CUET PG 2024 Pharmacy Question Paper with Solutions

Time Allowed :1 hour 45 minutes	**Maximum Marks :**300	**Total questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

(i) This question paper comprises 75 questions. All questions are compulsory.

(ii) Each question carries 04 (four) marks.

(iii) For each correct response, candidate will get 04 (four) marks.

(iv) For each incorrect response, 01 (one) mark will be deducted from the total score.

(v) Un-answered/un-attempted response will be given no marks.

(vi) To answer a question, the candidate needs to choose one option as correct option.

(vii) However, after the process of Challenges of the Answer Key, in case there are multiple correct options or change in key, only those candidates who have attempted it correctly as per the revised Final Answer Key will be awarded marks.

(viii) In case a Question is dropped due to some technical error, full marks shall be given to all the candidates irrespective of the fact who have attempted it or not

1. Which of the following feature is correct for counter current extraction of plant material?

(1) Can be used for only lab scale and wide array of extractives possible

(2) Can be used for large scale and only few extractives are possible

(3) Can be used for large scale and wide array of extractives possible

(4) Can be used for small scale and only few extractives are possible

Correct Answer: (3) Can be used for large scale and wide array of extractives possible

Solution: Counter current extraction is a highly efficient method where fresh solvent is continually supplied in the opposite direction to the solid material flow. This ensures continuous interaction between the solvent and plant material, enhancing the yield.
The method is especially suitable for large-scale production as it minimizes solvent use while effectively extracting a broad range of active compounds. Industries such as pharmaceuticals, cosmetics, and food commonly adopt this technique for its efficiency and scalability.

Quick Tip

For large-scale plant material extraction, counter current extraction optimizes both efficiency and extractive diversity.

---

2. The principle of Pulse height proportionality to particle volume is used in:

(1) Fisher apparatus

(2) Coulter counter

(3) Sedimentograph

(4) Erweka multimodal instrument

Correct Answer: (2) Coulter counter

Solution: The Coulter counter operates based on the principle that particle volume is directly proportional to the pulse height generated as a particle passes through an aperture. When a particle suspended in an electrolyte solution flows through a narrow aperture, it momentarily displaces some of the electrolyte. This causes a change in electrical resistance, producing a voltage pulse. The amplitude (height) of this pulse is directly proportional to the particle's size.
This method is widely used in hematology for counting blood cells and in industrial applications for particle size analysis.

Quick Tip

The Coulter counter is ideal for counting and sizing particles in suspension.

---

3. About Theobroma oil polymorph choose the correct statement:

(1) Gamma form has 18°C melting point

(2) Beta form has 34-35°C melting point

(3) Beta prime form has 28 - 31°C melting point

(4) Alpha form has 24°C melting point

Correct Answer: (2) Beta form has 34-35°C melting point

Solution: Theobroma oil (cocoa butter) has several polymorphic forms:

Gamma form: Melts at 18°C; unstable and not preferred. Alpha form: Melts at 24°C; unstable.

Beta-prime form: Melts at 28-31°C; intermediate stability.

Beta form: Melts at 34-35°C; this is the most stable form.

The beta form is critical for pharmaceutical applications and chocolate manufacturing due to its stability and desirable melting properties.

Quick Tip

The beta form's stable crystalline structure is key for ensuring product stability in pharmaceutical applications.

---

4. Globular proteins are believed to maintain their:

(1) Ball-like structure due to hydrophobic interaction

(2) Ball-like structure due to hydrophilic interaction

(3) Sheet-like structure due to hydrophobic interaction

(4) Parallel sheet-like structure due to hydrophobic interaction

Correct Answer: (1) Ball-like structure due to hydrophobic interaction

Solution: Globular proteins fold into compact, spherical shapes mainly due to hydrophobic interactions.

Hydrophobic residues are buried in the core to avoid contact with the surrounding water

molecules, while hydrophilic residues remain exposed on the surface. This folding pattern stabilizes the protein's structure and supports its biological functions, including enzyme activity and cell signaling.

Quick Tip

Hydrophobic interactions drive the folding of globular proteins into their stable, functional forms.

---

5. Yellow fever vaccine is a:

(1) Univalent preparation made by 17D strain of Yellow fever virus

(2) Polyvalent preparation made by 17D strain of Yellow fever virus

(3) Univalent preparation made by 170D strain of Yellow fever virus

(4) Polyvalent preparation made by 170D strain of Yellow fever virus

Correct Answer: (1) Univalent preparation made by 17D strain of Yellow fever virus

Solution: The Yellow fever vaccine is a live attenuated vaccine derived from the 17D strain of the Yellow fever virus.

It is classified as a univalent preparation because it targets only one strain — the 17D strain. This vaccine is widely recognized for its strong and long-lasting immunity. The World Health Organization (WHO) recommends it for travelers visiting endemic regions, and it plays a vital role in controlling outbreaks.

Quick Tip

Yellow fever vaccines derived from the 17D strain are among the most successful and effective viral vaccines.

---

6. Miller Prickett tube:

(1) Contains Oxidizing agent and used in counting of aerobes

(2) Contains Vitamin B12 and used in counting of specific bacteria

(3) Contains reducing agent and used in counting of anaerobes

(4) Contains Vit B2 and used in counting of Spirochetes

Correct Answer: (1) Contains Oxidizing agent and used in counting of aerobes

Solution: The Miller Prickett tube is used in microbiological studies to identify and count different types of bacteria. The oxidizing agent in the tube is specifically used for counting aerobes.

Quick Tip

For identifying bacteria in different environments, consider the type of agent used in the medium, as it determines the growth of specific types of bacteria.

---

7. Elutrition depends upon

(1) Movement of fluid against the direction of sedimentation of particles

(2) Movement of fluid in the direction of sedimentation of particles

(3) Movement of fluid against the horizontal direction of sedimentation of particles

(4) It is possible in all direction of fluid flow

Correct Answer: (1) Movement of fluid against the direction of sedimentation of particles

Solution: Elutrition is a process used in sedimentation, where the fluid is moved in the opposite direction of the settling or sedimentation of particles. The purpose of elutrition is to separate particles based on their size, shape, and density.

In sedimentation, particles settle due to gravity, and elutrition helps in counteracting this sedimentation by moving the fluid in the opposite direction, assisting in better separation and clearer distinctions between different types of particles.

This is the reason why elutrition depends on the movement of the fluid against the sedimentation direction of the particles, ensuring the particles are maintained in suspension for further processing.

Quick Tip

In elutrition, the fluid's movement counteracts the natural sedimentation process, aiding in better separation of particles based on their properties.

---

8. Bound moisture of a solid is

(1) Liquid that exerts vapour pressure equal to that of free liquid

(2) Liquid that exerts a pressure less than that of pure liquid

(3) Liquid that exerts a pressure more than that of a pure liquid

(4) Liquid that exerts pressure equal to the ratio of vapour pressure of pure liquid to the vapour pressure of its supersaturated solution

Correct Answer: (2) Liquid that exerts a pressure less than that of pure liquid

Solution: Bound moisture refers to the moisture in a solid material that is bound by intermolecular forces or chemical bonds, such as in hygroscopic materials or clay.

Unlike free moisture, which can easily evaporate from the solid and exerts vapor pressure equal to that of the pure liquid, bound moisture is held by forces that restrict its movement.

The pressure exerted by this moisture is less than the vapor pressure of the pure liquid because the molecules are not free to move independently but are constrained by the solid's structure. This is why the bound moisture exerts a lower pressure.

This type of moisture is typically harder to remove from the solid due to its bound nature, and its presence is important in determining the physical properties of the solid material.

Quick Tip

Bound moisture is chemically or physically attached to the solid, and its removal is not as straightforward as free moisture, which evaporates easily.

---

9. Compound Aluminium paste BPC contains

(1) Aluminium hydroxide powder and zinc oxide

(2) Aluminium powder and zinc oxide

(3) Aluminium powder, Liquid paraffin, and zinc oxide

(4) Aluminium powder, soft paraffin, and zinc oxide

Correct Answer: (3) Aluminium powder, Liquid paraffin, and zinc oxide

Solution: Compound Aluminium paste BPC (British Pharmacopoeia) is used in various pharmaceutical and cosmetic formulations. It contains the following components:

Aluminium powder: This is a fine powder of aluminium metal, used for its astringent and protective properties in certain medical applications.

Liquid paraffin: A mineral oil used as a binder or lubricant in pastes, providing a smooth consistency and helping to hold the other components together.

Zinc oxide: A compound used for its skin-protecting and healing properties, often used in ointments for treating skin conditions.

The combination of these three ingredients helps in creating a paste that has applications in topical treatments for certain skin conditions and as a component in formulations requiring its specific properties.

Quick Tip

The components of compound aluminium paste are specifically chosen for their therapeutic properties in pharmaceutical applications, particularly in ointments and creams.

---

10. Bulk laxative may cause

(1) Flatulence

(2) Gripping pain

(3) Leakage from rectum

(4) Interfere with salt and water balance

Correct Answer: (4) Interfere with salt and water balance

Solution: Bulk laxatives are used to treat constipation by increasing the bulk of stool and stimulating bowel movements. However, excessive use of bulk laxatives can lead to certain side effects:

Interfering with salt and water balance: Bulk laxatives work by absorbing water into the stool to soften it. However, they can also interfere with the balance of electrolytes, such as sodium and potassium, and disrupt the normal water balance in the body. This can result in

dehydration, which can be dangerous, particularly for those with pre-existing medical conditions.

Flatulence and gripping pain are also common side effects due to the increased bowel activity, but the more serious concern is the imbalance of salts and water.

Leakage from rectum is a rarer side effect that may occur if the stool becomes too soft and uncontrollable.

For these reasons, bulk laxatives should be used under medical supervision, especially for long-term use.

Quick Tip

To prevent complications, bulk laxatives should be used in moderation and with adequate hydration. Always consult a doctor if you're unsure about the proper dosage or duration.

---

11. Stokes Einstein equation describing diffusivity (D) and viscosity (η) is:

(1) $D = \frac{k \cdot T}{6 \cdot \pi \cdot \eta \cdot r}$

(2) $D = \frac{k \cdot \pi \cdot T}{6 \cdot \eta \cdot r}$

(3) $D = \frac{k \cdot r \cdot T}{6 \cdot \eta \cdot \pi}$

(4) $D = \frac{k \cdot r}{6 \cdot \eta \cdot \pi \cdot T}$

Correct Answer: (1) $D = \frac{k \cdot T}{6 \cdot \pi \cdot \eta \cdot r}$

Solution: The Stokes-Einstein equation is given by:

$$D = \frac{k \cdot T}{6 \cdot \pi \cdot \eta \cdot r}$$

Where:

D = Diffusivity

k = Boltzmann constant

T = Absolute temperature

η = Viscosity of the medium

r = Radius of the particle

This equation shows the inverse relationship between diffusivity and particle size/viscosity,

meaning smaller particles in less viscous fluids have higher diffusivity.

Quick Tip

Increased viscosity or particle size leads to decreased diffusivity in the medium.

---

12. Thiol, Thioethers, Nitrites containing drugs are primarily susceptible to:

(1) Oxidation

(2) Hydrolysis

(3) Reduction

(4) Cyclization

Correct Answer: (1) Oxidation

Solution: Thiol, thioethers, and nitrites are highly prone to oxidation due to their sulfur-containing functional groups. These groups readily interact with oxygen or other oxidizing agents, forming disulfides or oxidized sulfur derivatives.

To prevent oxidation, antioxidants or stabilizing agents are often added to pharmaceutical formulations containing these functional groups.

Quick Tip

Drugs with thiol and sulfur-based groups should be stored in airtight, light-protected containers to prevent oxidation.

---

13. Very slightly soluble means _____ parts of solvent required for 1 part of solute:

(1) From 100 to 1000

(2) From 1000 to 10000

(3) From 30 to 100

(4) 10000 and over

Correct Answer: (2) From 1000 to 10000

Solution: According to USP (United States Pharmacopeia) solubility definitions, a substance categorized as very slightly soluble requires 1000 to 10000 parts of solvent to dissolve one part of solute.

$$\text{Very slightly soluble} \quad \Rightarrow \quad 1000 \text{ to } 10000 \text{ parts of solvent per 1 part solute}$$

Quick Tip

Remember USP solubility classes:

Freely soluble: Less than 1 part solvent

Soluble: 10-30 parts solvent

Very slightly soluble: 1000-10000 parts solvent

---

14. Sodium salt of polycarboxymethyl ether of cellulose is also known as:

(1) AVICEL

(2) AVICEL PH101

(3) Polycarbapol sodium

(4) CMC Sodium

Correct Answer: (4) CMC Sodium

Solution: Carboxymethyl cellulose sodium (CMC Sodium) is a sodium salt derivative of cellulose that is used as a stabilizer, thickener, and suspending agent in pharmaceutical formulations.

It is widely used for its excellent water-retaining properties and is commonly found in oral suspensions, tablets, and topical formulations.

Quick Tip

CMC Sodium is also referred to as sodium carboxymethyl cellulose in pharmaceutical excipient references.

---

15. Sun protection factor is defined as:

(1) The ratio between UV exposure required to produce a minimally perceptible erythema on unprotected skin and the exposure that will produce the same erythema in protected skin

(2) The ratio between UV exposure required to produce a minimally perceptible erythema on protected skin and the exposure that will produce the same erythema in unprotected skin

(3) The ratio between UV exposure required to produce a maximum perceptible erythema on protected skin and the exposure that will produce the same erythema in unprotected skin

(4) The ratio between UV exposure required to produce a maximum perceptible erythema on unprotected skin and the exposure that will produce the same erythema in protected skin

Correct Answer: (1) The ratio between UV exposure required to produce a minimally perceptible erythema on unprotected skin and the exposure that will produce the same erythema in protected skin

Solution: Sun Protection Factor (SPF) is defined as:

$$SPF = \frac{\text{UV exposure required to produce minimal erythema on protected skin}}{\text{UV exposure required to produce minimal erythema on unprotected skin}}$$

For example, an SPF of 30 means you can be exposed to 30 times more UV radiation before developing erythema compared to unprotected skin. SPF is crucial in determining the effectiveness of sunscreens in blocking UV rays.

Quick Tip

SPF only measures protection against UVB rays (not UVA). A broad-spectrum sunscreen protects against both UVA and UVB rays.

---

16. Choose the correct statement regarding Heckel plot from the following:

(1) It is plotted between Log (porosity)$^{-}1$ against Compressional force

(2) It is plotted between Log (porosity) against Compressional force

(3) It is plotted between Porosity$^{-}1$ against Log (Compressional force)

(4) It is plotted between Porosity against Log (Compressional force)$^{-}1$

Correct Answer: (4) It is plotted between Porosity against Log (Compressional force)$^{-}1$

Solution: The Heckel plot is used in pharmaceutical sciences to study the compression behavior of powders. The correct plot for the Heckel equation is typically a plot of porosity versus the logarithm of compressional force. This plot helps in identifying the compressibility and compactability of powder materials.

Porosity refers to the void space in a powder mass, and compressional force is applied during the compaction of the powder into tablets.

The Heckel plot typically uses logarithmic scale for compressional force to depict the relationship between porosity and force, which is represented as a straight line in the case of ideal compression.

Quick Tip

Heckel plots are widely used in the study of tablet formulation and the characterization of powder compaction behavior. Make sure to use the correct axes when plotting for accurate results.

---

17. Choose the correct sequence of parts of aerosol bottle valve from top:

(A).Stem

(B). Ferrule

(C). Valve seat

(D). Mounting gasket

Choose the correct answer from the options given below

(1) (A), (B), (C), (D)

(2) (A), (B), (D), (C)

(3) (B), (A), (C), (D)

(4) (C), (B), (D), (A)

Correct Answer: (1) (A), (B), (C), (D)

Solution: The correct sequence of parts in an aerosol bottle valve is as follows:

(A) Stem: This is the central component of the valve, through which the content is dispensed.

(B) Ferrule: This is the part that holds the valve assembly in place and connects it to the bottle.

(C) Valve seat: It is the part of the valve mechanism that ensures the seal is formed and

prevents leakage.

(D) Mounting gasket: This part ensures a tight seal between the valve and the bottle, preventing any leakage of the aerosol content.

Hence, the sequence is (A), (B), (C), (D).

Quick Tip

In aerosol valve construction, it is important to ensure a tight seal to avoid leakage and ensure proper functioning of the valve.

---

18. What is the correct order of increasing HLB?

(A). w/o emulsifying agent

(B). o/w emulsifying agent

(C). wetting agent

(D). solubilizing agent

Choose the correct answer from the options given below

(1) (A), (B), (C), (D)

(2) (A), (C), (B), (D)

(3) (B), (A), (D), (C)

(4) (C), (B), (D), (A)

Correct Answer: (2) (A), (C), (B), (D)

Solution: The Hydrophilic-Lipophilic Balance (HLB) is a measure of the balance between the water-loving (hydrophilic) and oil-loving (lipophilic) parts of an emulsifier. The correct order of increasing HLB for the given agents is:

(A) w/o emulsifying agent: These agents have a lower HLB and are more oil-soluble.

(C) Wetting agent: These agents have a moderate HLB and tend to work better in wetting solid particles.

(B) o/w emulsifying agent: These agents have a higher HLB and are more water-soluble.

(D) Solubilizing agent: These agents have the highest HLB and are used to dissolve lipophilic substances in water.

Thus, the correct order is (A), (C), (B), (D).

Quick Tip

HLB values help in selecting the right emulsifiers for different formulations. Emulsifiers with a higher HLB are better for water-based systems, while those with a lower HLB work better with oil-based systems.

---

19. Choose the correct sequence in the development of a drug candidate:

(A) Bioavailability

(B) Physical characterization

(C) Process development

(D) Molecular optimization

(1) (A), (B), (C), (D)

(2) (A), (B), (D), (C)

(3) (D), (B), (C), (A)

(4) (C), (B), (D), (A)

Correct Answer: (1) (A), (B), (C), (D)

Solution: The correct sequence in the development of a drug candidate follows this order:

(A) Bioavailability: This is the first step where the drug's ability to reach the systemic circulation is evaluated.

(B) Physical characterization: The physical properties of the drug, such as solubility, stability, and particle size, are analyzed.

(C) Process development: In this stage, the manufacturing processes for the drug are developed and optimized.

(D) Molecular optimization: This is the final stage where the chemical structure of the drug is modified to improve its effectiveness, stability, and safety.

Hence, the sequence is (A), (B), (C), (D).

Quick Tip

The development of a drug candidate is a long and complex process, involving multiple stages of testing and optimization to ensure safety and efficacy.

20. What are the facts about sterile products from the following:

(A) Complete drug bioavailability occurs in i.v. injections.

(B) Polyethylene glycol (LMW) can be used as vehicles in injections.

(C) Irrigating solutions are required to have similar standards as parenteral solutions.

(D) Ophthalmic products are external products.

Choose the correct answer from the options given below

(1) (A), (B), and (D) only

(2) (A), (B), and (C) only

(3) (A), (B), (C), and (D)

(4) (B), (C), and (D) only

Correct Answer: (3) (A), (B), (C), and (D)

Solution: The correct facts about sterile products are as follows: (A) Complete drug bioavailability occurs in intravenous (i.v.) injections because the drug is directly introduced into the bloodstream, bypassing absorption barriers.

(B) Polyethylene glycol (LMW) can be used as vehicles in injections. This substance is commonly used as a stabilizer or carrier in injectable formulations.

(C) Irrigating solutions required to have similar standards as parenteral solutions. This ensures that they are free from contaminants and suitable for use in medical procedures.

(D) Ophthalmic products are external products, meaning they are used externally and not injected, but they must be sterile and free of microorganisms.

Thus, all the statements are correct, making option (3) the correct answer.

Quick Tip

Sterile products, especially injectable and ophthalmic solutions, require rigorous quality control to ensure they are free from contamination and safe for use.

---

21. Microencapsulation can help in:

(A) Injectables of islets of Langerhans

(B) Lotion of Methyl salicylate - Menthol mixture

(C) Capsule of potassium chloride

(D) Solution of Vitamin A palmitate

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only

(2) (A), (B) and (C) only

(3) (A), (B), (C) and (D)

(4) (B), (C) and (D) only

Correct Answer: (3) (A), (B), (C), and (D)

Solution: Microencapsulation is a technique that allows active ingredients to be enclosed within microscopic capsules. This technology can be used effectively in:

(A) Injectables of islets of Langerhans – Microencapsulation provides controlled release and protection for sensitive biologics.

(B) Lotion of Methyl salicylate - Menthol mixture – Microencapsulation stabilizes volatile oils and enhances their delivery.

(C) Capsule of potassium chloride – Microencapsulation offers controlled and sustained release.

(D) Solution of Vitamin A palmitate – Vitamin A is susceptible to oxidation, and microencapsulation ensures stability.

Quick Tip

Microencapsulation is widely used in pharmaceuticals, cosmetics, and food industries to enhance stability, control release, and mask odors.

---

22. In relation to paper as packaging material, choose the correct statement(s):

(A) It is moisture sensitive

(B) It has cushion property to protect the primary package

(C) It has the ability to create deadfolds

(D) It is non-recyclable

Choose the correct answer from the options given below:

(1) (A), (B) and (D) only

(2) (A), (B) and (C) only

(3) (A), (B), (C) and (D)

(4) (B), (C) and (D) only

Correct Answer: (2) (A), (B) and (C) only

Solution: Paper as a packaging material has the following characteristics:

(A) It is moisture sensitive, meaning it can degrade or deform in high humidity conditions.

(B) It provides cushioning properties, especially when layered, protecting delicate items inside.

(C) Paper has the ability to create deadfolds, which are creases or folds that hold their shape without springing back.

(D) However, paper is recyclable, not non-recyclable, making option (D) incorrect.

Quick Tip

Paper packaging is eco-friendly but requires protective coatings for improved durability in moisture-prone environments.

---

23. Match List-I with List-II

List-I	List-II
Plastic additives	Role
(A). Talc	(I). Reduce static accumulation
(B). Cresol	(II). Give a whiter then whiter appearance
(C). Ultramarine	(III). Retard oxidation
(D). Surfactant	(IV). reduce plastic degradation

Choose the **correct** answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

Talc — Reduces static accumulation.

Cresol — Enhances whiteness.

Ultramarine — Retards oxidation by providing UV protection.

Surfactant — Reduces plastic degradation by improving flexibility and stabilizing polymer chains.

Quick Tip

Plastic additives enhance material properties, providing stability, flexibility, and improved visual appeal.

---

24. Match List-I with List-II

List-I	List-II
Renal clearance (ml/min)	Drug
(A). 650	(I). Iodopyracet
(B). 130	(II). Inulin
(C). <130	(III). Lipophillic drugs
(D). 0	(IV). Glucose

Choose the correct answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution: 650 ml/min — Iodopyracet (high clearance).

130 ml/min — Inulin (ideal reference marker for GFR).

<130 ml/min — Lipophilic drugs (low renal clearance).

0 ml/min — Glucose (completely reabsorbed by renal tubules).

Quick Tip

Inulin is the gold standard for measuring glomerular filtration rate (GFR) in renal function tests.

---

25. Match List-I with List-II

List-I	List-II
Metabolic pathway	Example
(A). Aromatic hydroxylation	(I). Valproic acid
(B). Oxidation of olefines	(II). Tolbutamide
(C). Oxidation of Benzylic carbon atom	(III). Carbamazepine
(D). Aliphatic hydroxylation	(IV). Arenes

Choose the **correct** answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

(3) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

(4) (A) - (IV), (B) - (II), (C) - (I), (D) - (III)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution:

Aromatic hydroxylation — Valproic acid.

Oxidation of olefins — Tolbutamide.

Oxidation of benzylic carbon atom — Carbamazepine.

Aliphatic hydroxylation — Arenes.

Quick Tip

Metabolic pathways determine drug elimination, influencing pharmacokinetics and toxicity.

---

26. Match List-I with List-II

List-I	List-II
Protein	Bound drug
(A). HSA	(I). Cupric ion
(B). AAG	(II). Chlorpromazine
(C). Lipoprotein	(III). Quinidine
(D). Alpha 2 Globulin	(IV). Large varieties of drugs

Choose the correct answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (III), (C) - (III), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution: HSA (Human Serum Albumin): It primarily binds with Cupric ion (I), an essential metal ion in the body. AAG (Alpha-1 Acid Glycoprotein): This binds with Chlorpromazine (II), which is a drug used for various psychiatric disorders.

Lipoprotein: Lipoproteins typically bind to Quinidine (III), an antiarrhythmic drug used to treat heart conditions.

Alpha 2 Globulin: This binds with a Large variety of drugs (IV), typically serving as a carrier protein for various drugs in the bloodstream.

Thus, the correct answer is (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV).

Quick Tip

Understanding protein-drug binding is crucial for pharmacokinetics, as it helps in predicting the drug's distribution, half-life, and therapeutic effects.

---

27. The intermediate formed in pinacole-pinacolone rearrangement is

(1) Carbanion

(2) Carbocation

(3) Free radical

(4) Carbene

Correct Answer: (2) Carbocation

Solution: In the pinacole-pinacolone rearrangement, a carbocation intermediate is formed. The reaction proceeds as follows:

1. Pinacole undergoes dehydration, forming a carbocation intermediate.

2. This carbocation is stabilized and undergoes rearrangement to form pinacolone. The mechanism involves the migration of a methyl group to stabilize the carbocation formed.

Thus, the intermediate formed is a carbocation.

Quick Tip

The pinacole-pinacolone rearrangement is an example of a reaction involving a carbocation intermediate, which is a key concept in organic chemistry.

---

28. Which of the following parameter/s of the analyte is measured in polarography?

(1) Voltage (Potential)

(2) Current

(3) Mass - transport limiting current

(4) Coulombs

Correct Answer: (2) Current

Solution: In polarography, the primary parameter that is measured is the current. This

technique is used to measure the current as a function of applied voltage, which allows the determination of the concentration of ions in solution.

Voltage is applied to the system, but it is the current that is measured and used to analyze the concentration of analytes in solution.

The current measured is related to the mass-transport limiting current, which provides insight into the analyte's concentration.

Thus, the correct answer is Current.

Quick Tip

Polarography is an electrochemical technique where the current-voltage relationship is used to determine the concentration of analytes.

---

29. Which of the following radionuclides has the lowest half-life?

(1) Gallium-67

(2) Indium-111

(3) Xenon-133

(4) Technetium-99m

Correct Answer: (3) Xenon-133

Solution: Radionuclides are commonly used in medical imaging, and their half-lives vary.

The half-lives of the given radionuclides are as follows:

Gallium-67: Half-life = 78 hours

Indium-111: Half-life = 67.3 hours

Xenon-133: Half-life = 5.3 days

Technetium-99m: Half-life = 6 hours

Among these, Xenon-133 has the lowest half-life.

Thus, the correct answer is Xenon-133.

Quick Tip

Short half-lives of radionuclides like Xenon-133 are ideal for imaging procedures as they decay quickly and minimize patient exposure to radiation.

30. Which of the following compounds is used as a disease-modifying antirheumatic drug?

(1) Copper

(2) Gold

(3) Silver

(4) Thallium

Correct Answer: (2) Gold

Solution: Disease-modifying antirheumatic drugs (DMARDs) are used to treat conditions like rheumatoid arthritis by slowing disease progression and modifying immune responses.

Among the given options:

Gold is a well-known DMARD used in the treatment of rheumatoid arthritis.

Copper, Silver, and Thallium are not used as DMARDs in standard medical practice.

Thus, the correct answer is Gold.

Quick Tip

Gold salts have been historically used as DMARDs for treating rheumatoid arthritis, although newer medications are now preferred.

---

31. The organic molecules may show optical activity even in the absence of chiral carbon in their structure. Such phenomenon is called as:

(1) Mesomerism

(2) Anisotropic effect

(3) Atropisomerism

(4) Diastereomeric effect

Correct Answer: (3) Atropisomerism

Solution: Atropisomerism refers to a type of stereoisomerism that arises due to restricted rotation about a single bond, often due to steric hindrance.

Unlike typical optical isomerism, atropisomers can exhibit chirality without the presence of a chiral carbon. Such molecules possess distinct spatial arrangements that cannot readily

interconvert, making them optically active.

Example: Biphenyl derivatives with bulky substituents at the ortho positions show atropisomerism due to hindered rotation.

Example compound: 2,2'-Dibromobiphenyl

Quick Tip

Atropisomerism is common in compounds with planar structures that have steric hindrance blocking free rotation.

---

32. International Council for Harmonization of Technical requirements for pharmaceuticals for human provides guidelines that address the chemistry, possible impurities, their level and safety aspects as per ICH Code or their revision

(1) Q1A

(2) Q3A

(3) Q5C

(4) Q6A

Correct Answer: (2) Q3A

Solution: The ICH Q3A guideline deals specifically with:

Identifying impurities in new drug substances.

Determining acceptable impurity levels.

Assessing the safety aspects of impurities in pharmaceuticals.

Key focus areas of ICH Q3A:

Classification of impurities (e.g., organic impurities, inorganic impurities, residual solvents).

Setting impurity limits and providing analytical methods for detection.

$$\text{ICH Q3A Guidelines} \quad \Rightarrow \quad \text{Impurities in New Drug Substances}$$

Quick Tip

ICH Q1 series relates to stability, Q3 series relates to impurities, and Q5 series covers biotechnological products.

---

33. (S)-3-isobutyl-gamma amino butyric acid is:

(1) Gabapentin

(2) Pregabalin

(3) Vigabatrin

(4) Tiagabine

Correct Answer: (2) Pregabalin

Solution: (S)-3-isobutyl-gamma amino butyric acid is the chemical structure of Pregabalin.

Pregabalin is an anticonvulsant and neuropathic pain agent that binds to the 2- subunit of voltage-gated calcium channels in the central nervous system. It is used for:

Treatment of neuropathic pain.

Management of generalized anxiety disorder (GAD).

Adjunctive therapy for partial seizures.

$$\text{Pregabalin} \quad \Rightarrow \quad \text{(S)-3-isobutyl-gamma amino butyric acid}$$

Quick Tip

Gabapentin and Pregabalin share structural similarity with GABA but do not interact directly with GABA receptors.

---

34. The presence of electron-withdrawing groups like chloro or nitro at the C2 position of phenothiazine imparts which activity to the molecule?

(1) Antihistaminic

(2) Antibacterial

(3) Anthelmintic

(4) Antipsychotic

Correct Answer: (2) Antibacterial

Solution: Electron-withdrawing groups (EWG) like chloro (-Cl) and nitro (-NO) at the C2 position of phenothiazine molecules enhance their antibacterial properties.

These groups:

Increase electron density around the phenothiazine nucleus.

Improve cell penetration in bacterial membranes.

Enhance the stability of the compound, contributing to stronger antibacterial action.

Example: Chlorpromazine derivatives are known to possess antibacterial properties in addition to their antipsychotic effects.

Quick Tip

Phenothiazine derivatives are multifunctional, showing antipsychotic, antihistaminic, and antibacterial effects depending on structural modifications.

---

35. Reduction of lactones to lactols can be carried out best with which of the following methods or reagents?

(1) Rosenmund reaction

(2) Clemmensen reduction

(3) Diisobutyl aluminium hydride

(4) Lithium aluminium hydride

Correct Answer: (3) Diisobutyl aluminium hydride

Solution: Diisobutyl aluminium hydride (DIBAL-H) is the best reagent for reducing lactones to lactols.

DIBAL-H selectively reduces esters, lactones, and nitriles to their corresponding alcohol or lactol forms.

It operates efficiently under mild conditions with controlled temperature.

Reaction Mechanism:

$$\text{Lactone} \xrightarrow{DIBAL-H} \text{Lactol}$$

In contrast:

Rosenmund Reaction reduces acyl chlorides to aldehydes.

Clemmensen Reduction reduces ketones or aldehydes to hydrocarbons.

Lithium aluminium hydride (LAH) is stronger but may over-reduce the lactone to a complete alcohol.

Quick Tip

DIBAL-H is preferred for selective reduction of esters and lactones to aldehydes or lactols with minimal side reactions.

---

36. Sodium is one of the major electrolytes in the human body. It is present in higher concentration in which compartment?

(1) Intracellular

(2) Extracellular

(3) Depending on the type of cell either extracellular or intracellular compartment

(4) Cytoplasmic membrane

Correct Answer: (2) Extracellular

Solution: Sodium (Na^+) is one of the key electrolytes in the human body and plays a crucial role in maintaining fluid balance, nerve function, and muscle contraction. The distribution of sodium is different between the two primary compartments in the body: intracellular and extracellular.

Extracellular fluid contains significantly higher concentrations of sodium compared to intracellular fluid.

The sodium concentration in the extracellular space is approximately 140 mM, while the intracellular concentration is much lower, around 10-15 mM.

The high extracellular concentration of sodium is maintained by the sodium-potassium pump (Na^+-K^+ ATPase), which actively pumps sodium out of the cell and potassium into the cell.

Thus, sodium is present in higher concentration in the extracellular compartment.

Quick Tip

The concentration gradient of sodium is critical for many physiological processes, including nerve impulse transmission and muscle contraction.

---

37. What is the term used to signify the concordance of a series of measurements of the same activity?

(1) Accuracy

(2) Precision

(3) Absolute accuracy

(4) Fidelity

Correct Answer: (2) Precision

Solution: In scientific measurements, the terms accuracy and precision are often used to describe the quality of measurements:

Accuracy refers to how close a measured value is to the true or accepted value.

Precision refers to the consistency or reproducibility of measurements when the same activity is measured repeatedly.

For example, if you measure the same parameter multiple times and get similar results, the measurements are precise.

Absolute accuracy is not a commonly used term in measurement science; it can be confused with accuracy, but it's not a standard concept.

Fidelity generally refers to the faithfulness or exactness of a representation, but it is not commonly used in the context of measurement precision.

Therefore, the correct term to signify the concordance of a series of measurements of the same activity is precision.

Quick Tip

To improve precision, reduce random errors and use proper equipment calibration and technique.

---

38. Nitrobenzene can be used as a solvent for Friedel-Crafts reaction because:

(1) Nitrobenzene is an apolar protic solvent

(2) Nitrobenzene competes with substrate for acyl electrophile and speeds up the rate of reaction

(3) Nitro group in nitrobenzene deactivates the ring making it inert to Friedel-Crafts acylation

(4) Nitrobenzene stabilizes acylium cation which is an electrophile for the reaction

Correct Answer: (4) Nitrobenzene stabilizes acylium cation which is an electrophile for the reaction

Solution: In the Friedel-Crafts acylation reaction, an acyl group is added to an aromatic ring, typically using an acyl chloride and a Lewis acid catalyst. Nitrobenzene is often used as a solvent for this reaction due to the following reason:

Nitrobenzene is a polar aprotic solvent that does not interfere with the electrophilic nature of the reaction.

The nitro group on the benzene ring is electron-withdrawing, which means it deactivates the ring toward electrophilic substitution, but it also stabilizes the acylium cation (which is the electrophile in the reaction).

The stabilization of the acylium cation enhances the electrophilic attack on the aromatic ring, making the reaction proceed more smoothly.

Thus, nitrobenzene stabilizes the acylium cation, which is crucial for the Friedel-Crafts acylation.

Quick Tip

In Friedel-Crafts reactions, solvents like nitrobenzene are used to stabilize the reactive intermediates and improve the reaction efficiency.

---

39. What is the correct sequence of activation reactions in the blood coagulation cascade?

(A) Conversion of prothrombin to thrombin

(B) Activation of fibrinogen to fibrin

(C) Activation of Factor X to Xa

(D) Appearance of tissue factor

Choose the **correct** answer from the options given below:

(1) (A), (D), (C), (B)

(2) (D), (C), (A), (B)

(3) (D), (B), (C), (A)

(4) (D), (A), (B), (C)

Correct Answer: (2) (D), (C), (A), (B)

Solution: The correct sequence of activation reactions in the blood coagulation cascade is:

Appearance of tissue factor initiates the extrinsic pathway, triggering the cascade.

Next, tissue factor activates Factor VII, which in turn activates Factor X to Xa.

Factor Xa then converts prothrombin (Factor II) into thrombin.

Finally, thrombin catalyzes the conversion of fibrinogen to fibrin, forming a stable clot.

Quick Tip

The extrinsic pathway (initiated by tissue factor) is faster, while the intrinsic pathway amplifies clotting.

---

40. A new Carbon-Carbon bond formation is possible in which of the following reactions?

(A) Cannizzaro's reaction

(B) Friedel-Crafts reaction

(C) Reimer-Tiemann reaction

(D) Clemmensen's reduction

Choose the **correct** answer from the options given below:

(1) (A) and (D) only

(2) (A), (B) and (C) only

(3) (B) and (C) only

(4) (C) and (D) only

Correct Answer: (3) (B) and (C) only

Solution: The Friedel-Crafts reaction involves the formation of a new carbon-carbon bond by the alkylation or acylation of aromatic compounds.
The Reimer-Tiemann reaction introduces a formyl (-CHO) group to phenolic compounds, forming a new carbon-carbon bond.
Cannizzaro's reaction and Clemmensen's reduction do not involve new carbon-carbon bond formation.

Quick Tip

Friedel-Crafts and Reimer-Tiemann reactions are key methods for extending carbon chains in organic synthesis.

---

41. Arrange the following steroidal molecules in the sequence of increasing number of carbon atoms (From lowest to highest):

(A) Estrane

(B) Cholestane

(C) Gonane

(D) Androstane

Choose the **correct** answer from the options given below:

(1) (C), (A), (D), (B)

(2) (B), (A), (C), (D)

(3) (B), (C), (D), (A)

(4) (B), (C), (A), (D)

Correct Answer: (1) (C), (A), (D), (B)

Solution: The correct order of steroid molecules in increasing carbon number is:

Gonane has 17 carbon atoms.

Estrane has 18 carbon atoms.

Androstane has 19 carbon atoms.

Cholestane has 27 carbon atoms.

Order: $Gonane < Estrane < Androstane < Cholestane$

Quick Tip

Steroid structures are categorized based on their carbon skeleton and functional groups.

---

42. In biosynthesis of prostaglandins, what is the sequence of biochemical events for the steps involved?

(A) Formation of PGA2

(B) Formation of PGG2

(C) Action of phospholipase to release arachidonic acid

(D) Formation of PGH2

Choose the **correct** answer from the options given below:

(1) (C), (D), (A), (B)

(2) (A), (B), (C), (D)

(3) (C), (B), (D), (A)

(4) (C), (A), (B), (D)

Correct Answer: (3) (C), (B), (D), (A)

Solution: The correct sequence of steps in prostaglandin biosynthesis is:

Phospholipase releases arachidonic acid from membrane phospholipids.

Arachidonic acid undergoes oxygenation to form PGG2.

PGG2 is converted to PGH2, a precursor for multiple prostaglandins.

PGH2 is further converted into PGA2 in certain pathways.

Quick Tip

Prostaglandins are key mediators of inflammation, pain, and fever.

---

43. Match List-I of terms used in analysis with List-II of their method of determination

List-I	List-II
Analysis	Method of determination
(A). Organic nitrogen	(I). Complexometric titration
(B). Moisture content	(II). Kjeldhal method
(C). Chemical oxygen demand of sample	(III). Karl Fischer method
(D). Hardness of water	(IV). Redox titration

Choose the **correct** answer from the options given below:

(1) (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

(2) (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

(3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

(4) (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

Correct Answer: (2) (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Solution: Organic nitrogen is determined by the Kjeldahl method.

Moisture content is measured by the Karl Fischer method.

Chemical oxygen demand (COD) is determined via Redox titration.

Hardness of water is determined by Complexometric titration.

Quick Tip

Each method plays a key role in environmental, food, and pharmaceutical analysis.

---

44. Match List-I of reactions with List-II of reaction type

List-I	List-II
Reaction	Type
(A). Claisen rearrangement	(I). E2 mechanism
(B). Hoffman degradation	(II). Aromatic electrophilic substitution
(C). Kolbe reaction	(III). Aromatic nucleophilic substitution
(D). m--Bromoanisole to m-anisidine	(IV). Sigmatropic reaction

Choose the **correct** answer from the options given below:

(1) (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

(2) (A) - (I), (B) - (IV), (C) - (III), (D) - (II)

(3) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

(4) (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Correct Answer: (3) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

Solution:

Claisen rearrangement is a sigmatropic reaction (IV), where a molecule undergoes rearrangement with the migration of a sigma bond.

Hoffman degradation is an aromatic nucleophilic substitution (III), where an amide is degraded to an amine and a carboxylate ion.

Kolbe reaction is an aromatic electrophilic substitution (II), where a carboxylate anion reacts with an electrophile in the presence of a suitable catalyst to form an aryl compound.

m-Bromoanisole to m-anisidine is an E2 mechanism (I), where an elimination occurs in a bimolecular manner, resulting in the formation of a new compound.

Thus, the correct matching is (A) - (IV), (B) - (III), (C) - (II), (D) - (I).

Quick Tip

In organic chemistry, the classification of reactions is essential for understanding their mechanisms and predicting the products formed. Identifying the correct type of reaction is key to mastering reaction mechanisms.

---

45. Match List-I of antidiabetic drugs with List-II of their molecular target for action

List-I	List-II
Antidiabetic drug	Molecular target for action
(A). Dapagliflozin	(I). ATP sensitive Potassium channel, inhibition
(B). Repaglinide	(II).PPAR gamma and alpha receptor, dual agonist
(C). Rosiglitazone	(III). SGLT2, inhibition
(D). Rapaglitazar	(IV).PPAR gamma receptor, agonist

Choose the **correct** answer from the options given below:

(1) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

(2) (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

Correct Answer: (2) (A) - (III), (B) - (I), (C) - (II), (D) - (IV)

Solution:

Dapagliflozin works by inhibiting SGLT2 (III), a sodium-glucose transporter, which reduces glucose reabsorption in the kidneys.

Repaglinide targets the ATP-sensitive potassium channel (I), regulating insulin release from the pancreas.

Rosiglitazone acts as a PPAR gamma and alpha receptor, dual agonist (II), improving insulin sensitivity.

Rapaglitazar works as a PPAR gamma receptor agonist (IV), influencing insulin sensitivity and fat metabolism.

Thus, the correct matching is (A) - (III), (B) - (I), (C) - (II), (D) - (IV).

Quick Tip

Understanding the molecular target for each antidiabetic drug is crucial for determining its mechanism of action and clinical use.

---

46. In the sarcomere, the Z line:

(1) Is the boundary between adjacent sarcomeres

(2) Runs down the center of each sarcomere

(3) Gives attachment to myosin filaments

(4) Stores calcium

Correct Answer: (1) Is the boundary between adjacent sarcomeres

Solution: The Z line in a sarcomere is a key structural component of muscle fibers.

It marks the boundary between two adjacent sarcomeres, the repeating structural units of muscle contraction.

The Z line anchors the actin filaments, which are part of the contractile machinery in muscle cells.

The calcium storage is handled by the sarcoplasmic reticulum, not the Z line.

The myosin filaments are attached to the M line, not the Z line.

Thus, the correct answer is that the Z line is the boundary between adjacent sarcomeres.

Quick Tip

Understanding the structural organization of a sarcomere is essential for comprehending how muscles contract and generate force.

---

47. Which one of the following eicosanoids is synthesized from linoleic acid via cyclooxygenase pathway?

(1) PGE_1

(2) LTA_3

(3) TXA_3

(4) LTB_5

Correct Answer: (4) LTB_5

Solution: Eicosanoids are signaling molecules derived from fatty acids. The key fatty acid involved in their synthesis is arachidonic acid, which is derived from linoleic acid.

The cyclooxygenase pathway (COX) leads to the production of prostaglandins (PGE_1) and thromboxanes (TXA_3).

LTB_5 is a leukotriene derived from linoleic acid and is a key product of the lipoxygenase pathway.

The other options (PGE_1, LTA_3, and TXA_3) are products of different pathways but not directly from linoleic acid via cyclooxygenase.

Thus, LTB_5 is the correct eicosanoid synthesized from linoleic acid via the cyclooxygenase pathway.

Quick Tip

Cyclooxygenase and lipoxygenase pathways play essential roles in inflammation and immune responses by producing different eicosanoids from fatty acids.

---

48. Linitis plastica is a form of:____

(1) Chronic atrophic gastritis

(2) Achalasia cardia

(3) Gastric carcinoma

(4) Peptic ulcer

Correct Answer: (3) Gastric carcinoma

Solution: Linitis plastica is a type of gastric carcinoma characterized by thickening of the stomach wall due to cancer infiltration.

It is a rare and aggressive form of cancer that results in a rigid, non-distensible stomach, hence the name ”plastic” meaning hard or non-elastic.

Chronic atrophic gastritis and achalasia cardia are different conditions that affect the stomach or esophagus but are not related to the pathophysiology of linitis plastica.

Peptic ulcer refers to the erosion of the stomach lining, not a cancerous growth.

Thus, the correct answer is gastric carcinoma.

Quick Tip

Early detection of gastric carcinoma, including linitis plastica, is crucial for improving prognosis and treatment outcomes.

---

49. ___Drug used in the treatment of glaucoma by increasing trabecular outflow of aqueous humour:

(1) Timolol

(2) Apraclonidine

(3) Pilocarpine

(4) Brinzolamide

Correct Answer: (3) Pilocarpine

Solution: Pilocarpine is a muscarinic agonist that acts by stimulating the muscarinic receptors on the ciliary muscle.

Contraction of the ciliary muscle opens the trabecular meshwork, facilitating the outflow of aqueous humour through the Schlemm's canal.

This mechanism effectively reduces intraocular pressure (IOP) in glaucoma patients.

Pilocarpine is especially useful in acute angle-closure glaucoma due to its rapid action.

In contrast:

Timolol is a beta-blocker that reduces aqueous humour production.

Apraclonidine is an alpha-2 agonist that also decreases aqueous humour production.

Brinzolamide is a carbonic anhydrase inhibitor that reduces IOP by decreasing aqueous humour production.

Quick Tip

Pilocarpine is preferred in emergency glaucoma situations due to its ability to rapidly improve trabecular outflow.

---

50. ____ IS Synthetic progestin with weak oestrogenic, weak androgenic, anabolic, and poor antiovulatory action:

(1) Dimethisterone

(2) Norethindrone

(3) Lynestrenol

(4) Norgestrel

Correct Answer: (1) Dimethisterone

Solution: Dimethisterone is a synthetic progestin known for its weak oestrogenic, weak

androgenic, anabolic, and poor antiovulatory effects.

It is mainly used for hormone replacement therapy (HRT) and in conditions requiring minimal antiovulatory action.

In contrast:

Norethindrone and Lynestrenol have stronger progestational and antiovulatory properties.

Norgestrel is a potent progestin with minimal estrogenic activity but stronger antiovulatory action.

Quick Tip

Dimethisterone is less commonly used for contraception due to its poor antiovulatory effect.

---

51. ____ Compounds/drugs that are both blood schizontocide and gametocide:

(1) Artemisinin

(2) Proguanil

(3) Cinchona

(4) Tafenoquine

Correct Answer: (4) Tafenoquine

Solution: Tafenoquine is a unique antimalarial drug that acts as both a blood schizonticide (active against erythrocytic stages) and a gametocide (targeting sexual stages of Plasmodium species).

It is particularly effective in treating Plasmodium vivax infections and preventing relapse by targeting liver hypnozoites.

In contrast:

Artemisinin is highly effective as a blood schizonticide but lacks gametocidal action.

Proguanil is a prophylactic agent that works primarily as a blood schizontocide.

Cinchona alkaloids are mainly effective against blood-stage parasites with limited gametocidal action.

Quick Tip

Tafenoquine is ideal for radical cure and relapse prevention in Plasmodium vivax malaria.

---

52. Mucosal damage is more common with imidazoline alpha-2 receptor agonists than phenylephrine because of:

(1) Alpha 1 mediated vasoconstriction in arterioles

(2) Alpha 2 mediated vasodilation in venous vessels

(3) Alpha 2 mediated vasoconstriction in arterioles

(4) Alpha 1 mediated vasodilation in arterioles

Correct Answer: (3) Alpha 2 mediated vasoconstriction in arterioles

Solution: Imidazoline alpha-2 receptor agonists induce vasoconstriction by activating alpha-2 receptors in the arterioles.

This leads to prolonged vasoconstriction, reducing blood supply and causing mucosal ischemia and damage.

In contrast, Phenylephrine acts primarily on alpha-1 receptors, which cause vasoconstriction but are less aggressive than alpha-2 receptor-mediated responses.

Quick Tip

Alpha-2 receptor agonists like Clonidine and Brimonidine are more likely to cause mucosal irritation compared to phenylephrine.

---

53. The timing of administration of the evening dose of insulin is important because of ___ phenomenon.

(1) Somogyi

(2) Dales

(3) Insulin resistance

(4) Dawn

Correct Answer: (4) Dawn

Solution: The Dawn phenomenon refers to an early morning rise in blood glucose levels due to increased secretion of growth hormone, cortisol, and catecholamines during the night.

To counteract this, the timing of the evening dose of insulin is crucial.

Delaying the evening dose or adjusting basal insulin can help prevent the glucose spike.

In contrast:

Somogyi phenomenon refers to rebound hyperglycemia following nocturnal hypoglycemia.

Insulin resistance occurs due to impaired insulin receptor sensitivity, often in diabetic patients.

Quick Tip

Adjusting the timing of insulin or switching to longer-acting formulations can effectively manage the Dawn phenomenon.

---

54. A 65-year-old man suffers a myocardial infarction and is given tissue plasminogen activator within 6 hours of onset of the thrombosis to achieve one of the following:

(1) Prevent activation of extrinsic pathway of coagulation

(2) Inhibit thrombin

(3) Enhance degradation of factors VIIIa and Va

(4) Enhance fibrinolysis

Correct Answer: (4) Enhance fibrinolysis

Solution: Tissue plasminogen activator (tPA) is a thrombolytic agent used to dissolve blood clots. It works by enhancing fibrinolysis, which is the process of breaking down fibrin in blood clots.

tPA activates plasminogen to plasmin, which then degrades fibrin, thus enhancing the process of fibrinolysis.

The other options are not the primary mechanisms of tPA:

Option (1): tPA does not directly prevent activation of the extrinsic pathway of coagulation.

Option (2): tPA does not inhibit thrombin, but rather promotes fibrinolysis.

Option (3): While tPA indirectly affects factor VIIIa and Va degradation, it is not its primary mechanism of action.

Thus, the correct answer is Enhance fibrinolysis.

Quick Tip

Tissue plasminogen activators (tPA) are effective in treating acute myocardial infarction and ischemic stroke by enhancing fibrinolysis and breaking down blood clots.

---

55. Which type of substrate is required for glucuronidation?

(1) Phenols

(2) Epoxide

(3) Arene oxides

(4) Alkene oxides

Correct Answer: (1) Phenols

Solution: Glucuronidation is a phase II metabolic reaction that involves the attachment of glucuronic acid to a substrate, typically to make the compound more water-soluble and facilitate excretion.

Phenols are the most common substrates for glucuronidation, where the glucuronic acid attaches to the hydroxyl group of the phenolic compound.

Epoxides, arene oxides, and alkene oxides are less commonly involved in glucuronidation, although they can undergo other metabolic pathways such as conjugation with glutathione or other reactions.

Thus, the correct answer is Phenols.

Quick Tip

Glucuronidation is an important detoxification pathway that makes many lipophilic compounds, including drugs and toxins, more hydrophilic for excretion.

---

56. A nonvolatile, highly lipid-soluble drug is metabolized at a rate of 15% per hour. On intravenous injection, it produces general anesthesia for 10 minutes. Which process is responsible for termination of its action?

(1) Metabolism in liver

(2) Plasma protein binding

(3) Excretion

(4) Redistribution

Correct Answer: (4) Redistribution

Solution: For lipid-soluble drugs, the primary mechanism responsible for the termination of their action, especially when they produce general anesthesia, is redistribution.

Initially, the drug is administered intravenously and rapidly distributed to the highly perfused organs (brain, heart, liver).

As the concentration of the drug decreases in the blood, it redistributes from the brain to less perfused tissues such as fat and muscle, reducing its effect.

Metabolism in the liver occurs, but it is slower compared to redistribution, which is the primary process for terminating anesthesia.

Plasma protein binding and excretion do not play a major role in the rapid termination of action in this case.

Thus, the correct answer is Redistribution.

Quick Tip

The rapid termination of general anesthesia with lipid-soluble drugs is mainly due to redistribution rather than metabolism or excretion.

---

57. Down regulation of receptors can occur as a consequence of

(1) Continuous use of agonist

(2) Continuous use of antagonist

(3) Chronic use of CNS depressants

(4) Denervation

Correct Answer: (1) Continuous use of agonist

Solution: Receptor downregulation refers to a decrease in the number or sensitivity of

receptors in response to prolonged exposure to a stimulus.

Continuous use of an agonist results in receptor downregulation because constant stimulation of the receptor by the agonist leads to the internalization or desensitization of the receptor.

Continuous use of an antagonist does not typically cause downregulation, as antagonists block receptor activity without stimulating it.

Chronic use of CNS depressants may cause tolerance, but not necessarily downregulation of receptors.

Denervation leads to receptor upregulation as the body compensates for the lack of neural input by increasing receptor numbers.

Thus, the correct answer is Continuous use of agonist.

Quick Tip

Understanding receptor regulation is key in pharmacology, as it affects drug efficacy and the development of tolerance or desensitization.

---

58. Correct sequence of events for purine biosynthesis

(A) Ribose 5-phosphate to Phosphoribosyl pyrophosphate

(B) Aminoimidazole carboxylate ribosyl-5-phosphate

(C) 5-Phospho-ribosylamine to Glycinamide ribosyl-5-phosphate

(D) Formylglycinamide ribosyl-5-phosphate to Formylglycinamidine ribosyl-5-phosphate

Choose the correct answer from the options given below:

(1) (A) - (B) - (C) - (D)

(2) (A) - (C) - (D) - (B)

(3) (B) - (A) - (C) - (D)

(4) (D) - (A) - (C) - (B)

Correct Answer: (1) (A) - (B) - (C) - (D)

Solution: The biosynthesis of purines follows a specific sequence of steps, beginning with the formation of phosphoribosyl pyrophosphate (PRPP) from ribose 5-phosphate.

Step (A): Ribose 5-phosphate is converted into phosphoribosyl pyrophosphate (PRPP),

which is the starting point for purine biosynthesis.

Step (B): Aminoimidazole carboxylate ribosyl-5-phosphate is formed next in the pathway.

Step (C): 5-Phosphoribosylamine is converted into glycinamide ribosyl-5-phosphate, an intermediate in purine synthesis.

Step (D): Finally, formylglycinamide ribosyl-5-phosphate is converted into formylglycinamidine ribosyl-5-phosphate, a step closer to the purine ring formation.

Thus, the correct sequence is (A) - (B) - (C) - (D).

Quick Tip

Purine biosynthesis involves a series of complex steps that are essential for the formation of nucleotides, which are the building blocks of DNA and RNA.

---

59. Pathogenesis of atheromatous plaques by response-to-injury theory. Sequence of events:

(A) T lymphocyte activation

(B) Proliferation, Migration

(C) Endothelial Dysfunction

(D) Form cell formation

Choose the **correct** answer from the options given below:

(1) (D), (C), (A), (B)

(2) (C), (D), (A), (B)

(3) (A), (D), (C), (B)

(4) (B), (A), (C), (D)

Correct Answer: (2) (C), (D), (A), (B)

Solution: The correct sequence for the development of atheromatous plaques as per the response-to-injury theory is as follows:

1. Endothelial Dysfunction (C): Damage to the endothelial lining is the initiating event, often caused by hypertension, smoking, or high cholesterol.

2. Form Cell Formation (D): Damaged endothelium leads to macrophage infiltration and foam cell formation.

3. T Lymphocyte Activation (A): T cells are activated, releasing cytokines that stimulate further inflammatory responses.
4. Proliferation and Migration (B): Smooth muscle cells proliferate and migrate to form the fibrous cap of the atheromatous plaque.

Quick Tip

Managing risk factors like hypertension, hyperlipidemia, and smoking reduces endothelial injury, thus preventing plaque formation.

---

60. Acute subdural hematoma has the following features:

(A) Blood is of venous origin

(B) Accumulated blood is in liquid form

(C) No significant compression of gyri

(D) Symptoms develop slowly

Choose the **correct** answer from the options given below:

(1) (A), (B), and (D) only

(2) (A), (B), and (C) only

(3) (A), (C), and (D) only

(4) (C) and (D) only

Correct Answer: (1) (A), (B), and (D) only

Solution: An acute subdural hematoma has the following characteristics:

Blood is of venous origin (A): The bleeding usually results from the rupture of bridging veins.

Accumulated blood is in liquid form (B): Blood remains in a semi-liquid state, which can be detected on imaging.

Symptoms develop slowly (D): Due to the slower nature of venous bleeding, symptoms may progress over hours to days.

No significant compression of gyri (C) is incorrect. Significant compression may occur with large hematomas.

Quick Tip

Subdural hematoma commonly occurs after head injury, particularly in elderly individuals or alcoholics.

---

61. Effects of nitrates and calcium channel blockers in angina pectoris:

(A) Decrease in heart rate

(B) Decrease in arterial pressure

(C) Increase in end-diastolic volume

(D) Increase in ejection time

Choose the **correct** answer from the options given below:

(1) (A) and (B) only

(2) (A), (B), and (C) only

(3) (A), (B), and (D) only

(4) (B) and (C) only

Correct Answer: (2) (A), (B), and (C) only

Solution: Nitrates and calcium channel blockers exert the following effects in angina pectoris:

Decrease in heart rate (A): Calcium channel blockers reduce heart rate by slowing AV conduction.

Decrease in arterial pressure (B): Both nitrates and calcium channel blockers reduce systemic vascular resistance, lowering blood pressure.

Increase in end-diastolic volume (C): Nitrates reduce preload, which may cause reflex tachycardia and increase end-diastolic volume.

Increase in ejection time (D): This is not a common effect seen with these drugs.

Quick Tip

Calcium channel blockers are preferred in variant angina, while nitrates are effective in stable angina.

62. Pharmacological properties of inhaled anesthetics. Match List— (Anesthetic agents) with List-II (Blood:Gas parition coefficient)

List-I	List-II
Anesthetic agents	Blood:Gas partition coefficient
(A). Nitrous Oxide	(I). 2.30
(B). Sevoflurane	(II). 1.40
(C). Isoflurane	(III). 0.47
(D). Halothane	(IV). 0.69

Choose the **correct** answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (I), (B) - (III), (C) - (II), (D) - (IV)

(3) (A) - (II), (B) - (I), (C) - (IV), (D) - (III)

(4) (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution: The blood-gas partition coefficient determines the solubility of anesthetic agents in blood. A higher value indicates slower induction and recovery, while a lower value suggests faster onset and recovery. The correct match is as follows:

Nitrous Oxide (A) — Blood-Gas coefficient 2.30

Nitrous oxide has a relatively high coefficient, meaning slower induction and slower elimination. However, it is still commonly used due to its excellent analgesic properties.

Sevoflurane (B) — Blood-Gas coefficient 1.40

Sevoflurane is popular for pediatric anesthesia due to its fast induction and recovery times.

Isoflurane (C) — Blood-Gas coefficient 0.47

Isoflurane has a low coefficient, providing rapid onset and recovery, making it ideal for shorter procedures.

Halothane (D) — Blood-Gas coefficient 0.69

Halothane is no longer widely used due to its potential for hepatotoxicity, despite its moderately fast onset.

Quick Tip

A lower blood-gas partition coefficient indicates faster induction and recovery times for anesthetics.

---

63. Match List-I (Anti-cancer agents) with List-II (Cell cycle effects):

List-I	List-II
Anti-cancer agent	Cell cycle effects
(A). Gemcitabine	(I). G_2 - M Phase
(B). Etoposide	(II). S Phase
(C). Docetaxel	(III). G_1 - S Phase
(D). Bleomycin	(IV). M Phase

Choose the **correct** answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

(3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

(4) (A) - (II), (B) - (IV), (C) - (III), (D) - (I)

Correct Answer: (3) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

Solution: The correct matches between anti-cancer agents and their cell cycle effects are:

Gemcitabine (A) — S Phase

Gemcitabine is a pyrimidine analog that incorporates into DNA, inhibiting DNA synthesis during the S phase of the cell cycle. It is widely used in treating pancreatic, lung, and breast cancers.

Etoposide (B) — G1 - S Phase

Etoposide is a topoisomerase II inhibitor that induces DNA breaks during the G1 - S phase, preventing cell proliferation. It is commonly used for testicular and lung cancers.

Docetaxel (C) — M Phase

Docetaxel stabilizes microtubules, arresting cells in the M phase. It is a key drug in metastatic breast and prostate cancer treatments.

Bleomycin (D) — G2 - M Phase

Bleomycin causes DNA strand breaks, primarily affecting the G2 - M phase. It is frequently used in Hodgkin's lymphoma, testicular cancer, and squamous cell carcinoma.

Quick Tip

Most chemotherapeutic agents are phase-specific. Drugs like Gemcitabine (S phase) and Docetaxel (M phase) target rapidly dividing cells for maximum efficacy.

---

64. Match List-I with List-II of Hormones and Disorders

List-I	List-II
Hormone	Disorder
(A). Growth Hormone	(I). Pheochromocytoma
(B). Antidiuretic Hormone	(II). Grave's Disease
(C). T_3 and T_4	(III). Acromegaly
(D). Adrenaline	(IV). Diabetes Insipidus

Choose the correct answer from the options given below:

(1) (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

(2) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)

(3) (A) - (I), (B) - (IV), (C) - (II), (D) - (III)

(4) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

Correct Answer: (3) (A) - (I), (B) - (IV), (C) - (II), (D) - (III)

Solution: Growth hormone (A): Excess growth hormone leads to acromegaly (III), a condition characterized by abnormal growth of bones and tissues, particularly in the hands and face.

Antidiuretic hormone (B): A deficiency in this hormone leads to diabetes insipidus (IV), where the kidneys are unable to conserve water, leading to frequent urination and excessive thirst.

T3 and T4 (C): These thyroid hormones are involved in regulating metabolism, and their excess can lead to Grave's disease (II), an autoimmune disorder that causes hyperthyroidism.

Adrenaline (D): Excess adrenaline is associated with pheochromocytoma (I), a rare tumor of the adrenal gland that causes high blood pressure, sweating, and palpitations.

Thus, the correct matching is (A) - (I), (B) - (IV), (C) - (II), (D) - (III).

Quick Tip

Hormonal imbalances can lead to a wide variety of disorders, each with its own set of symptoms and treatments. Understanding the hormones involved is key to diagnosing and managing these conditions.

---

65. Sandarac is a resin obtained from the stem of

(1) Grindelia camporum

(2) Pistacia lentiscus

(3) Tetraclinis articulata

(4) Guaiacum officinale

Correct Answer: (3) Tetraclinis articulata

Solution: Sandarac resin is obtained from the stem of Tetraclinis articulata, a species of cypress-like trees found in Mediterranean regions.

Sandarac is used in varnishes, lacquers, and as a glazing agent due to its hard, glossy finish when dried.

The other plants listed are not known for producing Sandarac resin.

Thus, the correct answer is Tetraclinis articulata.

Quick Tip

Sandarac resin is valued in the art and craft industries due to its ability to form a durable, glossy finish when used in varnishes and lacquers.

---

66. Nominated members of the Drugs Technical Advisory Board are

(1) 8

(2) 7

(3) 6

(4) 5

Correct Answer: (3) 6

Solution: The Drugs Technical Advisory Board (DTAB) is an advisory body under the Drugs and Cosmetics Act of India, which helps in advising the central government on matters related to the approval of drugs and ensuring drug quality and safety.

The DTAB consists of 6 nominated members. These members include experts from various fields such as pharmaceuticals, medical sciences, and law.

The other options are incorrect, as the number of nominated members is specifically 6.

Thus, the correct answer is 6.

Quick Tip

The Drugs Technical Advisory Board (DTAB) plays a vital role in drug regulation, ensuring that medicines are safe, effective, and of high quality.

---

67. Following are the characteristics of tannins except:

(1) Tannins are colloidal solutions with water

(2) Small molecular weight are soluble in water

(3) Molecular weight ranges from 250-400

(4) Can bind with proteins and form insoluble or soluble tannin-protein complexes

Correct Answer: (2) Small molecular weight are soluble in water

Solution: Tannins are a group of polyphenolic compounds found in plants, and they have several important characteristics:

Tannins are colloidal solutions in water and exhibit strong astringency.

They typically have a molecular weight in the range of 500-3000, though some smaller tannins exist.

Tannins can bind to proteins, forming both soluble and insoluble complexes, which is why they are often used in the tanning of leather.

Tannins with small molecular weight are typically less soluble in water, as they tend to aggregate and form insoluble complexes.

Thus, the correct answer is Small molecular weight are soluble in water.

Quick Tip

Tannins are often used in the food and beverage industry for their astringency and ability to bind proteins, and they are also important in traditional medicine.

---

68. Identify the chemical constituent of Nutmeg

(1) Ellimicin

(2) Citral

(3) Piperine

(4) Curcumin

Correct Answer: (3) Piperine

Solution: Nutmeg is a spice derived from the seed of the tree Myristica fragrans. The primary active chemical constituent in nutmeg is piperine, which gives the spice its pungent flavor.

Ellimicin is found in cardamom, not nutmeg.

Citral is found in lemon grass and lemon peel, not nutmeg.

Curcumin is the active compound in turmeric, not nutmeg.

Thus, the correct answer is Piperine.

Quick Tip

Piperine, found in black pepper and nutmeg, is known for its bioavailability-enhancing effects and can increase the absorption of other compounds in the body.

---

69. Straw foxglove is also known as:

(1) Digitalis lanata

(2) Digitalis lutea

(3) Digitalis thapsi

(4) Digitalis dubia

Correct Answer: (1) Digitalis lanata

Solution: Straw foxglove is scientifically known as Digitalis lanata.

It is a biennial plant belonging to the Scrophulariaceae family and is a significant source of digoxin and digitoxin, which are potent cardiac glycosides used in heart failure and atrial fibrillation.

Digitalis lanata is preferred over Digitalis purpurea because it has a higher yield of digoxin, a safer and more effective cardiac glycoside.

In contrast:

Digitalis lutea and Digitalis thapsi are lesser-known Digitalis species with low cardiac glycoside content.

Digitalis dubia is not commonly utilized in medicine.

Quick Tip

Digoxin extracted from Digitalis lanata is widely used for heart conditions. Proper dosage management is essential to avoid toxicity.

---

69. Straw foxglove is also known as:

(1) Digitalis lanata

(2) Digitalis lutea

(3) Digitalis thapsi

(4) Digitalis dubia

Correct Answer: (1) Digitalis lanata

Solution: Straw foxglove is scientifically known as Digitalis lanata.

It is a biennial plant belonging to the Scrophulariaceae family and is a significant source of digoxin and digitoxin, which are potent cardiac glycosides used in heart failure and atrial fibrillation.

Digitalis lanata is preferred over Digitalis purpurea because it has a higher yield of digoxin, a safer and more effective cardiac glycoside.

In contrast:

Digitalis lutea and Digitalis thapsi are lesser-known Digitalis species with low cardiac glycoside content.

Digitalis dubia is not commonly utilized in medicine.

Quick Tip

Digoxin extracted from Digitalis lanata is widely used for heart conditions. Proper dosage management is essential to avoid toxicity.

---

71. Select the right plant growth regulator used for cell elongation and is agronomically important in determining plant height and fruit set:

(1) Auxins

(2) Gibberellins

(3) Abscisic acid

(4) Ethylene

Correct Answer: (2) Gibberellins

Solution: Gibberellins (GA) are plant growth regulators that play a crucial role in promoting cell elongation, stem elongation, flowering, and fruit development.

Gibberellins are particularly important in determining plant height and improving fruit set in agricultural crops.

Key roles of gibberellins include:

Stimulating cell division and elongation in stems.

Breaking seed dormancy and enhancing germination.

Improving fruit size and quality, especially in grapes and apples.

In contrast:

Auxins primarily promote root growth, apical dominance, and tropic movements.

Abscisic acid (ABA) inhibits plant growth and induces dormancy.

Ethylene is a gaseous hormone that regulates fruit ripening and leaf abscission.

Quick Tip

Gibberellins are widely used in horticulture to promote seed germination, increase fruit size, and improve crop yield.

---

72. Process of Shodhana can be performed using fluids

(A). Triphalakasaya

(B).Vasapatra svarasa

(C). Nirgundi patra svarasa with haridra churna

(D).Gomutra

(1) (A), (B) and (D) only

(2) (A), (B) and (C) only

(3) (A), (B), (C) and (D)

(4) (B), (C) and (D) only

Correct Answer: (3) (A), (B), (C) and (D)

Solution: In Ayurveda, the process of Shodhana is a detoxification procedure that is commonly performed using various fluids. These fluids help in purging toxins from the body and restoring balance. The following fluids are used for Shodhana:

(A) Triphalakasaya: A herbal preparation made from Triphala, often used in detoxification.

(B) Vasapatra Svarasa: A fluid prepared from the leaves of specific plants used for therapeutic cleansing.

(C) Nirgundi Patra Svarasa with Haridra Churna: A combination of Nirgundi leaf juice and

turmeric powder, used for its purifying properties.

(D) Gomutra: Cow urine, which is considered sacred and has medicinal properties used in detoxification.

Thus, all the given options are used in the Shodhana process.

Quick Tip

Shodhana is an important concept in Ayurvedic medicine, and these fluids help remove impurities from the body, promoting overall health.

---

73. Biosynthesis of atropine takes place in the following sequence

(A).Tropine+Tropic acid

(B).Tropic acid

(C).Phenyl pyruvic acid

(D).Phenylalanine

(1) (A), (B), (C), (D)

(2) (D), (B), (C), (A)

(3) (D), (C), (B), (A)

(4) (C), (B), (D), (A)

Correct Answer: (1) (A), (B), (C), (D)

Solution: The biosynthesis of atropine, a tropane alkaloid, involves a series of steps that occur in the plant's biochemical pathway:

(A) Tropine + Tropic acid: This is the first step, where tropine combines with tropic acid to form atropine.

(B) Tropic acid: Derived from phenylalanine and involved in the biosynthesis of tropane alkaloids.

(C) Phenyl pyruvic acid: It is converted into tropic acid, a precursor in the biosynthesis of atropine.

(D) Phenylalanine: This is the precursor amino acid from which phenyl pyruvic acid is derived.

Thus, the correct sequence is (A), (B), (C), (D).

Quick Tip

Atropine is synthesized in plants through a series of steps starting from phenylalanine, which is converted into various intermediates before the final atropine molecule is formed.

---

74. Match List-I with List-II of Schedule and Provisions

List-I	List-II
Schedule	Provisions
(A). F1- Part IA	(I). Provisions applicable to the manufacture and standardisation of diagnostic agents
(B).F1- Part IB	(II). Provisions applicable to the production of sera from living animals
(C). F1- Part II	(III). Provisions applicable to the production of bacterial vaccines
(D). F1- Part III	(IV).Provisions applicable to the production of viral vaccines

Choose the correct answer from the options given below:

(1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

(2) (A) - (II), (B) - (III), (C) - (I), (D) - (IV)

(3) (A) - (III), (B) - (IV), (C) - (II), (D) - (I)

(4) (A) - (III), (B) - (II), (C) - (IV), (D) - (I)

Correct Answer: (1) (A) - (I), (B) - (II), (C) - (III), (D) - (IV)

Solution: The F1 Schedule provides provisions for the manufacture and regulation of various pharmaceutical products. Each part addresses different types of products:

(A) F1 - Part IA: Relates to the manufacture and standardization of diagnostic agents (I).

(B) F1 - Part IB: Covers the production of sera from living animals (II).

(C) F1 - Part II: Deals with the production of bacterial vaccines (III).

(D) F1 - Part III: Pertains to the production of viral vaccines (IV).

Thus, the correct matching is (A) - (I), (B) - (II), (C) - (III), (D) - (IV).

Quick Tip

Understanding the F1 Schedule helps in ensuring compliance with regulatory standards for pharmaceutical manufacturing, including vaccines and diagnostic agents.

75. Match List-I with List-II of Chemical Test and End Point

List-I	List-II
Chemical Test	End point
(A).Liebermann -Burchard test	(I). Pink colour
(B).Salkowski test	(II). Violet colour
(C). Zimmermann test	(III). Yellow coloured ring
(D). Antimony trichloride test	(IV).Violet to blue coloured ring

Choose the correct answer from the options given below:

(1) (A) - (IV), (B) - (II), (C) - (III), (D) - (I)

(2) (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

(3) (A) - (I), (B) - (II), (C) - (IV), (D) - (III)

(4) (A) - (IV), (B) - (III), (C) - (II), (D) - (I)

Correct Answer: (1) (A) - (IV), (B) - (II), (C) - (III), (D) - (I)

Solution: The following chemical tests are used to detect various compounds and their reactions produce specific end points:

(A) Liebermann-Burchard test: Used for detecting sterols and bile acids, with the end point being violet to blue coloured ring (IV).

(B) Salkowski test: Used for detecting steroids with the end point being violet colour (II).

(C) Zimmermann test: Used for detecting phenolic compounds with the end point being yellow coloured ring (III).

(D) Antimony trichloride test: Used for detecting phenols with the end point being pink colour (I).

Thus, the correct matching is (A) - (IV), (B) - (II), (C) - (III), (D) - (I).

Quick Tip

These chemical tests are useful in the identification and analysis of various organic compounds in laboratory settings, especially in quality control and research.