AIIMS BSC Nursing 2024 Question Paper with Solutions

Time Allowed :2 Hours	**Maximum Marks :**480	**Total questions :**120

1. Inner wall of microsporangia is:

(A) Tepitame

(B) Epidermis

(C) Endothecium

(D) Middle layer

Correct Answer: (A) Tepitame

Solution:

The microsporangium is a structure in seed plants where microspores develop into pollen grains. It typically has four distinct layers:

- **Epidermis:** The outermost protective layer.
- **Tepitame:** The inner wall of the microsporangium, which provides mechanical support and helps in the dehiscence process.
- **Endothecium:** A layer that aids in the opening of the microsporangium to release pollen.
- **Middle layer:** A thin layer that usually degenerates early.

Among these, the **tepitame** specifically forms the inner wall of the microsporangium. It plays a crucial role in protecting the developing microspores and assists in the structural integrity of the sporangium.

Quick Tip

To remember microsporangium layers easily, note that the epidermis is outermost, the tepitame forms the inner wall, and the endothecium helps in spore release.

2. Which of the following hormones is not synthesized by anterior pituitary gland?

(A) Prolactin

(B) Vasopresin

(C) LH

(D) FSH

Correct Answer: (B) Vasopresin

Solution:

The anterior pituitary gland synthesizes several key hormones, including:

- **Prolactin:** Stimulates milk production.
- **LH (Luteinizing Hormone):** Involved in reproductive processes.
- **FSH (Follicle-Stimulating Hormone):** Stimulates the growth of ovarian follicles in females and spermatogenesis in males.

Vasopresin, also known as **ADH (Antidiuretic Hormone)**, is not synthesized by the anterior pituitary. It is produced by the hypothalamus and released from the posterior pituitary.

Quick Tip

Remember: ADH (Vasopresin) and Oxytocin are secreted by the posterior pituitary, not the anterior part.

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3. Pneumotaxic center is present in:

(A) Cerebellum

(B) Cerebrum

(C) Pons

(D) Medulla

Correct Answer: (C) Pons

Solution:

The pneumotaxic center, also known as the pontine respiratory group, is a critical component of the brain's respiratory control mechanism. It is located in the upper part of the brainstem known as the **pons**. This center primarily functions to regulate the duration of inspiration by sending inhibitory impulses to the medullary inspiratory center. By doing so, it helps in fine-tuning the breathing pattern, ensuring that each breath is smooth and appropriately timed. This regulation is essential to maintain the rhythm of breathing and to prevent over-inflation of the lungs. In contrast, the cerebellum and cerebrum are primarily involved in coordination and higher-order brain functions respectively, while the medulla also plays a role in respiration but houses the inspiratory and expiratory centers, not the pneumotaxic center.

Quick Tip

To remember easily: Think of "Pons" as the "Pause" regulator — it pauses inspiration to maintain smooth breathing by hosting the pneumotaxic center.

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4. PS I first wavelength / reaction center is:

(A) Chl–680

(B) Chl–700

(C) Chl–660

(D) Chl–760

Correct Answer: (B) Chl–700

Solution:

Photosystem I (PS I) is one of the two major protein-pigment complexes involved in the light reactions of photosynthesis. It plays a crucial role in converting light energy into chemical energy. The **reaction center** of PS I is specifically associated with a special form of chlorophyll a that absorbs light most efficiently at a wavelength of **700 nm**, hence it is called **P700** (where "P" stands for pigment and "700" indicates the peak absorption in nanometers). This reaction center is responsible for transferring high-energy electrons to the electron transport chain, which ultimately contributes to the synthesis of NADPH. This distinguishes

it from Photosystem II (PS II), which has a reaction center at 680 nm (P680). Options like Chl–660 and Chl–760 are incorrect as these wavelengths do not correspond to the peak absorption of any major photosystem's reaction center.

Quick Tip

Remember: PS I = P700, PS II = P680. The number corresponds to the wavelength (in nm) of light best absorbed by their reaction centers.

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5. Which fruit has fibrous mesocarp?

(A) Apple

(B) Coconut

(C) Strawberry

(D) Mango

Correct Answer: (B) Coconut

Solution:

In botanical terms, the structure of a fruit can be divided into three layers derived from the ovary wall: the epicarp (outer layer), mesocarp (middle layer), and endocarp (inner layer). In the case of the **coconut**, it is classified as a drupe—a fruit in which the mesocarp is distinctly fibrous.

The **mesocarp of coconut** forms the thick, fibrous husk that surrounds the hard inner shell. This fibrous layer aids in buoyancy, allowing coconuts to disperse by water, and also provides protective cushioning. On the other hand:

- **Apple** has a fleshy mesocarp and is a pome.
- **Strawberry** is an aggregate fruit with fleshy receptacle rather than typical mesocarp layers.
- **Mango** is a drupe too, but its mesocarp is fleshy rather than fibrous.

Therefore, among the given options, only the coconut has a truly fibrous mesocarp.

Quick Tip

Think of the fibrous husk you peel off a coconut—that's the mesocarp! This feature makes coconut unique among commonly known fruits.

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6. Which kingdom is included in all kingdom system classifications?

(A) Monera

(B) Protista

(C) Fungi

(D) Plantae and Animalia

Correct Answer: (D) Plantae and Animalia

Solution:

Throughout the history of biological classification, the categorization of organisms into kingdoms has evolved. Early systems began with just two kingdoms: **Plantae and Animalia**. Even as newer systems were proposed—such as the three-kingdom (including Protista), four-kingdom (adding Monera), five-kingdom (adding Fungi), and six-kingdom systems—**Plantae and Animalia** have always remained a constant part of every classification.

This is because plants and animals are the most distinct and universally recognized groups of multicellular organisms. Their inclusion dates back to Aristotle and Linnaeus and has persisted through all modern biological classification systems due to their fundamental biological differences in nutrition, mobility, and structure.

In contrast:

- **Monera** was not present in early two-kingdom systems.
- **Protista** emerged later as a catch-all for unicellular organisms.
- **Fungi** were initially grouped with plants and only later given a separate kingdom.

Therefore, only **Plantae and Animalia** have been included consistently in all kingdom classification systems.

Quick Tip

Always included: Plantae and Animalia — the foundation of every classification system, from two-kingdom to six-kingdom models.

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7. In commensalism, two organisms have:

(A) Benefit to both

(B) Harm to both

(C) Benefit to one and harm to the other

(D) Benefit to one and neither harm nor benefit to the other

Correct Answer: (D) Benefit to one and neither harm nor benefit to the other

Solution:

Commensalism is a type of symbiotic relationship between two organisms in which one organism benefits while the other is neither helped nor harmed. It differs from mutualism, where both organisms benefit, and parasitism, where one benefits at the expense of the other. A classic example of commensalism is barnacles growing on whales. The barnacles benefit by gaining mobility and access to nutrient-rich waters as the whale swims, while the whale remains unaffected.

In summary:

- (A) Describes mutualism — incorrect.
- (B) Describes competition — incorrect.
- (C) Describes parasitism — incorrect.
- (D) Describes commensalism — **correct**.

Quick Tip

Remember: In commensalism, one wins, the other doesn't lose — it's a neutral relationship for one and beneficial for the other.

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8. Which of the following statements is not true?

(A) Wing of bird and butterfly are analougous organ.

(B) Thorn of bouganvillia and tendril of cucurbita are homologous organ.

(C) Sweet potato and potato is an example of homologous organ.

(D) Eyes of octopus and human have similar functions but evolved independently.

Correct Answer: (C) Sweet potato and potato is an example of homologous organ.

Solution:

Sweet potato and potato are not homologous organs; they are **analogous** structures.

Although both are underground storage organs, they differ in origin:

- Sweet potato is a modified root.
- Potato is a modified stem (tuber).

Thus, they perform a similar function (storage) but have different anatomical origins, making them analogous.

In contrast:

- (A) Wing of bird and butterfly — both used for flying but structurally different — **analogous**.
- (B) Thorn of bougainvillea and tendril of cucurbita — structurally similar, both derived from stem — **homologous**.

Quick Tip

Analogous organs perform similar functions but differ in structure and origin; homologous organs share a common structure but may serve different functions.

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9. What are the organisms that eat dead and decaying matter?

(A) Autotrophs

(B) Heterotrophs

(C) Saprotrophs

(D) Symbiotic

Correct Answer: (C) Saprotrophs

Solution:

Saprotrophs are organisms that obtain their nutrition from dead and decaying organic matter. They secrete digestive enzymes onto the matter and absorb the simpler nutrients that result from the breakdown. Fungi and some bacteria are prime examples of saprotrophic organisms.

Explanation of other options:

- (A) Autotrophs produce their own food via photosynthesis — incorrect.
- (B) Heterotrophs consume living organisms for energy — incorrect in this context.
- (D) Symbiotic organisms live in association with another species, often with mutual benefit — not the correct term for decomposers.

Quick Tip

Saprotrophs = Decomposers. Think fungi and bacteria that ”clean up” the ecosystem by feeding on waste and dead matter.

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10. Which protein is present in muscle?

(A) Myosin

(B) Keratin

(C) Serin

(D) Cellulose

Correct Answer: (A) Myosin

Solution:

Myosin is a motor protein that plays a key role in muscle contraction. It interacts with another protein called actin to enable the sliding filament mechanism that drives muscle movement.

Explanation of other options:

- (B) Keratin is found in hair, nails, and skin — not involved in muscle movement.
- (C) Serin (Serine) is an amino acid, not a structural protein in muscles.
- (D) Cellulose is a carbohydrate found in plant cell walls — not a protein.

Quick Tip

Muscle movement = Actin + Myosin. Always remember, myosin is the muscle protein responsible for contraction.

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11. Chiasmata formation occurs during which sub-stage of meiosis?

(A) Pachytene

(B) Diplotene

(C) Leptotene

(D) Zygotene

Correct Answer: (B) Diplotene

Solution:

Chiasmata are the visible manifestations of crossing over between homologous chromosomes, and they become apparent during the **diplotene** stage of prophase I of meiosis.

- During **leptotene**, chromosomes begin to condense.
- In **zygotene**, homologous chromosomes begin pairing (synapsis).
- **Pachytene** is when crossing over occurs.
- **Diplotene** is when the synaptonemal complex dissolves and chiasmata become visible — **correct stage**.

Quick Tip

Remember: Crossing over happens in pachytene, but **chiasmata become visible** in diplotene — think ”D” for Diplotene and Display.

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12. Androgen is secreted by which of the following cells?

(A) Sertoli Cell

(B) Leydig Cell

(C) Follicle Cell

(D) Nurse Cell

Correct Answer: (B) Leydig Cell

Solution:

Leydig cells are found in the interstitial tissue of the testes and are responsible for the production and secretion of androgens, primarily testosterone. These hormones regulate the development of male reproductive tissues and secondary sexual characteristics.

Clarification on other options:

- (A) Sertoli cells help in the nourishment and development of sperm, but do not secrete androgens.
- (C) Follicle cells are associated with the female reproductive system and secrete estrogen, not androgens.
- (D) Nurse cell typically refers to Sertoli cells in this context — still incorrect.

Quick Tip

Leydig cells = Testosterone producers. Think ”L” for Leydig and ”L” for Libido.

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13. How is the male frog different from the female frog?

(A) Copulatory Pad

(B) Vocal Sac

(C) Cloaca

(D) Abdominal Region

Correct Answer: (A) Copulatory Pad

Solution:

The male frog possesses a specialized structure known as the **copulatory pad**, found on the first digit of the forelimbs. This pad helps the male grasp the female during amplexus (mating).

Explanation of other options:

- (B) Vocal sac is present in males but not the primary differentiator in this context.
- (C) Cloaca is present in both sexes for excretion and reproduction — not a difference.
- (D) Abdominal region is not structurally distinct between sexes in frogs — incorrect.

Quick Tip

Male frogs have **copulatory pads** to hold onto the female during mating. Think of it as their "mating grip."

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14. Which of the following is *not* a sexually transmitted disease (STD)?

(a) Hepatitis B

(b) Syphilis

(c) Gonorrhea

(d) Ascariasis

Correct Answer: (d) Ascariasis

Solution:

Ascariasis is a parasitic infection caused by the roundworm *Ascaris lumbricoides*. It is transmitted via contaminated food or water (fecal-oral route), not through sexual contact.

Explanation of other options:

- (a) Hepatitis B is a viral infection that can be transmitted sexually — it is considered an STD.
- (b) Syphilis is a bacterial STD caused by *Treponema pallidum*.
- (c) Gonorrhea is a common STD caused by the bacterium *Neisseria gonorrhoeae*.

Quick Tip

If a disease is caused by a parasite like a roundworm (e.g., Ascariasis), it's likely transmitted via poor hygiene, not sexual activity.

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15. Correct Match:

Match the following compounds with their correct categories:

(A) Carotenoid	Polymer
(B) Abrin	Pigment
(C) Cellulose	Toxin
(D) Morphine	Alkaloid

Correct Answer:

(A) – Pigment, (B) – Toxin, (C) – Polymer, (D) – Alkaloid

Solution:

- **Carotenoid** – Pigments found in plants, not polymers. Hence, incorrect match.
- **Abrin** – A toxic protein, not a pigment. Hence, incorrect match.
- **Cellulose** – A polysaccharide (polymer), not a toxin. Hence, incorrect match.
- **Morphine** – Correctly matched as an alkaloid.

Quick Tip

Only Morphine $\rightarrow$ Alkaloid is correctly matched. All other pairs are mismatched.

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16. Correct Statement:

Identify the correct scientific statement from the options below:

(A) Chargaff's rule: $A + T = G + C$

(B) DNA is a polymer of nucleotides

(C) Euchromatin is loosely connected

(D) DNA backbone is composed of nitrogenous bases

Correct Answer: (B)

Solution:

- **Option A:** Incorrect. Chargaff's rule correctly states $A = T$ and $G = C$, but not that $A + T = G + C$.
- **Option B:** Correct. DNA is indeed made of repeating nucleotide units, forming a polymer.
- **Option C:** Incorrect. While euchromatin is loosely packed, this statement lacks completeness and clarity.
- **Option D:** Incorrect. The DNA backbone is actually composed of sugar-phosphate units, not nitrogenous bases.

Quick Tip

Tip: DNA = Deoxyribonucleic Acid. It is a polymer made up of nucleotides, each containing a sugar, a phosphate, and a nitrogenous base.

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17. Which statement about ammonia is *false*?

(A) Kidney does not excrete ammonia

(B) More water is required for ammonia excretion

(C) Ammonia is a more toxic substance

(D) Ammonia is converted into urea

Correct Answer: (A) Kidney does not excrete ammonia

Solution:

The kidneys do excrete ammonia, although in small amounts. Ammonia plays a role in maintaining acid-base balance in the body, and it is excreted in the urine in the form of ammonium ions.

- (A) This statement is false — kidneys do excrete ammonia. — **Correct answer**
- (B) This is true — ammonia requires a large volume of water for safe excretion because of its high toxicity.
- (C) This is true — ammonia is highly toxic and needs to be removed quickly.
- (D) This is true — in many organisms, ammonia is converted into urea (ureotelic organisms) to reduce toxicity.

Quick Tip

Ammonia is highly toxic and water-soluble — it must be excreted quickly or converted into less toxic forms like urea or uric acid.

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18. Which is the *incorrect* statement about Mycoplasma?

(A) Cell wall present in Mycoplasma

(B) Pathogen for plant and animal

(C) Included in Monera

(D) Prokaryotic organism

Correct Answer: (A) Cell wall present in Mycoplasma

Solution:

Mycoplasma is a unique genus of bacteria known for lacking a cell wall, which makes them resistant to antibiotics that target cell wall synthesis, such as penicillin.

- (A) This is incorrect — Mycoplasma lacks a cell wall. — **Correct answer**
- (B) This is correct — Mycoplasma can infect both plants and animals.

- (C) This is correct — Mycoplasma is classified under the kingdom Monera.
- (D) This is correct — Mycoplasma is a prokaryotic organism.

Quick Tip

Remember: Mycoplasma is the smallest living cell and **lacks a cell wall**, making it naturally resistant to many antibiotics.

Chemistry

19. Which of the following is the correct melting point order of dichlorobenzene isomers?

(A) 1,2-Dichlorobenzene ¡ 1,3-Dichlorobenzene ¡ 1,4-Dichlorobenzene

(B) 1,4-Dichlorobenzene ¡ 1,2-Dichlorobenzene ¡ 1,3-Dichlorobenzene

(C) 1,2-Dichlorobenzene ¡ 1,4-Dichlorobenzene ¡ 1,3-Dichlorobenzene

(D) 1,3-Dichlorobenzene ¡ 1,2-Dichlorobenzene ¡ 1,4-Dichlorobenzene

Correct Answer: (A) 1,2-Dichlorobenzene ¡ 1,3-Dichlorobenzene ¡ 1,4-Dichlorobenzene

Solution:

The melting point of dichlorobenzene isomers depends on the symmetry of the molecules:

- **1,4-Dichlorobenzene** is the most symmetrical, leading to better packing in the solid state and hence the highest melting point.
- **1,3-Dichlorobenzene** has intermediate symmetry.
- **1,2-Dichlorobenzene** has the least symmetry, resulting in poor packing and the lowest melting point.

Quick Tip

More symmetrical molecules pack better in the solid phase and generally have higher melting points.

20. Benzaldehyde reacts with *conc. NaOH* to give:

(A) Benzyl alcohol

(B) Sodium benzoate

(C) Phenol

(D) Benzyl alcohol and sodium benzoate

Correct Answer: (D) Benzyl alcohol and sodium benzoate

Solution:

This is a classic example of the **Cannizzaro reaction**, which occurs when aldehydes without an alpha-hydrogen are treated with concentrated alkali (like NaOH). In this reaction:

- One molecule of benzaldehyde is reduced to **benzyl alcohol**.
- Another molecule is oxidized to **sodium benzoate**.

Hence, the products are both benzyl alcohol and sodium benzoate.

Quick Tip

In a Cannizzaro reaction, aldehydes with no α-hydrogen undergo disproportionation: one part is reduced, the other is oxidized.

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21. Which enzyme converts glucose and fructose both into ethanol?

(A) Invertase

(B) Zymase

(C) Maltase

(D) Diastase

Correct Answer: (B) Zymase

Solution:

Zymase is a complex of enzymes found in yeast. It catalyzes the fermentation of glucose and fructose to ethanol and carbon dioxide. The overall reaction is:

$$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$$

- (A) Invertase breaks sucrose into glucose and fructose — incorrect.
- (B) Zymase ferments glucose and fructose into ethanol — **correct**.
- (C) Maltase breaks down maltose into glucose — incorrect.
- (D) Diastase breaks starch into maltose — incorrect.

Quick Tip

Remember: **Zymase = Fermentation**. It converts simple sugars like glucose and fructose into ethanol in anaerobic conditions.

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22. What is the chemical name of Vitamin B6?

(A) Biotin

(B) Thiamine

(C) Riboflavin

(D) Pyridoxine

Correct Answer: (D) Pyridoxine

Solution:

Vitamin B6 is a water-soluble vitamin that exists in several forms, the most common being **pyridoxine**. It plays a key role in protein metabolism, cognitive development, and the production of neurotransmitters.

- (A) Biotin is Vitamin B7 — incorrect.
- (B) Thiamine is Vitamin B1 — incorrect.
- (C) Riboflavin is Vitamin B2 — incorrect.
- (D) Pyridoxine is Vitamin B6 — **correct**.

Quick Tip

Remember: **Pyridoxine = Vitamin B6**. It supports brain health and helps convert food into energy.

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23. Chemical formula of Water-gas is:

(A) $CO_2 + H_2O$

(B) $CO + H_2$

(C) $SO_2 + CO_2 + Heat$

(D) $CO + H_2O_2$

Correct Answer: (B) $CO + H_2$

Solution:

Water-gas is a synthesis gas composed mainly of carbon monoxide (CO) and hydrogen (H_2). It is produced by passing steam over red-hot coke (carbon), following the reaction:

$$C + H_2O \rightarrow CO + H_2$$

This gas mixture is used as a fuel and as a reducing agent in industrial processes.

- (A) $CO_2 + H_2O$ is not water-gas — incorrect.
- (B) $CO + H_2$ is the correct composition of water-gas — **correct**.
- (C) $SO_2 + CO_2 + Heat$ is not related — incorrect.
- (D) $CO + H_2O_2$ is not a known industrial gas — incorrect.

Quick Tip

Water-gas = CO + H_2. It's a product of coke and steam reaction, often used in synthesis and metallurgy.

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24. Which of the following correctly represents the order of basic strength among Group 15 hydrides?

(A) BiH_3 ¿ SbH_3 ¿ AsH_3 ¿ PH_3 ¿ NH_3

(B) NH_3 ¿ PH_3 ¿ AsH_3 ¿ SbH_3 ¿ BiH_3

(C) NH_3 ¡ PH_3 ¡ AsH_3 ¡ SbH_3 ¡ BiH_3

(D) PH_3 ¿ NH_3 ¿ AsH_3 ¿ SbH_3 ¿ BiH_3

Correct Answer: (B) NH_3 ¿ PH_3 ¿ AsH_3 ¿ SbH_3 ¿ BiH_3

Solution:

The basic strength of Group 15 hydrides decreases down the group. This is because the availability of the lone pair for donation (which determines basicity) decreases as the size of the central atom increases, leading to poorer overlap with the proton (H^+).

Thus, the correct order is:

$$NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$$

- (A) Reverse order — incorrect.
- (B) Correct trend — **correct**.
- (C) Incorrect as it suggests increasing basicity down the group.
- (D) NH_3 is more basic than PH_3, so this order is wrong.

Quick Tip

Basic strength of Group 15 hydrides decreases down the group due to decreasing availability of the lone pair on the central atom.

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25. Which of the following is Hinsberg reagent?

(A) $C_6H_5SO_2CH_3$

(B) $SnCl_2$

(C) $C_6H_5SO_2Cl$

(D) $CoCl_2$

Correct Answer: (C) $C_6H_5SO_2Cl$

Solution:

The **Hinsberg reagent** is benzene sulfonyl chloride, with the formula $C_6H_5SO_2Cl$. It is used in the Hinsberg test to distinguish between primary, secondary, and tertiary amines based on their reactivity.

- (A) $C_6H_5SO_2CH_3$ — methylated product, not the reagent — incorrect.
- (B) $SnCl_2$ — a reducing agent, not related to the Hinsberg test — incorrect.
- (C) $C_6H_5SO_2Cl$ — **correct**, the Hinsberg reagent.
- (D) $CoCl_2$ — cobalt chloride, unrelated — incorrect.

Quick Tip

Hinsberg reagent ($C_6H_5SO_2Cl$) is used to test amines — only primary and secondary amines react, forming sulfonamides.

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26. Standard electrode potentials of Na, Ni, and Cl are given. Which one has the highest reducing power?

$$\mathrm{Cl_2}(g) + 2e^- \rightarrow 2\mathrm{Cl}^-$$
$$\mathrm{Ni}^{2+} + 2e^- \rightarrow \mathrm{Ni}(s)$$
$$\mathrm{Na}^{+} + e^- \rightarrow \mathrm{Na}(s)$$

(A) Cl_2

(B) Ni^{2+}

(C) Na^+

(D) All have equal reducing power

Correct Answer: (C) Na^+

Solution:

Reducing power refers to the ability of a species to lose electrons and reduce another species. The lower the standard electrode potential (E°), the higher the reducing power. Na^+ has the lowest E° value among Na, Ni, and Cl, making Na the strongest reducing agent.

- Cl_2 has a high E°, so it acts as an oxidizing agent — incorrect.
- Ni^{2+} has a moderate E°, weaker reducing power — incorrect.
- Na^+ has the lowest E° and the **highest reducing power — correct**.

Quick Tip

Reducing power increases as the standard electrode potential becomes more negative. Among common elements, alkali metals like Na are strong reducing agents.

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27. A reaction with reaction quotient Q_C and equilibrium constant K_C will proceed in the direction of the products when:

(A) $Q_C = K_C$

(B) $Q_C > K_C$

(C) $Q_C < K_C$

(D) $Q_C = 0$

Correct Answer: (C) $Q_C < K_C$

Solution:

The reaction quotient Q_C compares the current ratio of product and reactant concentrations to the equilibrium constant K_C.

$$\begin{cases} Q_C < K_C & \text{means the reaction shifts toward products to reach equilibrium,} \\ Q_C = K_C & \text{means the system is at equilibrium,} \\ Q_C > K_C & \text{means the reaction shifts toward reactants.} \end{cases}$$

Since $Q_C < K_C$, more products will form until Q_C rises to equal K_C.

- (A) $Q_C = K_C$ — no net reaction (at equilibrium) — incorrect.

- (B) $Q_C > K_C$ — reaction shifts left (toward reactants) — incorrect.
- (C) $Q_C < K_C$ — reaction shifts right (toward products) — **correct**.
- (D) $Q_C = 0$ — an extreme case of (C), but general condition is $Q_C < K_C$ — incomplete.

Quick Tip

If $Q_C < K_C$, reactant concentrations are too high relative to products—so the reaction moves forward to make more products.

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28. Which of the following is not isoelectronic?

(A) CO

(B) CN^-

(C) NO^+

(D) O_2^{2-}

Correct Answer: (D) O_2^{2-}

Solution:

Isoelectronic species have the same number of electrons. Let's count the total electrons in each:

- CO: C (6) + O (8) = 14 electrons
- CN^-: C (6) + N (7) + 1 (from charge) = 14 electrons
- NO^+: N (7) + O (8) 1 (due to positive charge) = 14 electrons
- O_2^{2-}: O (8 × 2) + 2 (from charge) = 18 electrons

So, only O_2^{2-} is not isoelectronic with the others.

Quick Tip

To check for isoelectronic species, sum the atomic numbers and adjust for ionic charges to get the total number of electrons.

29. LiH, $HClO_4$, O_3, P_4 Oxidation states of the elements are respectively:

(A) $-1,\ +7,\ 0,\ 0$

(B) $+1,\ +7,\ -1,\ 0$

(C) $-1,\ +5,\ -1,\ +3$

(D) $+1,\ +5,\ 0,\ 0$

Correct Answer: (A) $-1,\ +7,\ 0,\ 0$

Solution:

- In LiH, H is less electronegative than Li, so H has an oxidation state of -1.
- In $HClO_4$, Cl is in the +7 oxidation state to balance four -2 from oxygen and $+1$ from hydrogen.
- O_3 is elemental oxygen, so the oxidation state is 0.
- P_4 is elemental phosphorus, so the oxidation state is 0.

Quick Tip

In compounds with metals like LiH, hydrogen can have an oxidation state of -1. Always check for elemental forms — their oxidation state is 0.

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30. Which of the following has a higher dipole moment?

(A) NH_3

(B) NF_3

(C) Both have equal dipole moments

(D) None of the above

Correct Answer: (A) NH_3

Solution:

- NH_3 has a trigonal pyramidal shape with a lone pair on nitrogen. The dipole moment of the three N–H bonds and the lone pair add constructively.

- NF_3 also has a trigonal pyramidal shape, but the highly electronegative F atoms pull electron density away from N, opposing the dipole due to the lone pair.
- As a result, NH_3 has a higher net dipole moment than NF_3.

Quick Tip

Even though fluorine is more electronegative than hydrogen, molecular geometry and vector cancellation determine the net dipole moment.

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31. Triclinic crystal system has the following unit cell dimensions:

(A) $a = b = c$ and $\alpha = \beta = \gamma = 90^\circ$

(B) $a = b \neq c$ and $\alpha = \beta = \gamma = 90^\circ$

(C) $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$

(D) $a = b \neq c$ and $\alpha = \beta = 90^\circ$, $\gamma = 120^\circ$

Correct Answer: (C) $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$

Solution:

- The triclinic crystal system is the most general and least symmetric system.
- It has all sides of different lengths ($a \neq b \neq c$) and none of the angles are 90° ($\alpha \neq \beta \neq \gamma \neq 90^\circ$).
- This makes it distinct from other systems like cubic or tetragonal which have more symmetry.

Quick Tip

Triclinic system = all lengths and all angles are unequal and not 90°.

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32. Point out the wrong statement: Physical adsorption is characterised by

(A) Attraction due to weak Vander Waal's forces

(B) Irreversible nature of adsorption

(C) Multimolecular adsorption layers

(D) Decrease in adsorption with increase in temperature

Correct Answer: (B) Irreversible nature of adsorption

Solution:

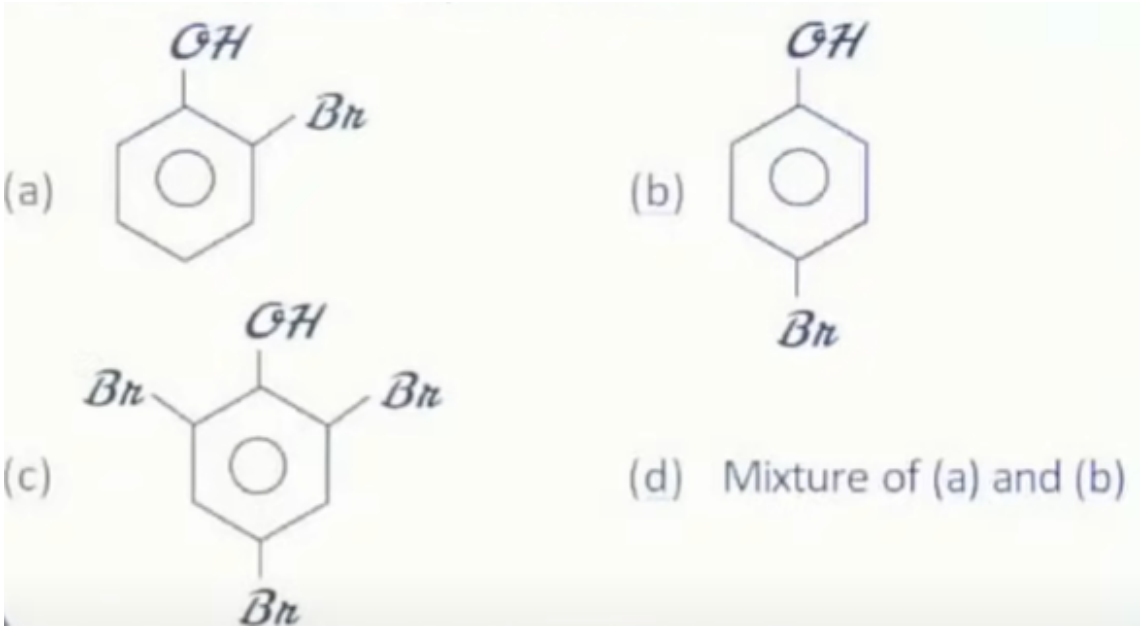
- Physical adsorption is due to weak Van der Waal's forces, making it a reversible process.
- It generally forms multilayer adsorption and decreases with an increase in temperature.
- Therefore, stating that it is "irreversible" is incorrect — that property is characteristic of chemical adsorption.

Quick Tip

Physical adsorption is usually reversible, weak, and forms multiple layers. Irreversibility indicates chemisorption.

---

33. With excess bromine, phenol reacts to form



Correct Answer: (C)

Solution:

- Phenol is highly reactive towards electrophilic aromatic substitution due to the activating effect of the -OH group.
- In the presence of excess bromine, it undergoes tribromination at the ortho and para positions relative to the hydroxyl group.
- Therefore, the major product is 2,4,6-tribromophenol.

Quick Tip

Phenol reacts rapidly with Br_2 even in water, forming white precipitate of 2,4,6-tribromophenol.

---

34. The IUPAC name of the complex compound $[CoCl_2(en)_2]Cl$ is:

(A) Dichloridobis(ethane-1,2-diamine)cobalt(III) chloride

(B) Dichloridobis(ethane-2,1-diamine)cobalt(III) chloride

(C) Dichloridobis(ethylenediamine)cobalt(III) chloride

(D) Bis(ethylenediamine)cobalt(III) chloride

Correct Answer: (A)

Solution:

- The complex contains 2 chloride ions and 2 ethylenediamine (en) ligands.
- Ethylenediamine is a bidentate ligand, also called ethane-1,2-diamine in IUPAC naming.
- The oxidation state of cobalt in the complex ion is +3, so it is cobalt(III).
- The anionic part outside the complex is chloride.
- Thus, the correct IUPAC name is Dichloridobis(ethane-1,2-diamine)cobalt(III) chloride.

Quick Tip

When naming coordination compounds, remember to use the IUPAC names of ligands, such as ”ethane-1,2-diamine” instead of common names like ”ethylenediamine.”

35. Muscle cells contain _____ protein.

(A) Casein

(B) Actin

(C) Myosin

(D) Lactose

Correct Answer: (C)

Solution:

- Muscle cells primarily contain two types of proteins involved in contraction: actin and myosin.
- Myosin is the thick filament and plays a major role in the contraction mechanism of muscles.
- Among the given options, myosin is the most appropriate answer for the blank.

Quick Tip

Myosin is a motor protein essential for muscle contraction and is found predominantly in muscle tissue.

---

36. Which of the following shows ferrimagnetism?

(A) TiO_2

(B) CrO_2

(C) MnO

(D) Fe_3O_4

Correct Answer: (D)

Solution:

- Ferrimagnetism is a type of magnetism observed in materials like Fe_3O_4 (magnetite), where the magnetic moments of the atoms on different sublattices are opposed, but unequal, resulting in a net magnetic moment.

- TiO_2, CrO_2, and MnO do not exhibit ferrimagnetism; CrO_2 is ferromagnetic, while MnO is antiferromagnetic.

Quick Tip

Ferrimagnetism is typical of ferrites such as Fe_3O_4, where magnetic ions occupy different lattice sites and align in opposite directions, but with unequal moments.

---

37. What is the conjugate base of HSO_4^-?

(A) SO_4^{2-}

(B) H_2SO_3

(C) OH^-

(D) H_2SO_4

Correct Answer: (A)

Solution:

- A conjugate base is formed when an acid donates a proton (H^+).
- HSO_4^- is the hydrogen sulfate ion. When it loses a proton, it forms SO_4^{2-} (sulfate ion), which is its conjugate base.

Quick Tip

To find the conjugate base of an acid, remove one H^+ from the acid and decrease the charge by 1.

---

38. Amorphous substances show

(A) isotropic

(B) Short range order

(C) Long range order

(D) Have no sharp M.P.

Correct Answer: (B), (D)

Solution:

- Amorphous substances do not have a long-range orderly structure like crystalline solids.
- They exhibit only short-range order due to irregular particle arrangement.
- Also, they do not possess a sharp melting point and soften over a range of temperatures.

Quick Tip

Crystalline solids have long-range order and sharp melting points; amorphous solids do not.

---

39. Which of the following series in the spectrum of hydrogen atom lies in the visible region of the electromagnetic spectrum?

(a) Paschen series

(b) Balmer series

(c) Lyman series

(d) Brackett series

Correct Answer: (b) Balmer series

Solution:

- The hydrogen spectrum consists of several series: Lyman, Balmer, Paschen, Brackett, and Pfund.
- Among these, only the Balmer series falls in the visible region of the electromagnetic spectrum (wavelengths approximately 400–700 nm).
- The Balmer series corresponds to electron transitions ending at the second energy level ($n = 2$).

Quick Tip

Remember: Lyman (UV), Balmer (Visible), Paschen/Brackett/Pfund (Infrared).

40. Calculate the angular velocity of an electron in a hydrogen atom in the second orbit ($n = 2$).

(A) 5.15×10^{15} rad/s

(B) 7.15×10^{15} rad/s

(C) 8.15×10^{15} rad/s

(D) 12.25×10^{15} rad/s

Correct Answer: (A) 5.15×10^{15} rad/s

Solution:

- The speed of an electron in the n^{th} orbit of hydrogen is given by:

$$v = 2.188 \times 10^6 \times \frac{Z}{n} \text{ m/s}$$

- Angular velocity is given by:

$$\omega = \frac{v_n}{r_n}$$

- Using the expression:

$$\omega = \frac{2.18}{5.29} \times \frac{Z^2}{n^3} \times 10^{17}$$

- For hydrogen, $Z = 1$, and $n = 2$, so:

$$\omega = \frac{2.18}{5.29} \times \frac{1^2}{2^3} \times 10^{17}$$

- Simplifying:

$$\omega = 5.15 \times 10^{15} \text{ rad/s}$$

Answer: 5.15×10^{15} rad/s

---

41. In which Indian state is the Flamingo Festival celebrated?

(A) Gujarat

(B) Rajasthan

(C) Andhra Pradesh

(D) Tamil Nadu

Correct Answer: (C) Andhra Pradesh

Solution:

The Flamingo Festival is celebrated annually in Andhra Pradesh, primarily at Pulicat Lake and the Nelapattu Bird Sanctuary, located in the Nellore district. This event occurs during the winter months when thousands of migratory birds, especially flamingos, arrive from various parts of the world.

The festival is not just a celebration of the arrival of these beautiful birds, but also serves to raise awareness about the conservation of wetland ecosystems. It attracts bird watchers, researchers, and tourists, promoting eco-tourism and local biodiversity education.

Pulicat Lake, the second-largest brackish water lake in India, provides an ideal habitat for these migratory species. The Flamingo Festival is organized by the Andhra Pradesh Tourism Department in collaboration with forest and environmental authorities.

Quick Tip

Remember, Pulicat Lake in Andhra Pradesh is a key wintering ground for flamingos and the highlight location of the Flamingo Festival.

---

42. Which planet is referred to as the ”Swift” planet?

(A) Venus

(B) Mars

(C) Mercury

(D) Jupiter

Correct Answer: (C) Mercury

Solution:

Mercury is called the ”Swift” planet because it has the shortest orbital period around the Sun of all the planets in the solar system. It takes only about 88 Earth days to complete one revolution. This fast movement across the sky, as observed from Earth, earned it the name ”Swift.”

Its close proximity to the Sun and its high orbital speed result in Mercury appearing to swiftly move across the sky. This is why ancient astronomers associated Mercury with speed and agility, often linking it to the Roman messenger god Mercury, who was known for his swiftness.

In comparison:

- Venus takes about 225 days — slower than Mercury.
- Mars takes about 687 days.
- Jupiter, being a gas giant farther from the Sun, takes nearly 12 Earth years.

Quick Tip

Mercury = Messenger + Speed $\rightarrow$ Think "Swift planet" for its quick orbit around the Sun.

---

43. Who was the first Indian woman to receive the Arjuna Award?

(A) P. T. Usha

(B) Karnam Malleswari

(C) Mary Kom

(D) N. Lumsden

Correct Answer: (D) N. Lumsden

Solution:

Nora Margaret Polley Lumsden, known as N. Lumsden, was the first Indian woman to receive the prestigious Arjuna Award in 1961. She was a talented badminton player who represented India at national and international levels.

The Arjuna Awards were instituted in 1961 by the Government of India to recognize outstanding achievement in sports. Being the first woman recipient marked a significant milestone in Indian sports history and women's representation in athletics.

Her achievement paved the way for future generations of Indian sportswomen, highlighting the growing role of women in the national sports arena.

Quick Tip

Remember: The Arjuna Awards started in 1961, and the first Indian woman awardee was N. Lumsden, a badminton player.

---

44. A book always has:

(A) Pages

(B) Chapter

(C) Diagram

(D) Cover

Correct Answer: (A) Pages

Solution:

A book, by definition, is a collection of written, printed, or illustrated pages bound together. The one essential component of any book is its pages — without them, it cannot be called a book. While chapters, diagrams, and covers are common features in many books, they are not essential or universally present.

- (A) Pages — **Correct**, every book must have pages.
- (B) Chapter — Not all books are divided into chapters.
- (C) Diagram — Not all books contain diagrams.
- (D) Cover — Useful, but even a draft book can exist without a formal cover.

Quick Tip

If you're unsure, think of the most fundamental element. A book without pages is not a book!

Physics

45. An object is placed 10 cm in front of a concave mirror with a focal length of 20 cm. What is the magnification produced?

(A) 1

(B) 2

(C) 0.5

(D) -2

Correct Answer: (B) 2

Solution:

Given:

$$f = -20\,\text{cm}, \quad u = -10\,\text{cm}$$

Using the mirror formula:

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u} \Rightarrow \frac{1}{-20} = \frac{1}{v} + \frac{1}{-10} \Rightarrow \frac{1}{v} = \frac{-1}{20} + \frac{1}{10} = \frac{1}{20} \Rightarrow v = 20\,\text{cm}$$

Now, magnification is:

$$m = -\frac{v}{u} = -\frac{+20}{-10} = +2$$

This means the image is virtual, upright, and magnified by a factor of 2.

Quick Tip

Use the mirror formula $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ and the magnification formula $m = -\frac{v}{u}$ carefully. Pay attention to sign conventions!

---

46. What is the angular momentum of an electron in an atom if the principal quantum number $n = 2$?

(A) $\frac{h}{2\pi}$

(B) $\frac{2h}{\pi}$

(C) $\frac{2h}{2\pi}$

(D) $\frac{nh}{2\pi}$

Correct Answer: (D) $\frac{nh}{2\pi}$

Solution:

According to the Bohr model of the atom, the angular momentum L of an electron in a quantized orbit is given by:

$$L = \frac{nh}{2\pi}$$

where:

- n is the principal quantum number (given as 2),
- h is Planck's constant (6.62×10^{-34} Js).

Substituting the value of n:

$$L = \frac{2h}{2\pi} = \frac{h}{\pi}$$

This matches option (D) in general form, since the angular momentum for any level n is $\frac{nh}{2\pi}$.

Quick Tip

In Bohr's atomic model, angular momentum is quantized and depends directly on the principal quantum number n.

---

47. If $L = 40\,\text{mH}$, $C = 100\,\mu\text{F}$, what is the angular frequency ω at resonance?

(A) 400

(B) 100

(C) 500

(D) 250

Correct Answer: (C) 500

Solution:

Resonant angular frequency is given by:

$$\omega = \frac{1}{\sqrt{LC}} = \frac{1}{\sqrt{40 \times 10^{-3} \times 100 \times 10^{-6}}} = \frac{1}{2 \times 10^{-3}} = 500\,\text{rad/s}$$

Quick Tip

At resonance, the inductive and capacitive reactances are equal, and $\omega = \frac{1}{\sqrt{LC}}$ gives the key frequency of the circuit.

48. What is the molar specific heat at constant volume C_V of a diatomic gas molecule if one additional vibrational degree of freedom is considered?

(A) $\frac{5}{2}R$

(B) $\frac{6}{2}R$

(C) $\frac{7}{2}R$

(D) $\frac{9}{2}R$

Correct Answer: (C) $\frac{7}{2}R$

Solution:

For a diatomic gas without vibrational modes, the degrees of freedom (D.O.F) = 5. With one vibrational mode added (which contributes 2 degrees of freedom), total D.O.F becomes 7. According to the equipartition theorem:

$$U = \frac{7}{2}RT$$

So,

$$C_V = \left(\frac{dU}{dT}\right) = \frac{7}{2}R$$

Quick Tip

Each vibrational mode contributes 2 degrees of freedom: one kinetic and one potential.

---

49. If the energy band gap is $0.72\,\text{eV}$, what is the wavelength of the emitted photon?

(A) $1.1\,\mu m$

(B) $1.4\,\mu m$

(C) $1.7\,\mu m$

(D) $2.0\,\mu m$

Correct Answer: (C) $1.7\,\mu m$

Solution:

Energy of photon is related to wavelength by:

$$E = \frac{hc}{\lambda} \Rightarrow \lambda = \frac{hc}{E}$$

Given:

$$E = 0.72\,\text{eV} = 0.72 \times 1.6 \times 10^{-19}\,\text{J}$$

$$h = 6.62 \times 10^{-34}\,\text{Js}, \quad c = 3 \times 10^{8}\,\text{m/s}$$

$$\lambda = \frac{6.62 \times 10^{-34} \times 3 \times 10^{8}}{0.72 \times 1.6 \times 10^{-19}} \approx 1.7\,\mu m$$

Quick Tip

Use the relation $\lambda(\mu m) = \frac{1.24}{E(\text{eV})}$ for quick approximations of wavelength in micrometers.

---

50. A current of $I = 20\,\mu$A flows in a long straight wire. What is the magnetic field B at a distance $r = 1\,$cm from the wire?

(A) $20 \times 10^{-11}\,$T

(B) $30 \times 10^{-11}\,$T

(C) $40 \times 10^{-11}\,$T

(D) $50 \times 10^{-11}\,$T

Correct Answer: (C) $40 \times 10^{-11}\,$T

Solution:

Magnetic field due to a long straight current-carrying wire at a distance r is given by:

$$B = \frac{\mu_0 I}{2\pi r}$$

Substitute:

$$\mu_0 = 4\pi \times 10^{-7}\,\text{T}\cdot\text{m/A}, \quad I = 20 \times 10^{-6}\,\text{A}, \quad r = 1\,\text{cm} = 1 \times 10^{-2}\,\text{m}$$

$$B = \frac{4\pi \times 10^{-7} \times 20 \times 10^{-6}}{2\pi \times 10^{-2}} = \frac{80 \times 10^{-13}}{10^{-2}} = 40 \times 10^{-11}\,\text{T}$$

Quick Tip

Use $B = \frac{\mu_0 I}{2\pi r}$ for magnetic field around a straight conductor — always check units!

---

51. In an inelastic collision, two bodies with masses $m_1 = 1\,\text{kg}$ and $m_2 = 3\,\text{kg}$ collide. Their initial velocities are $u_1 = 2\,\text{m/s}$ and $u_2 = 0\,\text{m/s}$, respectively. What is the change in kinetic energy (ΔK)?

(A) $1.0\,\text{J}$

(B) $1.2\,\text{J}$

(C) $1.5\,\text{J}$

(D) $2.0\,\text{J}$

Correct Answer: (C) $1.5\,\text{J}$

Solution:

In a perfectly inelastic collision, the final velocity v of the combined mass is:

$$v = \frac{m_1 u_1 + m_2 u_2}{m_1 + m_2} = \frac{1 \times 2 + 3 \times 0}{1 + 3} = \frac{2}{4} = 0.5\,\text{m/s}$$

Initial kinetic energy:

$$K_i = \frac{1}{2} m_1 u_1^2 + \frac{1}{2} m_2 u_2^2 = \frac{1}{2} \times 1 \times 2^2 + \frac{1}{2} \times 3 \times 0 = 2\,\text{J}$$

Final kinetic energy:

$$K_f = \frac{1}{2}(m_1 + m_2) v^2 = \frac{1}{2} \times 4 \times (0.5)^2 = \frac{1}{2} \times 4 \times 0.25 = 0.5\,\text{J}$$

Change in kinetic energy:

$$\Delta K = K_i - K_f = 2 - 0.5 = 1.5\,\text{J}$$

Quick Tip

In perfectly inelastic collisions, use conservation of momentum to find final velocity, then compare initial and final kinetic energies to find the loss.

---

52. A moon completes one revolution around the Earth in 27 days. If the size (mass) of the moon becomes four times its original size, what will be the new time period?

(A) 54 days

(B) 13.5 days

(C) 108 days

(D) 6.75 days

Correct Answer: (B) 13.5 days

Solution:

Time period for circular motion under gravity is given by:

$$T = \frac{2\pi r}{v}, \quad \text{and since} \quad v = \sqrt{\frac{GM}{r}}, \quad T = 2\pi\sqrt{\frac{r^3}{GM}}$$

If the mass of the orbiting body (moon) increases, centripetal force must match gravitational force:

$$\frac{GMm}{r^2} = \frac{mv^2}{r} \Rightarrow v = \sqrt{\frac{GM}{r}} \Rightarrow T \propto \frac{1}{\sqrt{m}}$$

Given:

$$T = 27 \text{ days}, \quad m' = 4m \Rightarrow T' = \frac{T}{\sqrt{4}} = \frac{27}{2} = 13.5 \text{ days}$$

Quick Tip

If mass increases by a factor n, and assuming central force conditions hold, the time period becomes $\frac{T}{\sqrt{n}}$.

---

53. 1 mole of oxygen is heated at constant pressure (1 atm) from $20^\circ C$ to $80^\circ C$, and then cooled from $80^\circ C$ to $20^\circ C$ at constant volume. If $C_p = 7.03$ cal/mol°C and $C_v = 5.04$ cal/mol°C, what is the difference between the heat supplied and the heat rejected?

(A) 302.4 cal

(B) 119.4 cal

(C) 421.8 cal

(D) 60.0 cal

Correct Answer: (B) $119.4\,\text{cal}$

Solution:

Heat supplied at constant pressure:

$$Q_s = nC_p\Delta T = 1 \times 7.03 \times (80 - 20) = 421.8\,\text{cal}$$

Heat rejected at constant volume:

$$Q_r = nC_v\Delta T = 1 \times 5.04 \times (80 - 20) = 302.4\,\text{cal}$$

Difference:

$$Q_s - Q_r = 421.8 - 302.4 = 119.4\,\text{cal}$$

Quick Tip

Always use the correct heat capacity based on the process type: use C_p for constant pressure and C_v for constant volume.

---

54. If the day before yesterday was Tuesday, what will be the day after tomorrow?

(A) Sunday

(B) Saturday

(C) Monday

(D) Thursday

Correct Answer: (B) Saturday

Explanation:

If the day before yesterday was Tuesday, then today is **Thursday**.

Hence, the day after tomorrow will be **Saturday**.

Quick Tip

In such questions based on days, first determine the current day, then count forward or backward as required.

55. Ram said, "Anu's mother is the only daughter of my mother." How is Anu related to Ram?

(A) Maternal Uncle

(B) Niece

(C) Aunt

(D) Father

Correct Answer: (B) Niece

Solution:

Let us analyze the statement step-by-step:

1. "Anu's mother is the only daughter of my mother" means:

$\rightarrow$ Ram's mother has only one daughter.

$\rightarrow$ That one daughter is Anu's mother.

So, Anu's mother is Ram's sister.

2. If Anu's mother is Ram's sister, then Anu is the daughter of Ram's sister.

Hence, by relationship, Anu is Ram's **niece**.

Relationship Chain:

Ram's mother $\Rightarrow$ only daughter (Ram's sister) $\Rightarrow$ Anu is her daughter $\Rightarrow$ Anu is Ram's niece.

Therefore, Anu is related to Ram as his **niece**.

Quick Tip

Whenever solving family-based logic questions, replace pronouns and names step-by-step to identify clear relationships. Drawing a simple family tree can also help.

56. Identify the odd one out in the sequence:

5, 7, 9, 12, 14, 16

(A) 5

(B) 7

(C) 12

(D) 14

Correct Answer: (C) 12

Solution:

Let's analyze the pattern:

- All numbers except 12 are either odd or follow a consistent pattern.
- 5, 7, 9 are consecutive **odd** numbers.
- 14, 16 are consecutive **even** numbers (in step of 2).
- But 12 breaks the pattern:
  - It is an even number placed between 9 (odd) and 14 (even).
  - If the pattern were fully odd or even separately, 11 or 13 would be expected.

Hence, **12** is the only number that disrupts the otherwise symmetric sequence.

Therefore, the odd one out in the sequence is **12**.

Quick Tip

Always observe sequences for patterns in parity (odd/even), differences, or positioning. Odd-one-out questions often hinge on one element not following the rule.

---

57. Seema earns 800 per week. After 30 days, her weekly income becomes ₹960. What is the percentage increase in her income?

(A) 10%

(B) 15%

(C) 20%

(D) 25%

Correct Answer: (C) 20%

Solution:

Initial weekly income = 800

New weekly income = ₹960

$$\text{Increase in income} = 960 - 800 = 160$$

$$\text{Percentage increase} = \left(\frac{160}{800}\right) \times 100 = 20\%$$

Therefore, the percentage increase in Seema's weekly income is **20%**.

Quick Tip

To find percentage increase, use the formula:

$$\text{Percentage Increase} = \left(\frac{\text{New} - \text{Old}}{\text{Old}}\right) \times 100$$
