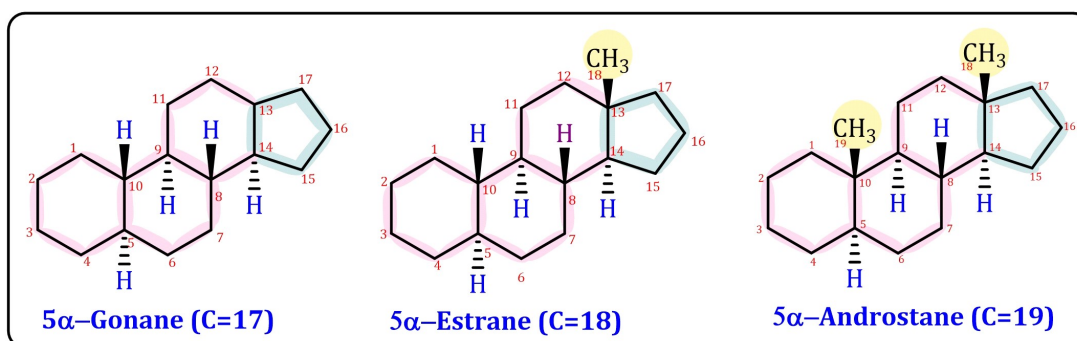
- Recombinant DNA technology relies on several key enzymes to cut, modify, join, and amplify DNA fragments for genetic manipulation.

CHEMISTRY OF STEROIDS

INTRODUCTION OF CORTICOSTEROIDS

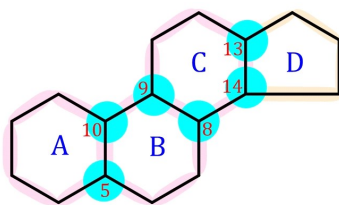
- **Corticosteroids** are a class of steroid hormones that are produced in the adrenal cortex of vertebrates, as well as the synthetic analogues of these hormones.
- Steroids are characterized by the presence of 1, 2 cyclopentano-perhydro-phenanthrene nucleus.
- Cholesterol is the precursor of these lipophilic hormones with cortisol (hydrocortisone) and aldosterone being the most prominently secreted in humans.

❖ Steroid derivative on the basis of number of carbon:



❖ Stereochemistry of corticosteroids

- There are **six asymmetric carbon** atoms **5, 8, 9, 10, 13, 14** in the nucleus, therefore **64** optically active forms are possible.



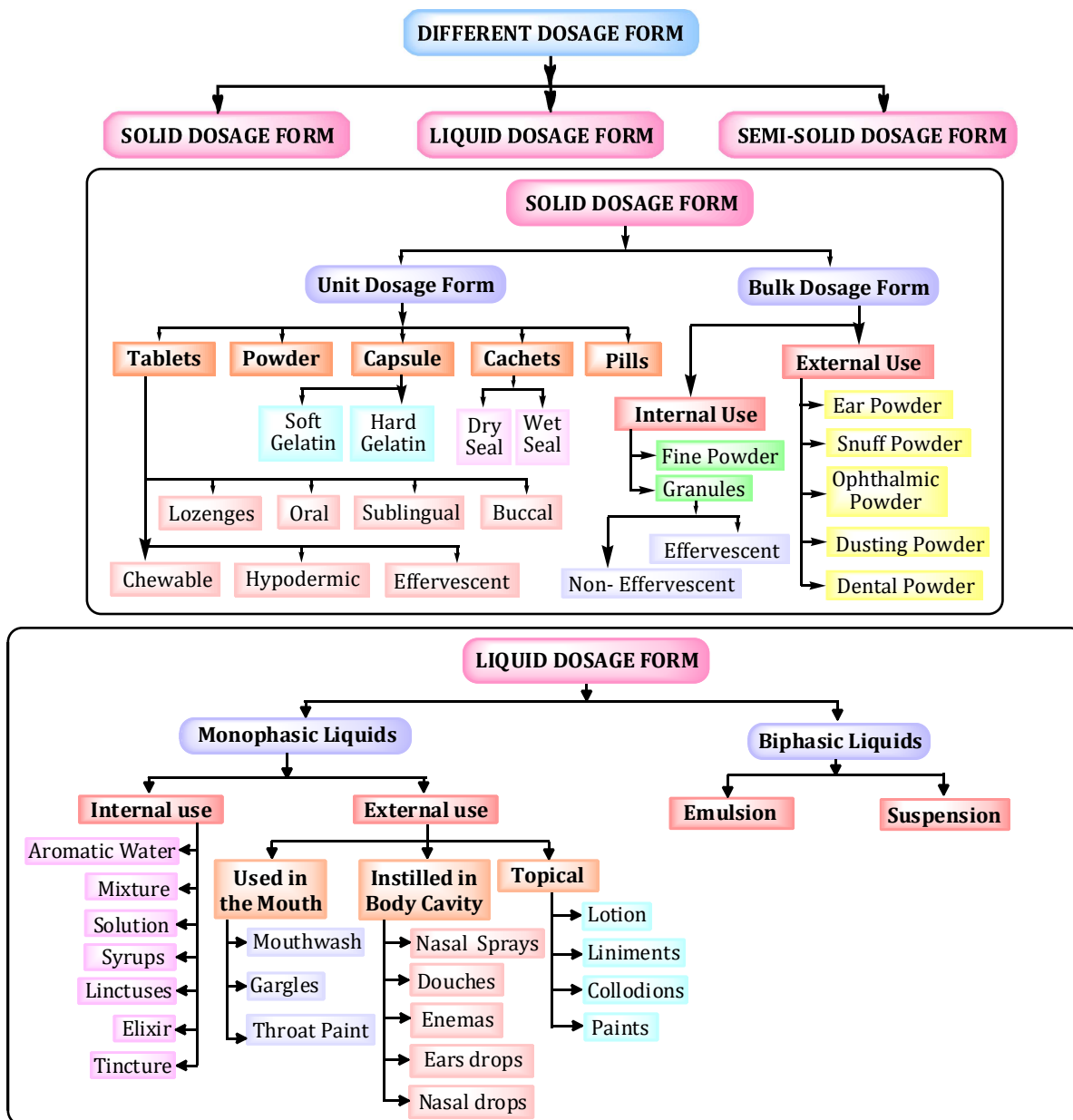
Day 15

DOSAGE FORM-I (Introduction of different dosage forms, Solid dosage form-Sustained release, enteric coating)

INTRODUCTION TO DIFFERENT DOSAGE FORMS

❑ DOSAGES FORM:

- Drugs are rarely administered in their original pure state. They are converted into suitable formulation called as dosages form.
- Based on physical state dosages form are-

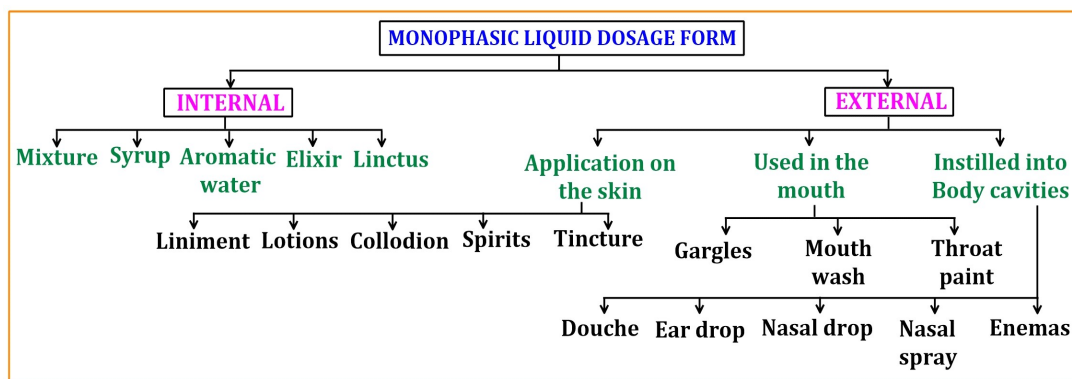


MONOPHASIC LIQUID DOSAGE FORM

INTRODUCTION

- Monophasic liquid dosage form refers to liquid preparation in which there is only one phase. It is represented by true solution.
- The component of solution present in large amount is known as 'solvent' and the component present in small amount is known as 'solute'.

CLASSIFICATION OF MONOPHASIC LIQUID DOSAGE FORM



Monophasic liquid dosage form for internal use

Mixture	It is a liquid preparation meant for oral administration in which medicament or medicaments are dissolved or suspended in a suitable vehicle.
Syrup	<ul style="list-style-type: none"> • They are concentrated solution of sugar to which medicament are often added. • Syrups contain 85% w/v sucrose or 66.7% w/w sucrose. • Glycerine, Sorbitol, and Propylene glycol is added in small quantity to the syrup to prevent the crystallization of sucrose.
Aromatic water	<ul style="list-style-type: none"> • Solution of aromatic or volatile material in water. They will deteriorate with time. • e.g - Rose water, Peppermint water, Camphor water, Chloroform water and Cinnamon water.
Elixirs	<ul style="list-style-type: none"> • They are sweetened hydroalcoholic solution. e.g.- Dexamethasone elixir and Phenobarbital elixir, USP
Lintuses	They are viscous, liquid and oral preparations that are generally prescribed for the relief of cough.

Monophasic liquid dosage form used on the skin

Liniments	<ul style="list-style-type: none"> • Liniments are liquids for cutaneous application that are intended to applied to the skin with friction and rubbing of the skin. • The liniments may be alcoholic or oily solutions or emulsions. • A liniment should not be applied to the broken skin because it may cause excessive irritation.
Lotions	<ul style="list-style-type: none"> • They are liquid preparations meant for external application without friction. e.g.- Calamine lotion, Alcohol

SEMISOLID DOSAGE FORM

❑ SKIN

- Skin is the largest multilayered organ of the body.
- **pH of skin** 4 - 5.6
- *Stratum Corneum* is the rate limiting barrier that restricts the inward and outward movement of chemical substances.
- Accelerants Swell the *Stratum Corneum* and increase permeability

❖ Penetration enhancers for topical formulations

CATEGORY	EXAMPLES
Sulphoxides	Dimethylsulfoxide (DMSO -Cryoprotectant), [Protein denaturation], Dimethylacetamide, Dimethylformamide
Cyclic	Azone, N- 0195, Amide, N-0539, N-0253
Pyrrolidones	N - methyl-2-pyrrolidone 2 pyrrolidone
Fatty acids	Oleic acid, Lauric acid, Linoleic acid, Linolenic acid
Alcohols	Ethanol, Octanol, Propylene glycol, Transcutol
Surfactants	Sodium lauryl sulphate, Cetrimide
Urea	
Terpenes	L-menthol, Nerolidol, Limonene
Phospholipid	Phosphatidylcholine

❑ INTRODUCTION OF SEMISOLID DOSAGE FORM

- Semisolid dosage forms are the topical dosage form used for the therapeutic, protective or **cosmetic functions**. It may be applied to the skin, nasal, vaginal, or rectal cavity.
- e.g. - **Ointments, pastes, cream, plasters, gels, and rigid foams.**

❑ TYPES OF SEMISOLID DOSAGE FORMS



PARENTERAL PRODUCTS

❑ INTRODUCTION

- Sterile products must be pure and free from physical, chemical and biological contaminants. They must be free of viable microorganism.
- These may be
 - ✓ Parenteral
 - ✓ Ophthalmic
 - ✓ Irrigating preparations



❑ PARENTERAL PREPARATION

- The word parenteral is derived from the Greek word '**para = outside** and **enteron intestine**.
- "Parenteral preparations are sterile preparations intended for administration by **injection, infusion or implantation** into human or animal bodies".

❖ Routes of Parental Administration

ROUTE	INJECTABLE	DESCRIPTION
Subcutaneous (SC)	Injected under skin layer Max. up to 1 - 2 ml	Oily suspension and oily solution cannot be given SC. Insulin given by SC route
Intradermal/ Intracutaneous	Injected into dermis volume 0.1 to 0.2 ml	Used for diagnostic purpose or drug sensitivity testing e.g. Tuberculin skin test
Intramuscular (IM)	Injected into skeletal muscles Up to 2 ml	Aqueous or oily suspension and oily solution can be given IM.
Intravenous(IV)	Injected into vein volume upto 500 ml to 1 L	Only aqueous preparation Used for diagnostics
Intrathecal/ Intra-spinal <small>[MPSC ASSISTANT DRUG COMMISSIONER - 2023]</small>	Injection into spinal cord volume less than 20 ml	For spinal anaesthetic and antibiotics
Intra-arterial	Injected into artery Up to 20 ml	Antineoplastic drugs, Antibiotics
Intra-articular	Given directly into the joints Up to 20 ml	Morphine, Steroids

Day 19

GOOD MANUFACTURING PRACTICES (GMP) AND GOOD LABORATORY PRACTICES (GLP)

GOOD MANUFACTURING PRACTICES (GMP)

□ INTRODUCTION

- **GMP** stands for **Good Manufacturing Practices**, a system that ensures that manufactured products—such as food, cosmetics, and pharmaceutical goods—are consistently produced and controlled according to set quality standards. [MPSC ASSISTANT DRUG COMMISSIONER - 2023]
- Implementing GMP can help cut losses and waste, and avoid recalls, fines, and jail time. Overall, it protects both the company and the consumer from negative food safety events.
- The term Good Manufacturing Practice was first used in **1962** in the **Kefauver-Harris amendment** to the **Food and Drug Act** in the United States; the FDA has set the pace for the global development of GMP.
- In **1969**, the **WHO** published its **GMP guidelines**.
- The present **WHO GMP guidelines** are based on the EEC and the ASEAN guidelines and are strongly influenced by the **ISO 9000 series** issued by the **International Organisation for Standardisation (ISO)**.

❖ Good Manufacturing Practices (GMP) for pharmaceutical products - (Schedule M)

- Good manufacturing practice is that part of quality assurance which ensures that products are consistently produced and controlled to the quality standards appropriate to their intended use and as required by the marketing authorization.
- Schedule M refers to the **Good Manufacturing Practices (GMP)** and requirements for factory premises, plant, and equipment used in the manufacture of drugs and pharmaceuticals in India, according to the Drugs and Cosmetics Act [MPSC ASSISTANT DRUG COMMISSIONER - 2014, MPSC DI - 2016]
- GMP are aimed primarily at diminishing the risks inherent in any pharmaceutical production. A draft of GMP regulations were prepared in 1975 which are finalized and implemented in 1988.

➤ Some areas that can influence the safety and quality of products that GMP guidelines and regulations address are the following:

- Quality management
- Building and facilities
- Raw materials
- Validation and qualification
- Documentation and recordkeeping
- Sanitation and hygiene
- Equipment
- Personnel
- Complaints
- Inspections & quality audits

- **Quality Control:** It may be useful to supplement self-inspections with a quality control. A quality control consists of an examination and assessment of all or part of a quality system with the specific purpose of improving it. A quality audit is usually conducted by outside or independent specialists or a team designated by the management for this purpose. Such audits may also be extended to suppliers and contractors.

PRINCIPAL AND APPLICATION OF ANALYSIS

- Spectroscopy is the measurement and interpretation of Electro Magnetic Radiation (EMR) absorbed or emitted when the molecules or atoms or ions of a sample move from one energy state to another energy state.
- The amount of radiation absorbed by the sample is measured as wavelength is varied.

❑ PRINCIPLE OF SPECTROSCOPY

- The basis of spectroscopy is that substances have an absorption spectrum or a variety of energy absorbed by the substance at various frequencies.

❖ TYPES OF SPECTROSCOPIES

TYPES	SUB-TYPES	EXAMPLES
Based on atomic or molecular level	Atomic Spectroscopy	Change in energy takes place at atomic level e.g.:- AAS, Flame photometry
	Molecular Spectroscopy	Change in energy takes place at molecular level eg:- UV, IR, Fluorimetry
Based on absorption or emission of EMR	Absorption Spectroscopy	Where absorption of radiation is being studied eg:- UV, Colorimetry, IR, NMR, AAS
	Emission Spectroscopy [MPSC DI - 2012]	Where emission of radiation is being studied eg:- Flame photometry, Fluorimetry
Based on electronic Spectroscopy or magnetic levels	Electronic Spectroscopy	Study is done using electromagnetic radiation (without the influence of magnetic field) e.g.:- UV, Colorimetry, Fluorimetry
	Magnetic Spectroscopy	Study is done using electromagnetic radiation under the influence of magnetic field e.g.:- NMR Spectroscopy, ESR Spectroscopy

❑ ELECTROMAGNETIC RADIATION

- Electromagnetic radiation is a periodically changing or oscillating electric field propagating in a certain direction with a magnetic field oscillating at the same frequency but perpendicular to the electric field.

❑ SPECTRAL REGIONS

SPECTRAL REGIONS	WAVE LENGTH	ENERGY CHANGES INVOLVED
Gamma rays	0.001nm-0.1nm	Nuclear reaction and Mossbauer spectroscopy
X-ray	0.01-2nm	Inner shell electron transition
Vacuum or far UV	2-200nm	Ionization of atoms or molecule
UV	200-400nm	Outer or valence shell electron transition
Visible	400-800nm	Outer or valence shell electron transition
IR	0.8 μ m-1 mm	Molecular vibration
Micro wave	1 mm-30 cm	Molecular rotation
Radio wave	10 m-2000 m	Nuclear spin change

Day 21

CHROMATOGRAPHY (HPLC, GLC, HPTLC AND LCMS)

CHROMATOGRAPHY

❑ INTRODUCTION

- Chromatography is the separation technique of a mixture into individual components using a stationary phase and a mobile phase.
- Stationary phase in chromatography is the one that does not move with the sample whereas the mobile phase in chromatography is one which moves with the sample.

Stationary phase	Substance that stays fixed inside the column
Mobile phase	Solvent moving through the column
Eluate	Fluid exiting the column (that is collected in flasks)
Eluent	Fluid entering the column
Elution	The process of washing out a compound through a column using a suitable solvent
Eluotropic Series	A series of solvents with an increasing degree of polarity, generally used to explain solvent strength
Analyte	Mixture whose individual components have to be separated and analyze
Solvent	Any substance capable of solubilizing another substance
Isoelectric Point	The pH points at which a molecule no longer has a net charge
Chromatogram	Visual output of the chromatograph
Separation	Different peaks or patterns on the chromatogram correspond to different components of the separated mixture
Isocratic Analysis	The procedure in which the composition of the mobile phase remains constant during the elution process [MPSC ASSISTANT DRUG COMMISSIONER - 2023]
Gradient Elution	The procedure in which the composition of the mobile phase is changed continuously or stepwise during the elution process
Stepwise Elution	The elution process in which the composition of the mobile phase is changed in steps during a single chromatographic run

HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)

❑ INTRODUCTION

- HPLC is an abbreviation for High Performance Liquid Chromatography.
- HPLC is an analytical chemistry technique applied to separate, identify, and quantify semi- and non-volatile compounds in liquid samples.

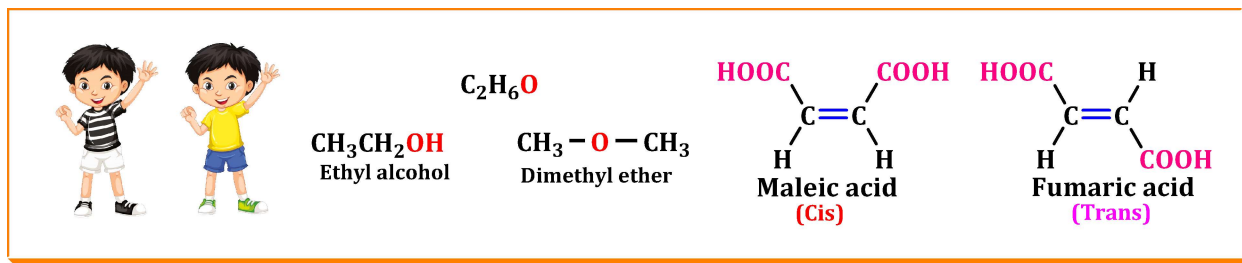
Day 22

ORGANIC CHEMISTRY AND INORGANIC CHEMISTRY (Isomers, Tautomers, Diazo Reaction, Limit Test, Heavy Metals)

ISOMERISM

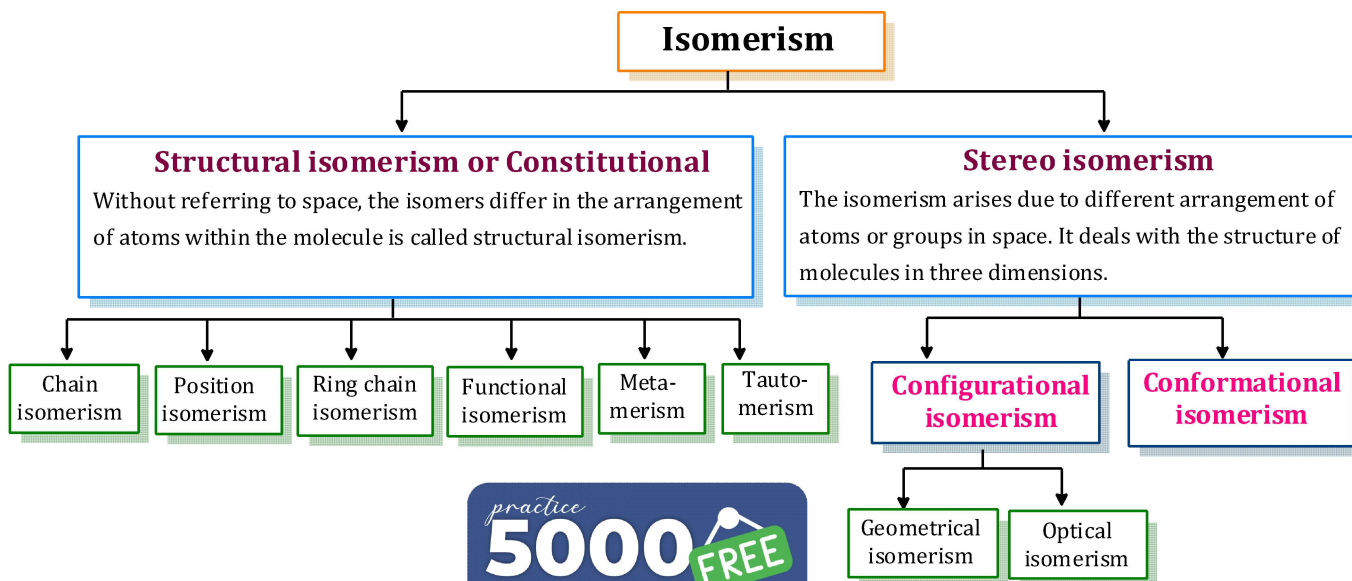
INTRODUCTION

- Organic compounds having **same molecular formula but differing** from each other at least in some physical or chemical properties or both are known as isomers (Berzelius) and the phenomenon is known as isomerism.
- The difference in properties of isomers is due to the difference in the relative arrangements of various atoms or groups present in their molecules.



✓ **There are two main types of isomerism:**

- Structural isomerism/constitutional isomerism
- Stereoisomerism/Space isomerism


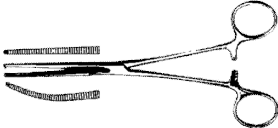

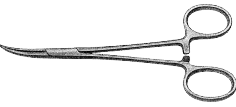



SURGICAL MEDICAL DEVICES

□ INTRODUCTION

- Knowledge of surgical instruments is very essential for any pharmacist working in a hospital. They are meant for surgical purposes. It includes wide variety of surgicals and the pharmacist is expected to handle the surgical instruments at the drug stores or in a hospital.
- Specially designed device or apparatus used to carry out a specified task during a surgical procedure.
- A surgical instrument is a medical device used during surgery to perform specific actions, such as cutting, modifying tissue, or providing access for viewing.

□ FORCEPS

INSTRUMENTS	DESCRIPTION	
Haemostatic Forceps	1. Ordinary forcep (Spencer Well's) 	It may be straight or curved, used to arrest bleeding from ordinary blood vessels. Other uses include holding of ligatures, for holding peritoneum sheath, etc. (as tissue forcep), catheter clamp, appendix crusher, sinus forcep, needle holder, dressing forcep etc.
	2. Kocher's forcep 	It may also be straight or curved and differs from the ordinary forcep in that there is a tooth at the tip of the blades. Therefore, it is suitable for holding bleeding vessels in a tough or fibrous background and vessels which have a tendency to retract.
	3. Lane's forcep 	The forcep is long with short blades. Each blade has transverse serrations, fenestration at the centre and tooth at the tip. The main function is to catch bleeding periosteal vessels.
	4. Mosquito forcep 	It is a small, straight or curved artery forcep and is used to check the blood flow from the vessels. It is generally used in appendectomy in order to pass a ligature around the appendicular artery.
Tissue Forceps	1. Alli's tissue forcep 	It is short and delicate with little gap between the blades. It is often used to hold the stomach and the intestines.

Day 24

PHARMACEUTICAL JURISPRUDENCE-I DRUGS AND COSMETICS ACT AND RULES

(Administrative bodies, Law - DCC, DTAB, Misbranded, standard, spurious, adulterated drugs definitions, Government Analyst duties, Inspector - power / procedure, definition schedule M/Y/U, Import of Drugs and Cosmetics, Central Drug Laboratory)

DRUGS & COSMETICS ACT AND RULES

❑ INTRODUCTION

- The Drugs and Cosmetics Act was passed in 1940, (10th April 1940) and Rules passed in 1945.
- This Act was amended in 1955 by the Indian Parliament and subsequently amended in 1960, 1962, 1964, 1972, 1982, 1986, 1995, 2008 and 2016.
- Major amendment was made in 1982 and latest amended up to the 31st December, 2016.

❑ IMPORTANT AMENDMENTS

- Schedule E, I and L were deleted, Schedule G and H were revised and expanded and a new Schedule X was added in 1982.
- Schedule M (GMP) and Y were introduced in 1988.
- Schedules T of Ayurvedic, Siddha and Unani medicines was introduced in 2000.
- Schedule HX, for curbing the misuse of antibiotics and other drugs in 2011.
- Good Laboratory Practices has been made as law by introducing it as Schedule L-1 which is a New Schedule under Drugs and Cosmetics Rules, 1945 vide Gazette notification no GSR 780 (E) 10-11-2008 with effect from 1-11-2010.
- The Drugs and Cosmetics Act, 1940 was indeed amended in 1964 to specifically include Ayurvedic, Siddha, and Unani drugs under its purview.

❑ OBJECTIVES

- Act to regulate the import, manufacture, distribution and sales of drugs and cosmetics.
- The main objective of Drugs and Cosmetic Act, 1940 and subsequent amendments is to regulate the import manufacture distribution and sale of drugs and cosmetics of allopathy, Ayurveda, Siddha and Unani Tibbs.
- Act regulates the manufacture and sale of drugs and cosmetics through licensing so that these are manufactured, distributed and sold only by qualified persons.

❑ CHAPTERS

This Act consist of five chapters and each chapter related to particular subject

CHAPTERS	DESCRIPTION
Chapter I	Introductory
Chapter II	Administrative Bodies: Drugs Technical Advisory Board, Central Drugs Laboratory and Drugs Consultative Committee
Chapter III	Import of Drugs and Cosmetics
Chapter IV	Manufacture, Sale and Distribution of Drugs and Cosmetics
Chapter IVA	Provisions relating to Ayurvedic, Siddha and Unani Drugs
Chapter V	Miscellaneous

DRUGS & MAGIC REMEDIES ACT AND RULES

❑ INTRODUCTION

Drugs and Magic Remedies Act Passed	1954 [MPSC DI-2008]
Drugs and Magic Remedies Act came in force	1 st April 1955
Drugs and Magic Remedies Rules came in force	1 st April 1955
Drugs and Magic Remedies Act Amendment	1963
Drugs and Magic Remedies Act was notified	30 th April, 1954

- The Act was also referred as Objectionable Advertisements Act
- Drugs and Magic Remedies Act, 1954, primarily focuses on regulating Misleading advertisements regarding drugs
- Central Government is competent under the Drugs and Magic Remedies Act, 1954 to frame rules for carrying the purpose of the act.
- This Act regulates advertisements of some drugs, magic remedies and drugs belonging to CNS acting drugs

[MPSC ASSISTANT DRUG COMMISSIONER - 2014]

❑ OBJECTIVES

- To control the advertisements of drugs in certain cases.
- To prohibit the advertisement for certain purposes of remedies alleged to possess magic qualities.
- To provide for matters connected therewith.

❑ IMPORTANT SECTIONS

Section 3	Prohibition of advertisement of certain drugs for treatment of certain diseases and disorders.
Section 4	Prohibition of misleading advertisements relating to drugs.
Section 5	Prohibition of advertisement of magic remedies for treatment of certain diseases and disorders.
Section 6	Prohibition of import into, and export from, India of certain advertisements.

❑ DEFINITIONS

Advertisement [MPSC ASSISTANT DRUG COMMISSIONER - 2023]	Any notice, circular, label, wrapper or other document, and any announcement made orally or by any means of producing or transmitting light, sound or smoke.
Magic remedy	It includes a talisman, mantra, kavacha, and any other charm of any kind which is alleged to possess miraculous powers for or in the diagnosis, cure, mitigation, treatment or prevention of any disease in human beings or animals or for affecting or influencing in any way the structure or any organic function of the body of human beings or animals.

CONSUMER PROTECTION ACT

❑ INTRODUCTION

- Consumer Protection Act was passed on 1986
- Act came into force on 24th December 1986
- The Consumer Protection Rules was passed on 1987
- The Consumer Protection Regulation was passed on 2005.
- Amendment – 1991, 1993, 2002
- It is replaced by the Consumer Protection Act 2019.
- Consumer Protection Act, 1986 extends to the whole of India except the State of Jammu and Kashmir. [MPSC DI - 2016]

❑ OBJECTIVES

- To provide for better protection of the interest of consumer by establishment of consumer council
- To establish authorities for timely and effective administration and settlement of consumers disputes and for matters connected therewith or incidental thereto.

❑ DEFINITIONS

Appropriate laboratory [MPSC ASSISTANT DRUG COMMISSIONER - 2014]	Means a laboratory or an Organisation (a) Recognised by the Central Government (b) Recognised by a State Government, subject to such guidelines as may be issued by the Central Government in this behalf (c) Established by or under any law for the time being in force, which is maintained, financed or aided by the Central Government or a State Government for carrying out analysis or test of any goods with a view to determining whether such goods suffer from any defect
Branch office	It means i. Any office or place of work described as a branch by the establishment ii. Any establishment carrying on either the same or substantially the same activity carried on by the head office of the establishment
Central Authority	Means the Central Consumer Protection Authority established under section 10
Consumer rights	i. The right to be protected against the marketing of goods, products or services which are hazardous to life and property. ii. The right to be informed about the quality, quantity, potency, purity, standard and price of goods, products or services, as the case may be, so as to protect the consumer against unfair trade practices. iii. The right to be assured , wherever possible, access to a variety of goods, products or services at competitive prices. iv. The right to be heard and to be assured that consumer's interests will receive due consideration at appropriate forums.

CENTRAL DRUG AUTHORITY

❑ INTRODUCTION

- Central Drug Authority in India is the Central Drugs Standard Control Organization (CDSCO).
 - CDSCO is the National Regulatory Authority for drugs, medical devices, and clinical trials in India.
 - The Central Drugs Standard Control Organization (CDSCO) enforces the Drugs and Cosmetics Act, 1940 and its associated Rules, 1945.
 - Head office: New Delhi.
 - Functions as the Central Drug Authority under the Ministry of Health & Family Welfare (MoHFW).
 - Operates under the Directorate General of Health Services (DGHS).
 - Headed by the Drugs Controller General of India (DCGI).
 - Role of DCGI: Approves new drugs, medical devices, and clinical trials in India.
 - Advisory bodies to DCGI:
 - ✓ Drug Technical Advisory Board (DTAB)
 - ✓ Drug Consultative Committee (DCC)
 - Union Health Minister (since June 11, 2024): Shri Jagat Prakash Nadda (also Minister of Chemicals & Fertilizers).
 - Current DCGI (2025): Dr. Rajeev Singh Raghuvanshi (reappointed for 1 year from March 1, 2025).
- **Vision:** To Protect and Promote public health in India.
- **Mission:** To safeguard and enhance the public health by assuring the safety, efficacy and quality of drugs, cosmetics and medical devices.

❑ OBJECTIVES OF CDSCO

- Improve regulators' knowledge & consumer awareness.
- Coordinate with Govt, UTs & NGOs for healthcare.
- Ensure dedication & effectiveness of regulators.
- Promote pharma science & set high standards.
- Provide transparent, science-based regulatory system & support R&D.

❑ FUNCTIONS OF CDSCO

- Approval of new drugs and clinical trials [MPSC DI-2023]
- Import Registration and Licensing [MPSC DI - 2012]
- License approving of Blood Banks, LVPs, Vaccines, r-DNA products & some Medical Devices (CLAA Scheme)
- Amendment to D & C Act and Rules
- Banning of drugs and cosmetics
- Grant of Test License, Personal License, NOCs for import/manufacture of drugs, vaccines, and medical devices for the purposes of examination, test, or analysis.
- Testing of New Drugs
- Oversight and market Surveillance through Inspectorate of Centre Over and above the State Authority
- Publication of Indian pharmacopoeia
- Guidance on Technical matters



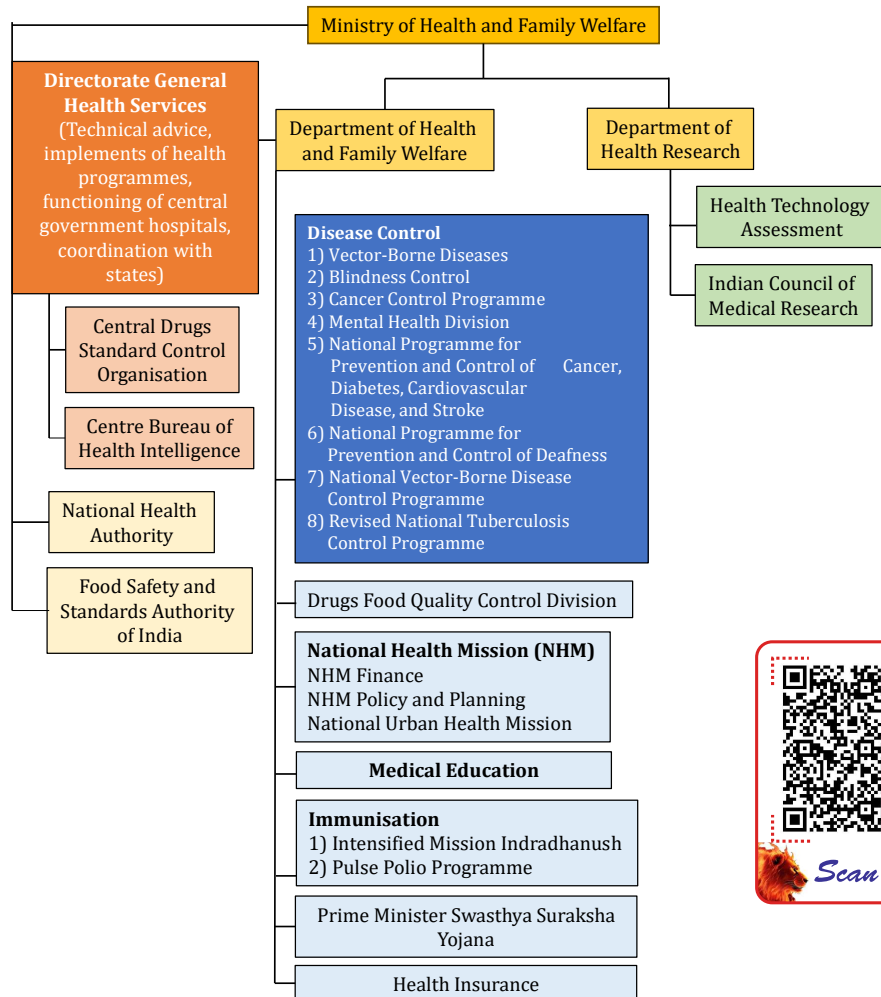
Day 28

NATIONAL HEALTH PROGRAMME, NUTRACEUTICALS

NATIONAL HEALTH PROGRAMMES

INTRODUCTION

- National Health Programmes (NHPs) are large-scale health initiatives implemented by the Government of India to control, eliminate, or manage diseases and improve population health.
- **Categories:** Communicable, Non-communicable, Maternal & Child Health (MCH), Nutrition, and Health System Strengthening.
- **Objectives:** Reduce morbidity and mortality, achieve Universal Health Coverage (UHC), and align with Sustainable Development Goals (SDGs).



Organisation of Health System in India

Day 29

**GENERAL KNOWLEDGE,
CURRENT EVENT,
NEW DRUG (USFDA)**

GENERAL KNOWLEDGE RELATED TO MAHARASHTRA STATE

➤ Geography

- Maharashtra is **located** in **Western India**.
- The **total area** of Maharashtra is **3,07,713 sq. km**, making it the 3rd largest state in India.
- Maharashtra shares its **borders** with **Gujarat, Madhya Pradesh, Chhattisgarh, Telangana, Karnataka, and Goa**.
- The state has a **coastline of 877.97 km** along the Arabian Sea.
- The **highest peak of Maharashtra is Kalsubai (1,646 m)** located in Ahmednagar district.
- The **state code of Maharashtra is MH**.
- The **largest district by area is Ahmednagar (17,048 sq. km)**.
- Maharashtra has **3 main Public Forestry Institutions (MFD, FDCM, SFD)**.
- **Inamgaon** is situated on the bank of the Ghod River.
- **Pandavkada Falls** are located in **Navi Mumbai**.
- The **National Institute of Translational Virology and AIDS Research** is in **Nagpur**.
- **Ajara Ghansal Rice** from Maharashtra has received a GI tag.
- At **Bhamragad**, the **Indravati, Pearl Kota, and Pamul Gautami** rivers meet.
- The **Nira River** is a tributary of the Bhima, flowing through Pune, Satara, and Solapur.
- The **major rivers of Maharashtra are Godavari, Krishna, Tapi, Bhima, Mula-Mutha, Wardha, and Wainganga**.
- The **world's first ultra-fast Hyperloop project in Maharashtra will connect Mumbai to Pune**.

➤ History & Heritage

- Maharashtra was formed on **1 May 1960**, which is celebrated every year as **Maharashtra Day**, after its separation from the former Bombay State.
- The **capital of Maharashtra is Mumbai**, while **Nagpur** serves as the **second (winter) capital**.
- The major **historical dynasties** that ruled over Maharashtra include the **Satavahanas, Rashtrakutas, Chalukyas, Yadavas, and the Marathas**.
- Some of the most **famous leaders** from Maharashtra are **Chhatrapati Shivaji Maharaj, Jyotiba Phule, Dr. B. R. Ambedkar, Lokmanya Tilak, and Gopal Ganesh Agarkar**.
- The people of Maharashtra are known by the **demonym Maharashtrian**.
- **Balshastrri Jambhekar** is regarded as the **Father of Marathi Journalism**.
- **Marathi Language Day** is celebrated on **27 February** every year.
- The **Koyna River** is popularly known as the **"Life Line of Maharashtra"** because of its importance in water supply and hydropower.
- A total of **7 districts in Maharashtra share their border with the Arabian Sea**.
- The **Chhapparband** caste in Maharashtra is traditionally known as **roof builders** and they **claim Rajput descent**.

VERBAL REASONING

SERIES

❑ INTRODUCTION

A series is a sequence of elements (letters, numbers, or a combination) following a rule. The task is to identify the next term, missing term, or pattern.

❖ Types of Series:

1. Alphabetical Series

- **Example:** GIJ, LNO, VXY → Each letter +5
- **String-based:** Patterns within strings, including repeating parts or adding/dropping letters.
- **Example:** abc, bcd, cde → delete first, add next

2. Numerical Series

- **Example:** 71, 59, 48, 38, 29 → next: 21
- **Example:** 5, 9, 18, 34, 59 → next: 95

3. Mixed Series

- **Example:** A1, C3, F6, J10 → Letters increase +2, +3, +4... and numbers +2, +3, +4...

QUESTIONS ASKED

- One term in the number series is wrong. Find out the wrong term 2, 5, 10, 50, 500, 5000** [MPSC DI-2008]
(a) 5 (b) 10
(c) 50 (d) 5000
Ans (d) Simplest consistent reading is that multipliers should increase ($\times 2, \times 5, \times 10, \times 20 \dots$), so the term **5000**
- How many 6's are here in the following series of number which are preceded by 7 but NOT immediately followed by 9?** [MPSC DI-2008]
6795697687678694677695763
(a) One (b) Two
(c) Three (d) Four
Ans (c) Check the string 679569 (768) (767) 8694677695 (763). The 6's preceded by 7 and not followed by 9 occur **3 times**
- Which letter will replace the question mark (?) J L N P R T ?** [MPSC DI-2008]
(a) S (b) U
(c) V (d) W
Ans (c) Letters increase by 2 positions each time: J(+2)=L, L(+2)=N, ... T(+2)=V.
- Select the numbers from given alternatives, which will complete the given sequence. 109 __, 95, __, 81, 74** [MPSC DI - 2012]
(a) 102, 87 (b) 102, 88
(c) 103, 88 (d) 101, 89
Ans (b) each step is (-7) = 109 → **102** → 95 → **88** → 81 → 74.

Statements:

- 1) Some climbers are plants
- 2) All plants are trees
- 3) Some climbers are strong

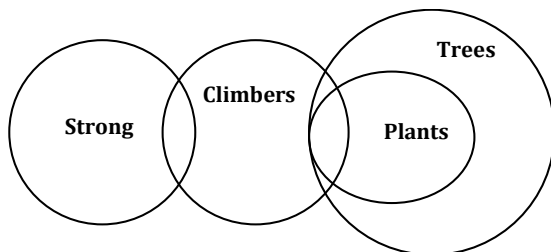
Conclusions:

- I. Some plants are strong
- II. Some trees are strong
- III. No plant is strong

Options:

- (a) Only conclusion I follows
- (b) Only conclusion II follows
- (c) Either conclusion II or III follows
- (d) Both conclusions I and II follow

Ans (c)



6. Three statements are given followed by three conclusions numbered I, II and III Assuming the statements to be true. even if they seem to be at variance with commonly known facts, decide

which of the conclusions logically follow(s) from the statements [MPSC ASSISTANT DRUG COMMISSIONER - 2023]

Statements:

- 1) Some cups are saucers
- 2) No saucer is a pan
- 3) All pans are mugs

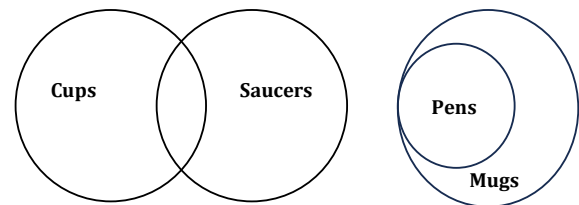
Conclusions:

- I. Some pans are cups
- II. No cup is a pan
- III. Some mugs are saucers

Options:

- (a) Only conclusion I follows
- (b) Only conclusion III follows
- (c) Either conclusion II follows or conclusions I and III together follow
- (d) Either conclusion I or II follows, but III is uncertain

Ans (d)



PRACTICE MCQs

Type #1:

Two or more Statement and Conclusions

Give Answer (Ex-1-5)

- (a) If only Conclusion I follows
- (b) If only Conclusion II follows
- (c) If neither I nor II follows
- (d) If both Conclusions I and II follow

1. **Example**

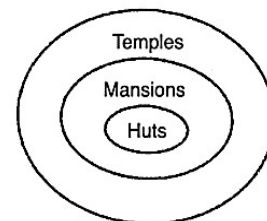
Statements

- All huts are mansions.
- All mansions are temples.

Conclusions:

- I. Some temples are huts.
- II. Some temples are mansions.

Ans (d)



Clearly, some temples are huts as well as some temples are mansions.

So, both conclusions follow.

2. **Example**

Statements

- Some camels are ships.
- No ship is a boat.

Step 1: Determine the pattern for opposite segments.

Let's examine the relationship between the opposite numbers:

- 2 and 5: $2+3=5$
- 3 and 7: $3+4=7$
- 4 and 9: $4+5=9$

The pattern seems to be that the number in the opposite segment is found by adding a consecutive integer (3, 4, 5) to the original number. **Step 2: Apply the pattern to find the missing number.**

Following this pattern, for the number 5, we should add the next consecutive integer, which is 6.

So, the missing number is $5 + 6 = 11$.

2. **Select the pair that has a relationship similar to that in the original pair [MPSC DI-2008]**



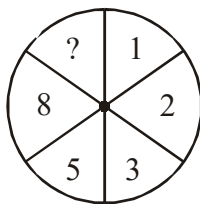
(I) (II) (III) (IV)

- (a) I (b) II (c) III (d) IV

Ans (a)

It perfectly mirrors the original relationship — inner shape (triangle) is shown alone in the second image.

3. **The missing number in the given figure is [MPSC DI-2008]**



- (a) 15 (b) 13 (c) 12 (d) 10

Ans (b)

Let's analyze the pattern:

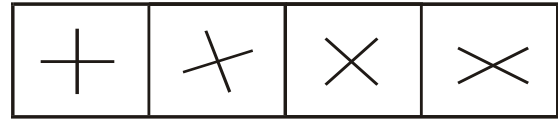
- $1 + 2 = 3$
- $2 + 3 = 5$
- $3 + 5 = 8$
- $5 + 8 = 13$

This is a Fibonacci sequence, where each

number is the sum of the two preceding numbers.

So, the missing number is: 13

4. **Choose the figure different from the [MPSC DI-2008]**



(I) (II) (III) (IV)

- (a) I (b) II (c) III (d) IV

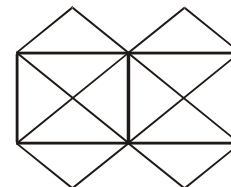
Ans (a)

Figure I is different from the others in terms of:

- Orientation (not diagonal)
- Intersection angle (90° , not acute)
- Shape (plus vs. cross)

Hence, Figure I is the odd one out.

5. **What is the minimum number of straight lines that is needed to construct the figure [MPSC DI-2008]**



- (a) 11 (b) 13 (c) 15 (d) 21

Ans (b)

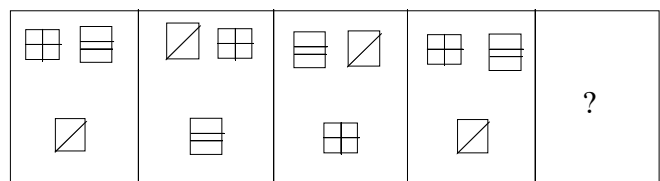
The figure has:

- 4 sides of squares (shared side counts once) $\rightarrow 7$ lines
 - 2 diagonals per square $\rightarrow 4$ lines
 - 1 horizontal line across the middle $\rightarrow 1$ line
- Total = $7 + 4 + 1 = 12$ lines

But due to overlapping lines and minimum usage:

Minimum lines needed = 13

6. **A figure series is given with a blank space shown by (?). Select the suitable figure from given alternatives, which will continue the same series [MPSC DI - 2012]**



MPSC ASSISTANT DRUG COMMISSIONER-2023



- The substance involved in the control of platelet production is**
(a) Plasminogen (b) Thrombopoietin
(c) Fibrinogen (d) Erythropoietin
- Plasma from which the clotting factors are removed is known as**
(a) Lymph (b) Serum
(c) Plasmin (d) Platelet
- Vitamin K is essential for the synthesis of the following factors EXCEPT**
(a) Factor IX (b) Factor X
(c) Factor III (d) Factor II
- The shape of erythrocyte disc is**
(a) Biconvex (b) Concave
(c) Convex (d) Biconcave
- Neutrophils squeeze through the capillary walls in the area of infection through a process called**
(a) Decussation (b) Dysplasia
(c) Deglutition (d) Diapedesis
- The clotting factor, Factor IX is otherwise known as**
(a) Christmas Factor (b) Hageman Factor
(c) Labile Factor (d) Stuart Prower Factor
- AIDS is a/an _____ immunodeficiency disease**
(a) Secondary (b) Primary
(c) Tertiary (d) Quaternary
- Trichomonas vaginalis* is a**
(a) Fungi (b) Bacteria
(c) Protozoa (d) Virus
- The type of spirochaete bacteria responsible for producing syphilis is**
(a) Leptospira (b) Helicobacter
(c) Borrelia (d) Treponema
- The gene for reverse transcriptase which act as marker for laboratory diagnosis of HIV infection is**
(a) Gag (b) Tat
(c) Pol (d) Env
- Type I hypersensitivity reaction is mediated by antibodies**
(a) IgM (b) IgA
(c) IgG (d) IgE
- Which drug among the following antifungals act by inhibiting the formation of glucan in fungal cell wall**
(a) Allylamines (b) Polyenes
(c) Echinocandins (d) Azoles
- _____ is the main mineralocorticoid in humans**
(a) Serotonin (b) Aldosterone
(c) Cortisol (d) Androgen
- One among the following drug is a Vitamin K antagonist anticoagulant**
(a) Enoxaparin (b) Dalteparin
(c) Warfarin (d) Heparin
- A drug with high affinity for receptor and high intrinsic activity is a/an**
(a) Agonist (b) Antagonist
(c) Partial agonist (d) Inverse agonist
- The major carrier protein of acidic drugs in the blood stream is**
(a) Globulin (b) Keratin
(c) Ferritin (d) Albumin
- Which among the following drug is a reversible carbamate inhibitor used for the treatment of Alzheimer disease**
(a) Tacrine (b) Galantamine
(c) Rivastigmine (d) Donepezil
- The enteral route of administration depicts one among the following route**
(a) Intrathecal (b) Buccal
(c) Transdermal (d) Inhalation
- Dipeptidyl peptidase IV is a _____ protease**
(a) Threonine (b) Aspartic
(c) Cysteine (d) Serine



MPSC DRUG INSPECTOR - 2016



- HIV/AIDS is diagnosed by some specific tests. Identify which among the following test is/are used**
 - ELISA
 - DNA-PCR by amplification
 - Western blot
 - All of these
- What is the antidote for Lead poisoning**
 - Dimercaptosuccinic acid
 - Physostigmine
 - Fomepizole
 - Atropine
- Which of the following drugs is NOT a Tocolytic**
 - Ritodrine
 - Magnesium sulfate
 - Nifedipine
 - Ergotamine
- Which of the following NSAIDs is NOT a propionic acid derivative**
 - Ibuprofen
 - Naproxen
 - Oxaprozin
 - Piroxicam
- Which anticoagulant is produced by mast cells and basophils**
 - Heparin
 - Prostaglandin
 - Histidine
 - Vitamin K
- Under which rule of Drugs and Cosmetics Act, 1940 and rules 1945, licences for blood banks are issued**
 - 122 G
 - 122 A
 - 160 B
 - 150 B
- Match the following**

(P) Thromboplastin	(I) Factor VII
(Q) Proconvertin	(II) Factor III
(R) Fibrinogen	(III) Factor II
(S) Prothrombin	(IV) Factor I

 - P-(II), Q-(I), R-(IV), S-(III)
 - P-(III), Q-(IV), R-(I), S-(II)
 - P-(I), Q-(II), R-(III), S-(IV)
 - P-(III), Q-(IV), R-(II), S-(I)
- Basophils originate in**
 - Megakaryoblast
 - Monoblast
 - Megakaryocyte
 - Myeloblast
- Match the following anticancer drugs with their cell cycle effects**

(P) Cytarabine (ARA-c)	(I) G ₁ -S phase
(Q) Etoposide	(II) M phase
(R) Vincristine	(III) G ₂ -M phase
(S) Bleomycin	(IV) S phase

 - P-(IV), Q-(I), R-(II), S-(III)
 - P-(IV), Q-(II), R-(I), S-(III)
 - P-(I), Q-(II), R-(III), S-(IV)
 - P-(IV), Q-(III), R-(I), S-(II)
- Which of the following is an ester and short-acting Local anaesthetic**
 - Tetracaine
 - Dibucaine
 - Lidocaine
 - Procaine
- Antifungal Antibiotic Amphotericin B is obtained from**
 - Streptomyces pimprina*
 - Penicillium griseofulvum*
 - Streptomyces nodosus*
 - Both (a) and (c)
- Which of the following drugs is NOT an enzyme - inducer**
 - Phenobarbitone
 - Phenytoin
 - Rifampin
 - Cimetidine
- One of the following drugs is most widely used as local anaesthetic for infiltration, regional nerve block, epidural and subarachnoid anaesthesia. It is also commonly used for topical anaesthesia**
 - Cocaine hydrochloride
 - Procaine hydrochloride
 - Lidocaine hydrochloride
 - Mepivacaine hydrochloride



MPSC ASSISTANT DRUG COMMISSIONER-2014



- _____ is NOT the component of blood proteins
(a) Albumin (b) Proconvertin
(c) Globulin (d) Fibrinogen
- For import of drugs specified in the "Schedule X" a license in which form will license be required
(a) Form -10 (b) Form - 10A
(c) Form -10B (d) Form 8
- "Illicit traffic" in relation to narcotic and psychotropic substances means
(A) Cultivating any coca plant or gathering any portion of coca plant
(B) Cultivating opium poppy or any other cannabis plant
(C) Selling of Metoprolol tartrate
(D) Importing Montelukast
(a) (A) only (b) (A) and (B) only
(c) (A), (B) and (C) (d) (A), (B) and (D)
- Ototoxicity and Nephrotoxicity are the selective toxicities of
(a) Penicillin (b) Cephalosporin
(c) Aminoglycosides (d) Quinolones
- The scarlet fever
(A) Is caused by streptococcus pyogenes
(B) Is caused by enteric viruses
(C) Is caused by respiratory viruses
(D) Caused fever with rose spot formation
(a) (A), (B), (C) (b) (A), (D)
(c) (A), (C) (d) (B), (C)
- The antidote BAL is used to reduce toxicity of
(a) Iron (b) Pesticides
(c) Barbiturates (d) Mercury
- The time a drug takes to reach an effective concentration or steady state level depends on its
(a) Plasma protein binding
(b) Plasma concentration in circulation
(c) Rate of elimination from the body
(d) Rate of absorption in the body
- Match the following antibiotics with the organism from which they are obtained
 - Streptomycin
 - Neomycin
 - Chloramphenicol
 - Rifampicin(A) *Streptomyces fradiae*
(B) *Streptomyces venezuelae*
(C) *Streptomyces mediterranei*
(D) *Streptomyces griseus*
(a) 1-(A), 2-(C), 3-(D), 4-(B)
(b) 1-(D), 2-(A), 3-(B), 4-(C)
(c) 1-(A), 2-(B), 3-(C), 4-(D)
(d) 1-(B), 2-(D), 3-(C), 4-(A)
- An interview was scheduled at certain time. Personal Assistant arrived at 10:40 AM that is 35 minutes earlier than Chairperson. Chairperson was late for interview by 25 minutes. What the scheduled time of the interview
(a) 11:50 AM (b) 11:15 AM
(c) 11:05 AM (d) 11:10 AM
- What is a Central Drug Authority
(A) DCGI
(B) DGHS
(C) Drugs Inspector
(D) Independent office under the Ministry of Health and Family Welfare
(a) (A) only (b) (A) and (B) only
(c) (A) and (C) only (d) (D) only
- As per I.P. the dispersion obtained when dispersible tablets are added to water, must pass through a sieve with nominal mesh aperture of
(a) 710 μm (b) 250 μm
(c) 425 μm (d) 510 μm



MPSC DRUG INSPECTOR - 2008



- Which enzyme is used by the HIV to form DNA in host cell**
(a) Endonuclease (b) Reverse Transcriptase
(c) Isomerase (d) None of these
- Mumps is an acute disease caused by _____ organism**
(a) HIV (b) Paramyxovirus
(c) Polio virus (d) Hepatitis virus
- The agents that control growth of microorganisms on inanimate objects are referred as**
(a) Sterilants (b) Antiseptics
(c) Antibiotics (d) Disinfectants
- Preservatives are not to be included in the formulation of injectables, administered by _____ route**
(a) Intramuscular (b) Subcutaneous
(c) Intraocular (d) Intradermal
- In the LAL test cells are used for the detection of pyrogen**
(a) Plasma (b) Lymphocyte
(c) Red blood (d) Amoebocyte
- Nandu remembers that Sachin's birthday is certainly after 18th August but not after 22nd August. Meeta certainly remembers that Sachin's birthday is before 20th August and after 17th August. If both of them correct, then when is Sachin's Birthday**
(a) 19 (b) 22
(c) 21 (d) 20
- Which one of the following is NOT a Sexually Transmitted Disease (STD)**
(a) Gonorrhoea (b) Syphilis
(c) Chancroid (d) Hepatitis
- In an autoclave, sterilization by moist heat is carried out at**
(a) 160°C for 1 hour
(b) 180°C for 30 minutes
(c) 121°C and 15 psi pressure for 15 minutes
(d) 100°C and 10 psi pressure
- The limit test for acid-insoluble ash gives**
(a) Inorganic impurities (b) Organic impurities
(c) Siliceous impurities (d) None of these
- Which of the following equations is useful in calculating shelf life of pharmaceuticals in accelerated stability testing**
(a) Noye's-Whitney equation
(b) Gibb's Helmholtz equation
(c) Arrhenius equation
(d) Stokes equation
- Drug sample taken by the drug inspector for analysis is sent to**
(a) Drug controller
(b) Chief inspector
(c) Government analyst
(d) Public testing Laboratory
- Central Register of pharmacists is maintained by**
(a) State Health Ministry
(b) Pharmacy Council of India
(c) State Pharmacy Council
(d) Drug Controller of India
- The drug _____ is not included in the first schedule of DPCO**
(a) Rifampicin (b) Paracetamol
(c) Aspirin (d) Vitamin C
- A local anaesthetic agent suitable only for injection is**
(a) Tetracaine (b) Benzocaine
(c) Dibucaine (d) Procaine
- In a person infected with HBV, the first virological marker detectable in serum is**
(a) HBsAg (b) HBcAg
(c) HBeAg (d) Anti-HBs



146. DHO (District Health Officer) is responsible for enforcement of one of the following

- (a) NAMP - National Anti-malaria Programme
- (b) NLEP - National Leprosy Eradication Programme
- (c) NMHP - National Mental Health Programme
- (d) NWSS - National Water Supply and Sanitation

147. Which one of these antileprotic drugs possesses anti-inflammatory action

- (a) Dapsone
- (b) Clofazimine
- (c) Rifampicin
- (d) Ethionamide

148. Rideal-Walker Coefficient (RWC) is to be stated on labels of

- (a) Antibiotic preparations
- (b) Disinfectant fluids
- (c) Sunscreen preparations
- (d) Shampoo

149. Erythromycin belongs to the class of

- (a) Macrolide
- (b) β -lactam
- (c) Aminoglycoside
- (d) Peptide

150. Aspartame is used as

- (a) Sweetener
- (b) Colorant
- (c) Binder
- (d) Lubricant

ANSWER KEY

1-b	2-b	3-d	4-c	5-d	6-a	7-d	8-c	9-c	10-c
11-c	12-b	13-b	14-d	15-a	16-a	17-a	18-b	19-b	20-a
21-b	22-c	23-d	24-b	25-b	26-c	27-a	28-c	29-d	30-b
31-a	32-c	33-d	34-d	35-c	36-b	37-d	38-b	39-b	40-a
41-b	42-d	43-d	44-a	45-a	46-a	47-a	48-d	49-b	50-b
51-b	52-c	53-c	54-c	55-c	56-a	57-c	58-d	59-d	60-b
61-d	62-d	63-b	64-c	65-c	66-b	67-a	68-c	69-b	70-c
71-a	72-b	73-b	74-b	75-b	76-a	77-a	78-c	79-c	80-b
81-b	82-a	83-b	84-c	85-c	86-d	87-b	88-c	89-d	90-c
91-a	92-a	93-b	94-b	95-a	96-d	97-c	98-c	99-b	100-a
101-c	102-b	103-b	104-d	105-c	106-a	107-b	108-d	109-c	110-a
111-a	112-a	113-b	114-b	115-c	116-a	117-a	118-a	119-a	120-d
121-b	122-c	123-a	124-b	125-a	126-c	127-d	128-a	129-a	130-b
131-d	132-d	133-a	134-c	135-d	136-c	137-d	138-d	139-b	140-b
141-c	142-c	143-c	144-d	145-c	146-a	147-b	148-b	149-a	150-a

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