DRDO CEPTAM-10 Memory Based Paper 3 (Held on 12 Nov 2022, Shift 1)

Q.1 **Which of the following statements is INCORRECT?**

A. There is a repulsive force when north poles (or south poles) of two magnets are brought close together.
B. If a bar magnet is broken into two halves, we get two similar bar magnets with stronger properties.
C. The earth behaves as a magnet with the magnetic field pointing approximately from the geographic south to the north.
D. When a bar magnet is freely suspended, it points in the north-south direction.

Answer: B

Sol: The correct answer is (b).
Explanation:
• Breaking a magnet results in two smaller magnets with the **same properties**, not stronger properties.
• Each piece develops its own north and south pole.
Information Booster:
• Like poles repel; unlike poles attract.
• Earth's magnetic south pole lies near geographic north.
• Magnetic compass works due to Earth's magnetism.
Additional Knowledge:
• Magnetic field is measured in Tesla (T).
• William Gilbert is known as the father of magnetism.

Q.2 **Which of the following is the number of oscillations per unit time of the sound wave?**

A. Wavelength
B. Time period
C. Amplitude
D. Frequency

Answer: D

Sol: **The correct answer is (d) Frequency.**
· **Frequency** is the number of **oscillations or vibrations per unit time** of a sound wave.
· It is measured in Hertz (Hz), and higher frequencies correspond to higher-pitched sounds.
Other Options:
· **Wavelength**: The distance between two consecutive points of a wave in the same phase, not the number of oscillations.
· **Time period**: The time taken for one complete oscillation, not the number of oscillations.
· **Amplitude**: The maximum displacement of a point on a wave from its rest position, not related to the number of oscillations per unit time.

Q.3 **Emperor Perumbidugu Mutharaiyar II belonged to which dynasty?**

A. Pallava
B. Chola
C. Pandya
D. Mutharaiyar

Answer: D

Sol:
The correct answer is (d) Mutharaiyar
Explanation:
· Emperor Perumbidugu Mutharaiyar II was a ruler of the Mutharaiyar dynasty.
· The dynasty ruled central Tamil Nadu between the 7th and 9th centuries CE.
Information Booster:
· The Mutharaiyars played a key transitional role before Chola imperial dominance.
Additional Knowledge :
(Mutharaiyar Dynasty)
· Ruled parts of Tiruchirappalli, Thanjavur, and surrounding regions.
· Often acted as feudatories before being absorbed into the Chola state.
· Known for irrigation tanks and temple patronage.
(Pallava Dynasty)
· Contemporary dynasty ruling northern Tamil Nadu from Kanchipuram.
(Pandya Dynasty)

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· Southern Tamil dynasty with Madurai as capital.
(Chola Dynasty)
· Rose to imperial power after the decline of Mutharaiyars in the 9th century CE.

Q.4 **The tissue providing nutrition to the embryo in the uterus is the _____.**

A. Fallopian tube
B. Oviduct
C. Placenta
D. Villi

Answer: C

Sol: The correct answer is: **(C) Placenta**
Explanation:

- The **placenta** is a special tissue that connects the developing embryo/fetus to the mother's uterine wall.
- It facilitates the **exchange of nutrients, gases, and wastes** between mother and fetus.
- It also secretes hormones like hCG, estrogen, and progesterone for pregnancy maintenance.

Information Booster:

- Placenta forms after implantation of the embryo in the uterus.
- Maternal blood and fetal blood do not mix directly; exchange occurs via diffusion.
- Umbilical cord connects the fetus to the placenta.
- Placenta acts as an endocrine gland during pregnancy.
- Provides oxygen and removes carbon dioxide from fetal blood.

Additional Knowledge:

- **Fallopian tube (A):** Site of fertilization, not nutrition.
- **Oviduct (B):** Another term for fallopian tube.
- **Villi (D):** Chorionic villi are part of the placenta but alone do not provide full nutrition.

Q.5 **_____ compound is used as a drying agent.**

A. Calcium oxide
B. Calcium carbide
C. Gypsum
D. Calcium carbonate

Answer: A

Sol: The correct answer is **(A) Calcium oxide**

Explanation:
• Calcium oxide (quicklime) readily reacts with water to form calcium hydroxide.
• It absorbs moisture efficiently, making it a powerful drying (desiccating) agent.
• Commonly used to keep laboratory apparatus and gases moisture-free.

Information Booster:
• Chemical formula: CaO.
• Also known as quicklime or burnt lime.
• Formed by heating limestone ($CaCO_3 \rightarrow CaO + CO_2$).
• Used in cement, glass, and steel industries.
• Exothermic reaction occurs when it combines with water.

Additional Knowledge:
• **Calcium carbide (CaC_2):** Used to produce acetylene gas, not as a drying agent.
• **Gypsum ($CaSO_4 \cdot 2H_2O$):** Used in plaster of Paris and cement; contains water of crystallization.
• **Calcium carbonate ($CaCO_3$):** A major component of limestone and marble; not hygroscopic.

Q.6 If the radius of curvature of a concave mirror is 6.2 cm, its focal length is _____ cm.

A. 12.4
B. 3.1
C. 2.6
D. 6

Answer: B

Sol: The correct answer is: **(B) 3.1**

Explanation:

- Formula:
- Given, Radius of Curvature (R) = 6.2 cm

$$f = \frac{}{} = 3.1\text{cm}$$

- Therefore, the focal length of the mirror is **3.1 cm**.

Information Booster:

- Concave mirror focal length is **half of its radius of curvature**.
- Focal point is where parallel rays converge after reflection.
- Uses: Shaving mirrors, dentist mirrors, solar cookers, headlights.
- Radius of curvature (R) is the distance between the **pole** and the **centre of curvature**.
- Relation: $R = 2f$.

Q.7 Consider the following statements:
1. Saturated hydrocarbons contain single bonds only.
2. Ethyne is an example of a saturated hydrocarbon.
3. Carbon can form long chain compounds due to catenation.

A. 1 and 2 only
B. 1 and 3 only
C. 2 and 3 only
D. All of the above

Answer: B

Sol: The correct answer is (b) 1 and 3 only

• Statement 1 is correct — saturated hydrocarbons (alkanes) have only single bonds.
• Statement 2 is incorrect — **ethyne (C_2H_2) is an alkyne**, which is **unsaturated** and contains a triple bond.
• Statement 3 is correct — carbon shows catenation, forming long chains and rings.

Information Booster:

• General formula of alkanes: C_nH_{2n+2}.
• Ethyne belongs to alkynes → general formula C_nH_{2n-2}.
• Catenation is the unique ability of carbon to form long chains and rings.
• Unsaturated hydrocarbons: alkenes (double bond) & alkynes (triple bond).
• Methane (CH_4) is the simplest saturated hydrocarbon.

Additional Knowledge:

• Carbon's valency = 4 (tetravalent).
• Functional groups change the properties of hydrocarbons.
• Hydrocarbons are classified as aliphatic and aromatic.
• Ethene (C_2H_4) is used for artificial ripening of fruits.

Q.8 _____ compound has –OH as a functional group.

A. Carboxylic acid
B. Ethanoic acid
C. Acetic acid
D. Alcohol

Answer: D

Sol: The correct answer is **(d) Alcohol**

Explanation:

- Compounds that have the **–OH (hydroxyl) functional group** are called **alcohols**.
- The –OH group is bonded to a carbon atom in the hydrocarbon chain.
- Alcohols are generally represented by the formula **R–OH**, where R is an alkyl group.
- Example: Ethanol (C_2H_5OH), Methanol (CH_3OH).

Information Booster:

- **Functional group:** –OH (hydroxyl group)
- **General formula:** R–OH
- **Example:** Ethanol, Methanol, Propanol
- **Used in:** Fuels, antiseptics, and solvents
- **Nature:** Polar and soluble in water due to hydrogen bonding

Additional Knowledge:

- **Carboxylic acids** contain the –COOH functional group (e.g., acetic acid).
- **Ethanoic acid** and **acetic acid** are the same compound (CH_3COOH) and contain –COOH, not –OH as the main functional group.
- **Alcohols**, unlike acids, do not release hydrogen ions in solution but can form hydrogen bonds.

Q.9 Which of the following is correct regarding M2?

A. M2 = Currency with the public (notes and coins) + Demand deposits + Other deposits with the Reserve Bank of India.
B. M2 = M3 + Total deposits with Post Office Savings Organization (excluding National Savings Certificates)
C. M2 = M1 + Time deposits of all commercial banks and cooperative banks (excluding inter-bank time deposits)
D. M2 = M1 + Post Office savings deposits

Answer: D

Sol: **The correct answer is: (d) M2 = M1 + Post Office savings deposits**

Explanation:

- M2 is a measure of money supply that includes M1 plus savings deposits in Post Offices.
- M1 consists of currency with the public + demand deposits + other deposits with RBI.
- Adding Post Office savings deposits to M1 gives M2.
- Thus, Option (d) correctly represents the formula for M2.

Information Booster:

- **M1 =** Currency with public + Demand deposits + Other deposits with RBI.
- **M2 =** M1 + Post Office Savings Deposits.
- **M3 =** M1 + Time Deposits of Commercial Banks.
- **M4 =** M3 + Total deposits with Post Office savings (excluding NSC).
- Money supply measures indicate liquidity levels in the economy.

Q.10 A car of mass m accelerates uniformly from rest under a constant force F. After traveling a distance d, what is the kinetic energy of the car?

A. $\frac{f \times d}{2}$
B. F×d
C. 2×F×d
D. $\frac{f \times d}{m}$

Answer: B

Sol: The correct answer **is (b)** $F \times d$

Explanation:

The **work-energy theorem** states that the **work done** on an object is equal to its **change in kinetic energy**:

$$W = \Delta KE$$

Since the car starts from rest, its **initial kinetic energy** is:

$$KE_{\text{initial}} = 0$$

The **work done** by the force F over a distance d is:

$$W = F \times d$$

Thus, the **final kinetic energy** of the car is:

$$KE_{\text{final}} = W = F \times d$$

Information Booster:

Kinetic Energy Formula:

$$KE = \frac{1}{2}mv^2$$

Work Done Formula:

$$W = F \times d \times \cos\theta$$

Since force FF and displacement dd are in the same direction, $\theta = 0^\circ, and \cos 0 = 1$, so:

$$W = F \times d$$

Relation Between Work and Kinetic Energy:

- The total work done on an object is equal to the change in kinetic energy.
- This concept is useful in **conservation of energy problems** and **mechanics**.

Q.11 'Alum' is an example of:

A. Flake salt
B. Table salt
C. Single salt
D. Double salt

Answer: D

Sol: The correct answer is **(D) Double salt**

Explanation:

● **Alum** is a **double salt** because it contains two different salts crystallized together — potassium sulfate (K_2SO_4) and aluminium sulfate ($Al_2(SO_4)_3$).

● Its common formula is **$K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$**.

Information Booster:

● Commonly known as **fitkari**.

● Used for water purification and as an astringent in shaving.

● Also used in textile dyeing and leather tanning.

● Type: Potassium aluminium sulfate dodecahydrate.

Additional Knowledge:

● Flake salt – large crystal form of sodium chloride.

● Table salt – pure sodium chloride (NaCl).

● Single salt – contains only one type of cation and anion (e.g., NaCl, KNO_3).

Q.12 **Which statement is NOT true for magnetic field lines?**

A. The relative strength of the magnetic field is shown by the degree of closeness of the field lines.
B. No two field lines are found to cross each other.
C. Inside the magnet, the direction of field lines is from its south pole to its north pole.
D. Magnetic field lines are not closed curves.

Answer: D

Sol: The correct answer is **(D) Magnetic field lines are not closed curves**.

Explanation:
Magnetic field lines are always **closed curves**. Outside the magnet, the field lines run from the **north pole to the south pole**, and inside the magnet, they run from the **south pole to the north pole**. This creates a continuous loop.

Information Booster:

- **Magnetic Field Lines**: They represent the direction of the magnetic field. The strength of the field is indicated by the **closeness of the lines**.
- **Field Line Behavior**: Magnetic field lines never **cross each other** because it would imply two different directions for the magnetic field at the same point.
- **Magnetic Poles**: The direction of magnetic field lines inside a magnet is from **south pole to north pole**.
- **Closed Curves**: Magnetic field lines are always **closed loops**, meaning they form a continuous path from one pole to the other, both inside and outside the magnet.
- **Earth's Magnetic Field**: The **Earth's magnetic field** behaves like a giant magnet with a magnetic **north** and **south pole**. The field lines run from the **magnetic south pole** to the **magnetic north pole** inside the Earth and from the **north pole to the south pole** outside.

Q.13 **If a person moves a trolley for a distance of 10 m with a force of 50 N, then the work done is:**

A. 0.2J
B. 5J
C. 20J
D. 500J

Answer: D

Sol: **Correct Answer:** (d) 500 J

Explanation:
• The formula for **work done (W)** is $W=F\times d\times\cos\theta$
• Here, F=50 N, , d=10 m, and since force and displacement are in the same direction, $\cos\theta=1$.
• Substituting values: $W=50\times10\times1=500$ J

Information Booster:
• The **SI unit of work** is **joule (J)**.
• 1 joule = work done when 1 newton of force moves an object 1 metre in the direction of force.
• Work is **positive** when force and displacement are in the same direction.
• Work is **zero** if the displacement is perpendicular to the force.
• Work is **negative** when force acts opposite to the direction of motion.

Q.14 **What is the primary purpose of pedigree analysis in the context of genetics?**

A. To measure the physical traits of individuals in a population
B. To track the inheritance of specific traits across generations within a family
C. To analyse the nutritional requirements of different organisms
D. To study the ecological interactions between species in an environment

Answer: B

Sol: The correct answer is: **(b) To track the inheritance of specific traits across generations within a family**.

• **Pedigree analysis** is used in genetics to trace the inheritance of specific traits or genetic disorders within a family.

• It is typically represented in a chart form, with each individual's genetic traits being marked across multiple generations to study inheritance patterns and predict the probability of genetic conditions in future generations.

Information Booster:

• Pedigree analysis is an essential tool in genetic counseling and in diagnosing inherited diseases.

• It helps geneticists and doctors understand whether a genetic disorder is dominant, recessive, or sex-linked, aiding in informed decision-making.

Additional Knowledge:

· **(a)To measure the physical traits of individuals in a population**: Pedigree analysis is not used to measure physical traits directly; it focuses on the inheritance of genetic traits, not the expression of physical traits.

· **(c) To analyse the nutritional requirements of different organisms**: This is a different field of study called **nutritional science** and is not related to pedigree analysis in genetics.

· **(d) To study the ecological interactions between species in an environment**: This relates to **ecology**, not genetics or pedigree analysis.

Q.15 India is a member of which of the following groups?

1. G-20
2. BRICS
3. OECD
4. SCO

A. 1, 2 and 3 only
B. 1, 2 and 4 only
C. 2, 3 and 4 only
D. 1, 2, 3 and 4

Answer: B

Sol: The correct answer is (b) 1, 2 and 4 only.

• India is a member of **G-20**, **BRICS**, and **SCO (Shanghai Cooperation Organisation)**, but **not** of the **OECD (Organisation for Economic Co-operation and Development)**.

Information Booster:

• **G-20:** Major economies; formed 1999; India hosted **2023 Summit** (New Delhi).

• **BRICS:** Brazil, Russia, India, China, South Africa (founded 2009).

• **SCO:** Founded 2001; India and Pakistan joined in 2017.

• **OECD:** Mainly high-income economies (HQ – Paris).

Additional Knowledge:

• G-20 represents **85% of global GDP**, **75% of trade**, **2/3rd of population**.

• SCO HQ – **Beijing, China**.

• BRICS New Development Bank HQ – **Shanghai**.

• OECD has 38 member nations (mostly developed).

Q.16 Which of the following industries was **NOT** included in Schedule A of the Industrial Policy Resolution, 1956?

A. Atomic Energy
B. Aircraft
C. Fertiliser
D. Ship Building

Answer: C

Sol: The correct answer is (c) **Fertiliser.**

Explanation:

• The **Industrial Policy Resolution (IPR), 1956** classified industries into three Schedules — A, B, and C.

• **Schedule A** included industries exclusively owned and operated by the State, such as **atomic energy, aircraft, arms, and shipbuilding.**

• **Fertiliser** was placed in **Schedule B**, where both public and private sectors could participate.

Information Booster:

• **Adopted on:** April 30, 1956.

• **Main Objective:** Establish a socialistic pattern of society.

• **Schedule A:** 17 industries reserved for the public sector.

• **Schedule B:** 12 industries where both sectors could operate, with state predominance.

• **Schedule C:** Remaining industries left to the private sector.

Additional Knowledge:

• **Key Schedule A industries:** Atomic energy, railways, arms & ammunition, aircraft, shipbuilding, and iron & steel.

• **Fertiliser** industry moved to the joint sector later under subsequent industrial policies.

• The **1956 Policy** laid the foundation for India's **mixed economy** model.

• It replaced the **Industrial Policy of 1948** and remained effective until the **Industrial Policy of 1991.**

• The policy's guiding principle: "Commanding heights of the economy should be under the public sector."

Q.17 What was the unknown element under aluminium called?

A. Neo-Aluminium
B. Proto-Aluminium
C. Eka-Aluminium
D. Meta-Aluminium

Answer: C

Sol: The correct answer is **(C) Eka-Aluminium**
Explanation:

- The **unknown element** that was predicted to exist **below aluminium** in the periodic table was referred to as **Eka-Aluminium**.
- The term **Eka-Aluminium** was coined by the famous chemist **Dmitri Mendeleev** in **1869** when he formulated the **Periodic Table of Elements**.
- Mendeleev predicted that there was an element with properties similar to aluminium but with a higher atomic mass, and he placed it in the periodic table in the position below aluminium, which was not yet discovered at the time.
- This element was later identified as **Gallium** in **1875** by **Paul-Émile Lecoq de Boisbaudran**, confirming Mendeleev's prediction.

Information Booster:

- **Eka-Aluminium** means "one beyond aluminium" (Eka means "one" in Sanskrit), reflecting Mendeleev's prediction of an element in the same group as aluminium, but with a higher atomic number.
- **Gallium (Ga)** was discovered after the prediction and is chemically similar to aluminium, matching the properties Mendeleev had foreseen for **Eka-Aluminium**.

Additional Knowledge:

- **Neo-Aluminium**: This term is not associated with any known element in the periodic table.
- **Proto-Aluminium**: This term is also not used in the context of element predictions.
- **Meta-Aluminium**: Like the other terms, it is not a recognized term in the history of the periodic table.

Q.18 Which of the following laboratory safety equipments is used to extinguish small fires ?

A. Laboratory
B. Blanket
C. Safety goggles
D. Fire extinguisher

Answer: D

Sol: The correct answer is: **(d) Fire extinguisher**
Explanation:
· A **fire extinguisher** is the standard lab safety equipment used to extinguish small fires.
· Different types (CO_2, dry powder, foam, water) are used depending on the class of fire.
· In laboratories, **CO_2 or dry powder extinguishers** are most common because they are effective on chemical and electrical fires.
Information Booster:
· Fire extinguishers must be easily accessible and regularly maintained.
· Small chemical fires can also be smothered with a **fire blanket** if available.
· Fire safety training is essential for all lab personnel.
· Fire extinguishers are classified as Class A (wood/paper), B (liquid), C (gas/electric), D (metal), K (kitchen oils).
· CO_2 extinguishers leave no residue, making them useful in labs with sensitive instruments.

Q.19 Which of the following is an example of animal hormones?
I. Adrenalin
II. Testosterone

A. Only II
B. Only I
C. Neither I nor II
D. Both I and II

Answer: D

Sol: The correct answer is (D) Both I and II
Explanation:

- **Statement I: Adrenalin – Correct**
  - Also called **Epinephrine**, adrenalin is a hormone secreted by the **adrenal medulla** (part of adrenal glands).
  - It is responsible for the "**fight-or-flight response**," increasing heart rate, blood flow, and energy supply in emergency situations.
- **Statement II: Testosterone – Correct**
  - Testosterone is the **primary male sex hormone**, secreted mainly by the **testes** and in small amounts by the **adrenal glands** in both sexes.
  - It regulates development of male reproductive tissues, secondary sexual characteristics, and influences behavior.

Thus, **both are animal hormones**.

Information Booster:

- **Hormones:** Chemical messengers secreted by endocrine glands to regulate physiology and behavior.
- **Other Examples of Animal Hormones:**
  - **Insulin** (pancreas – regulates blood sugar)
  - **Thyroxine** (thyroid gland – controls metabolism)
  - **Progesterone & Estrogen** (ovaries – female reproductive hormones)
  - **Cortisol** (adrenal gland – stress hormone)
- **Key Difference:**
  - **Plant hormones (phytohormones):** Auxins, Gibberellins, Cytokinins, Abscisic acid, Ethylene.
  - **Animal hormones:** Adrenalin, Insulin, Testosterone, Estrogen, Thyroxine, etc.

Q.20 **Which of the following has disinfectant properties? A. Amphoteric surfactant B. Evaporative cleaner C. Cationic detergent**

A. Only C
B. A and B
C. Only A
D. A and C

Answer: A

Sol: The correct answer is: (a) Only C

Explanation:
• **Cationic detergents** have **disinfectant and germicidal properties** because they contain quaternary ammonium compounds (quats) that destroy microbial cell membranes.
• These compounds are commonly used in antiseptics, disinfectants, and mouthwashes.

Information Booster:
• Cationic detergents are positively charged and effective against Gram-positive bacteria.
• Common examples: **Cetyltrimethylammonium bromide** and **Benzalkonium chloride**.
• They are used in hospitals, food industries, and water treatment processes.
• Amphoteric surfactants can act as both acids and bases but are **mild cleaners**, not disinfectants.
• Evaporative cleaners mainly remove dirt and dust through solvents and **lack germicidal action**.

Additional Knowledge:
• **Amphoteric surfactant:** Found in shampoos and skin cleansers; safe for human use but not disinfectant.
• **Evaporative cleaner:** Used for surface cleaning where quick drying is needed; no antimicrobial property.
• **Cationic detergent:** Effective for disinfection, fabric softening, and sterilization purposes.

Q.21 **Which of the following modern physicist closely examined Newtonian mechanics' foundations?**

A. James Clerk Maxwell
B. Ernst Mach
C. Galileo Galilei
D. Albert Einstein

Answer: D

Sol: Correct Answer:D) Albert Einstein

Explanation:

- **Albert Einstein** closely re-examined the **foundations of Newtonian mechanics** through his theories of **Special Relativity (1905)** and **General Relativity (1915)**.
- He challenged Newton's concepts of **absolute space, absolute time, and gravitational force**, replacing them with relativity-based ideas such as **spacetime**, **mass–energy equivalence**, and **gravity as curvature of spacetime**.

Information Booster:

- Einstein showed that Newton's laws **break down at high speeds and strong gravitational fields**.
- His work established modern theoretical physics and redefined fundamental concepts like **motion, gravity, simultaneity, and inertial frames**.
- Relativity unified space and time into a single framework: **4-dimensional spacetime**.

Additional Knowledge :

A) James Clerk Maxwell

- Developed the **Maxwell's equations** that unified electricity and magnetism.
- His work actually **exposed conflicts** between electromagnetism and Newtonian mechanics, indirectly motivating Einstein, but he did not systematically critique Newtonian foundations.

B) Ernst Mach

- Critic of Newton's **absolute space and time**; proposed **Mach's Principle**.
- Influenced Einstein philosophically, but Mach himself **did not reformulate physics mathematically** like Einstein did.

C) Galileo Galilei

- Lived before Newton; laid the **early foundations** of mechanics (laws of motion, inertia).
- Did not critique Newtonian mechanics because it **did not exist yet** during his time.

Q.22 **A sound wave with a period of 0.01 seconds has a frequency of:**

A. 1000 Hz
B. 10 Hz
C. 0.1 Hz
D. 100 Hz

Answer: D

Sol: **The correct answer is (D) 100 Hz**

Explanation:

- Frequency (f) = **1 / Period (T)**
- Given: T = **0.01 seconds**
- So, f = **1 / 0.01 = 100 Hz**

Information Booster:

- Frequency is measured in **Hertz (Hz)**, meaning cycles per second.
- Higher frequency → higher pitched sound.
- Audible range for humans: **20 Hz to 20,000 Hz**.

Additional Knowledge:

- Sound is a **mechanical wave** that needs a **medium** to travel.
- It cannot travel in **vacuum**.
- Sound waves are **longitudinal** in air.
- Speed of sound in air ≈ **343 m/s** at 25°C.
- Speed increases in **solids > liquids > gases**.
- Frequency = **1 / Period**.
- Unit of frequency = **Hertz (Hz)**.
- Audible range for humans: **20 Hz – 20,000 Hz**.
- <20 Hz → **Infrasonic**; >20,000 Hz → **Ultrasonic**.
- Amplitude decides **loudness** of sound.
- Frequency decides **pitch** of sound.
- Reflection of sound leads to **echo**.
- Echo is heard only if the reflecting surface is **≥17 m** away.
- SONAR uses **ultrasound** for underwater detection.

Q.23 **Which of the following is CORRECT regarding Ohm's law?**

A. R = V
B. V ∝ I
C. R ∝ I
D. V = I

Answer: B

Sol: **Correct Answer: (b) V ∝ I**

Explanation

- Ohm's Law states that **Voltage (V) is directly proportional to Current (I)** when temperature and other physical conditions remain constant.

V=IR

- This means if current increases, voltage increases proportionally.

Information Booster

- **R = constant** for an ohmic conductor.
- Used to calculate resistance, voltage, or current in basic electric circuits.

Additional Knowledge

- Materials obeying Ohm's law = **Ohmic conductors** (e.g., metals).
- Materials NOT obeying Ohm's law = **Non-ohmic conductors** (e.g., diode, filament lamp).

Q.24 **_____ are those errors that tend to be in one direction, either positive or negative.**

A. Random error
B. Systematic error
C. Instrumental error
D. Personal error

Answer: B

Sol: **Correct Answer: (b) Systematic error**

Explanation

- **Systematic errors** are consistent, repeatable errors that occur in **one direction only**—either always positive or always negative.
- They arise from **faulty instruments, incorrect calibration, consistent observer bias, or fixed experimental conditions**.

Information Booster

- These errors **affect accuracy**, not precision.
- Unlike random errors, systematic errors **do NOT cancel out** on averaging.

Additional Knowledge

- Common types of systematic errors:
  - **Instrumental errors** (zero error, calibration error)
  - **Personal errors** (consistent reading habit)
  - **Environmental errors** (temperature, humidity influence)

Q.25 **In 1995, physicists Eric Cornell and Carl Wieman created the first Bose-Einstein condensate (BEC) using which isotope?**

A. Caesium-133
B. Thorium-232
C. Rubidium-87
D. Sodium-23

Answer: C

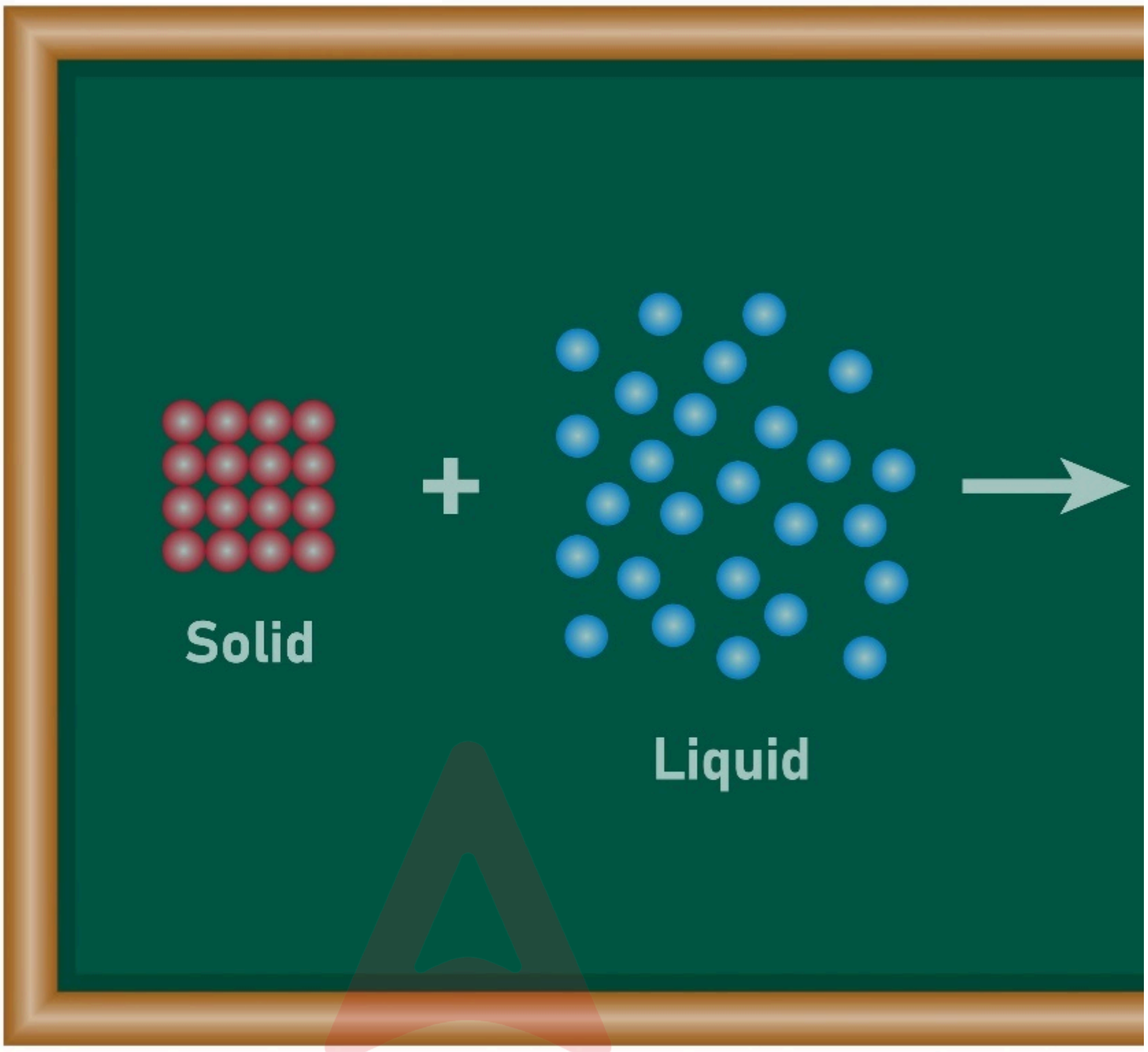
Sol:

The correct answer is (c) Rubidium-87.

Explanation:

· **Bose–Einstein Condensate (BEC):** A state of matter that occurs when a gas of **bosons** is cooled to temperatures very near **absolute zero** (typically less than a

· At this temperature, a large fraction of the bosons occupy the lowest quantum state, and quantum mechanical effects become apparent on a macroscopic sca



· **Discovery:** In 1995, **Eric Cornell** and **Carl Wieman**, along with their team at JILA in Colorado, successfully created the first true BEC using a gas of approximate
· **Significance:** This experimental realization confirmed a prediction made by **Albert Einstein** and **Satyendra Nath Bose** in the 1920s. For this achievement, Corr
were awarded the **Nobel Prize in Physics in 2001**.
Information Booster:
· **Isotopes Used:**
· **Rubidium-87 (Rb-87):** Used by Cornell and Wieman for the first BEC.
· **Sodium-23 (Na-23):** Used by **Wolfgang Ketterle** and his team at MIT to create another BEC soon after.
· **Method:** They used a combination of **laser cooling** (to slow the atoms down) and **evaporative cooling** (to selectively remove the hottest atoms) to reach the

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Q.26 **An alloy with _____ in it is referred to as 'amalgam'.**

A. nickel
B. silver
C. mercury
D. cobalt

Answer: C

Sol: **The correct answer is (C) mercury**

Explanation:

- An **amalgam** is an **alloy that contains mercury** as one of its components.
- Amalgams are commonly used in **dentistry**, especially for dental fillings, because they are strong, durable, and easy to mold when first applied.

Common Examples:

- **Dental amalgam:** Mercury + silver + tin + copper
- **Gold amalgam:** Used historically for gold extraction

Information Booster:

- Mercury forms alloys with many metals like **silver, gold, tin**, and **zinc**.
- Metals that **do NOT form** amalgams include **iron and platinum**.
- Because mercury is liquid at room temperature, it easily mixes with other metals, forming soft alloys.
- Due to toxicity concerns, many countries are reducing the use of mercury-based amalgams.

Q.27 **Which secret society founded by Vinayak Damodar Savarkar promoted armed revolution against the British rule?**

A. Abhinav Bharat
B. Anushilan Samiti
C. Hindustan Socialist Republican Association
D. Ghadar Party

Answer: A

Sol: **The correct answer is (A) Abhinav Bharat**

Explanation:

- **Abhinav Bharat Society** was founded in **1904** by **Vinayak Damodar Savarkar** and his brother Ganesh Savarkar.
- It promoted **armed revolution** and nationalist propaganda against British colonial rule.
- The society later merged with other revolutionary groups and influenced future revolutionaries.

Information Booster:

- Founded in **Nasik, Maharashtra**.
- Inspired by **Italian revolutionary Giuseppe Mazzini**.
- Savarkar also authored **'The Indian War of Independence – 1857'**.
- Members used **secret oaths and coded communication**.
- British banned Abhinav Bharat in **1910**.

Additional Knowledge:

- Anushilan Samiti – Revolutionary group based in Bengal.
- HSRA – Founded by Bhagat Singh & Chandrashekhar Azad (1928).
- Ghadar Party – Founded in USA & Canada to overthrow British rule.

Q.28 **The potential difference between the terminals of an electric heater is 60 V when it draws a current of 4 A from the source. What current will the heater draw if the potential difference is changed to 127.5 V?**

A. 8.5 A
B. 24 A
C. 10 A
D. 12 A

Answer: A

Sol: **Correct Answer: (A) 8.5 A**

Explanation:

- Resistance of heater = V/I = 60 ÷ 4 = 15 Ω.
- When voltage changes, resistance remains constant (Ohm's Law).
- New current = 127.5 ÷ 15 = **8.5 A**.

Information Booster:

- Ohm's Law: V = IR.
- **V** = Potential difference (voltage), **I** = Current, **R** = Resistance.
- Resistance of a device stays constant at constant temperature.
- Current is directly proportional to voltage for a fixed resistance.
- Electric heater's resistance is designed to produce heat via Joule heating.
- Higher voltage → higher current for same resistance.
- For a constant temperature, current is directly proportional to voltage.
- If voltage increases, current increases (when resistance is constant).
- Resistance is the opposition offered to the flow of electric current.
- SI unit: V (volt) for voltage, A (ampere) for current, Ω (ohm) for resistance.

Q.29 **Element X forms an oxide with the formula X_2O_3.The element X would most likely be in the same group of the periodic table as_____**

A. magnesium
B. silicon
C. aluminium
D. sodium

Answer: C

Sol: The correct answer is **(c) Aluminium**

Explanation:

- X_2O_3 shows element X has +3 oxidation state.
- +3 oxidation state is characteristic of Group 13 elements.
- Aluminium forms Al_2O_3, same pattern as X_2O_3.
- Hence, X belongs to the same group as Aluminium.

Information Booster:

- M_2O_3-type oxides indicate +3 valency.
- Group 13 elements (B, Al, Ga) commonly show +3 oxidation state.
- Al_2O_3 is amphoteric.
- Magnesium forms MgO (+2), not M_2O_3.
- Sodium forms Na_2O (+1), not M_2O_3.

Additional Knowledge:

- Magnesium (Group 2) → MgO (valency +2).
- Silicon (Group 14) → SiO_2 (does not match X_2O_3).
- Sodium (Group 1) → Na_2O (valency +1).

Q.30 **What is the work done when a constant force of 20 N is applied at an angle of 30° to the direction of displacement of 13 m?**

A. 390 Joules
B. 225 Joules
C. 260 Joules
D. 185 Joules

Answer: B

Sol: The correct answer is **(B) 225 Joules.**

Explanation:

Work done (W) is calculated using the formula:

$W = F \times d \times \cos(\theta)$

Where:

- **F** is the applied force (20 N)
- **d** is the displacement (13 m)
- **θ** is the angle between the force and the displacement (30°)

Substitute the values:

$W = 20 \times 13 \times \cos(30°)$

Since **$\cos(30°) = \sqrt{3}/2 \approx 0.866$**, the calculation becomes:

$W = 20 \times 13 \times 0.866 \approx 225$ Joules

Information Booster:

- **Work** is a scalar quantity and is positive when the force has a component in the direction of displacement.
- The angle θ affects the amount of work done: if θ = 0°, all of the force contributes to the work.
- The formula **$W = F \times d \times \cos(\theta)$** accounts for the directionality of the applied force relative to the displacement.

Additional Knowledge:

- **Cosine of an angle**: The cosine function gives the ratio of the adjacent side (force in the direction of displacement) to the hypotenuse (the total applied force).
- **Unit of Work**: The SI unit of work is the **Joule (J)**, where 1 Joule = 1 N·m.
- **Energy Transfer**: Work done is a form of energy transfer from the source to the object.

Q.31 **The enzyme ..... present in the pancreatic juice, converts proteins to amino acids.**

A. Pepsin
B. Lipase
C. Trypsin
D. Amylase

Answer: C

Sol: The correct answer is (c) **Trypsin**.

- Pancreatic juice contains enzymes like **trypsin, lipase, and amylase**.
- **Trypsin** helps break down proteins into smaller peptides and eventually amino acids.
- It is secreted as an inactive precursor **trypsinogen**, which is activated in the small intestine by **enterokinase**.

Information Booster:
• **Pepsin** is secreted in the stomach, not in pancreatic juice.
• **Lipase** digests fats into fatty acids and glycerol.
• **Amylase** digests starch into maltose (a sugar).
• Pancreatic juice plays a crucial role in **digestion in the duodenum**.
• Trypsin works best in an **alkaline medium** (pH ~8).

Additional Knowledge:
• **Pepsin** → Breaks proteins into peptides in stomach (acidic medium).
• **Lipase** → Breaks fats into fatty acids and glycerol in small intestine.
• **Amylase** → Converts starch into maltose in mouth (salivary amylase) & small intestine (pancreatic amylase).
• **Trypsin** → Main pancreatic enzyme for protein digestion into amino acids.

Q.32 **Which Article of the Indian Constitution was amended by the 106th Constitutional Amendment Act to provide for women's reservation in the Legislative Assembly of Delhi?**

A. Article 330A
B. Article 243D
C. Article 239AA
D. Article 332A

Answer: C

Sol:

The correct answer is (c) Article 239AA
Explanation:
• The 106th Constitutional Amendment Act (Nari Shakti Vandan Adhiniyam) introduced women's reservation in Lok Sabha, State Assemblies, and the Legislative Assembly of the NCT of Delhi.
• To implement this reservation specifically for Delhi, Article 239AA—which contains special provisions for the governance and structure of Delhi's Legislative Assembly—was amended.
• A new clause (2A) was inserted into Article 239AA to provide for 33% reservation for women in the Delhi Assembly.
• Article 239AA gives Delhi a unique status as a Union Territory with its own legislature.
• The reservation will come into effect after the next delimitation exercise.
Information Booster:
• The 106th Amendment introduced:
– Article 330A → Women's reservation in Lok Sabha.
– Article 332A → Women's reservation in State Legislative Assemblies.
– New clause in Article 239AA → Women's reservation in Delhi Assembly.

• Implementation is linked to the first census after 2026 and subsequent delimitation.

Additional Knowledge:

Article 330A (Option a)

. Provides reservation for women in the Lok Sabha, not specific to Delhi Assembly.

Article 243D (Option b)

. Deals with reservation in Panchayats, unrelated to State/UT legislatures.

Article 332A (Option d)

. Provides reservation for women in State Legislative Assemblies, but does not apply to the NCT of Delhi.

Q.33 **What is Karst topography primarily associated with?**

A. Groundwater action in limestone or dolomite regions
B. River meandering in alluvial plains
C. Glacial deposition in polar regions
D. Wind erosion in arid deserts

Answer: A

Sol: The correct answer is (a) **Groundwater action in limestone or dolomite regions.**

• Karst topography is formed due to **chemical weathering (solution and carbonation)** of **limestone and dolomite rocks** by groundwater, creating features like sinkholes, caves, and underground streams.

Information Booster:

• Named after the **Karst region of Slovenia and Italy**.
• Major features: **stalactites, stalagmites, dolines, and limestone caverns**.
• Common in **Meghalaya (Krem Liat Prah Caves)** and **Visakhapatnam (Borra Caves)**.
• Carbonic acid from rainwater dissolves **calcium carbonate ($CaCO_3$)**.
• Represents **fluvial-erosional landform under subsurface drainage**.

Additional Knowledge:

• Karst regions are rich in **groundwater aquifers**.
• Found in **Yunnan (China)** and **Appalachians (USA)** globally.
• Studied under **geomorphology** in physical geography.

Q.34 **Which of the following inert gases is placed in period 4 of the periodic table?**

A. Kr
B. Rn
C. Xe
D. Ar

Answer: A

Sol: The correct answer is: **A) Kr (Krypton)**

Explanation:

• **Krypton (Kr)** is a **noble (inert) gas** found in **Period 4** and **Group 18** of the periodic table.
• It has **atomic number 36**.
• Its outermost electron configuration is **$4s^2\ 4p^6$**, making it chemically inert and stable.

Information Booster:

• The **inert gases (noble gases)** are: He, Ne, Ar, Kr, Xe, and Rn.
• All inert gases have **completely filled outer electron shells**.
• **Krypton** is used in **high-speed photography and fluorescent lamps**.
• The **boiling point** of krypton is **−153.4°C**.
• It was discovered in **1898 by Ramsay and Travers**.

Additional Knowledge:

• **He (Helium)** – Period 1, Atomic No. 2.
• **Ne (Neon)** – Period 2, Atomic No. 10.
• **Ar (Argon)** – Period 3, Atomic No. 18.
• **Xe (Xenon)** – Period 5, Atomic No. 54.
• **Rn (Radon)** – Period 6, Atomic No. 86.

Q.35 **Plants in the ..... group are commonly called algae.**

A. Bryophyta
B. Thallophyta
C. Gymnosperms
D. Pteridophyta

Answer: B

Sol: The correct answer is: **(B) Thallophyta**

Explanation:

- Plants in the **Thallophyta group** are commonly called **algae**.
- They are **simple, primitive plants** with a thallus-like body, meaning they do not have true roots, stems, or leaves.
- They are **autotrophic** (contain chlorophyll) and mostly found in **aquatic habitats**.

Information Booster:

- Examples: **Spirogyra, Ulva, Chlamydomonas, Volvox**.
- Algae are classified into **green, brown, and red algae**.
- They play a major role in producing **oxygen** and form the base of aquatic food chains.
- Some algae (e.g., **Porphyra, Laminaria, Chlorella**) are used as food and in industries.

Additional Knowledge:

- **Bryophyta (A):** Includes mosses and liverworts; first land plants with true alternation of generations.
- **Gymnosperms (C):** Seed-producing plants with naked seeds (e.g., pine, cycas).
- **Pteridophyta (D):** Vascular cryptogams like ferns, with true roots, stems, and leaves but no seeds.
- Thallophyta is part of the **Cryptogams**, plants that reproduce by spores and lack flowers and seeds.

Q.36 **Which of the following instruments is primarily used by the RBI for monetary policy implementation in the post 1991 reform era?**

A. Repo rate
B. Export incentives
C. Tariff rates
D. Direct taxes

Answer: A

Sol: **The correct answer is (A) Repo rate**

Explanation:

- In the post-1991 reform era, the **RBI primarily uses the Repo Rate** as its key monetary policy instrument.
- Repo rate changes directly influence money supply, lending rates, and inflation control.
- It replaced earlier quantitative controls and became the central tool under the modern monetary framework.

Information Booster:

- Monetary Policy Committee (MPC) decides repo rate since 2016.
- Reverse repo rate works as the lower bound of the liquidity corridor.
- Post-reform RBI shifted from direct to market-based instruments.
- Repo operations are done through the Liquidity Adjustment Facility (LAF).
- Inflation targeting (4% ± 2%) guides monetary decisions.

Additional Knowledge:

- **Export incentives** – Trade policy tools.
- **Tariff rates** – Part of fiscal and trade policy.
- **Direct taxes** – Levied by the government (CBDT)

Q.37 **Education is now placed under which list after the 42nd Amendment?**

A. Union List
B. State List
C. Concurrent List
D. Judicial List

Answer: C

Sol: The correct answer is (c) Concurrent List.

- The 42nd Constitutional Amendment Act, 1976 shifted Education from the State List to the Concurrent List.
- Both Union and States can legislate on education.

Information Booster

- Education appears as Entry 25 in the Concurrent List.
- Amendment is also called the Mini Constitution.

• Implemented during the Emergency period (1975–77).
• Right to Education later became a Fundamental Right via 86th Amendment, 2002.
Additional Knowledge
• Article 21A provides free and compulsory education (6–14 years).
• Higher education institutions include UGC (1956) and AICTE (1987).
• States manage school education implementation.
• Centre frames national policies like NEP 2020.

Q.38 **Calcium sulfate hemihydrate is also known as:**

A. Baking powder
B. Baking soda
C. Washing soda
D. Plaster of Paris

Answer: D

Sol: The correct answer is **(d) Plaster of Paris**
Explanation:
• **Calcium sulfate hemihydrate ($CaSO_4 \cdot \frac{1}{2}H_2O$)** is commonly known as **Plaster of Paris (POP)**.
• It is obtained by heating **gypsum ($CaSO_4 \cdot 2H_2O$)** at around **373 K (100°C)**, which removes part of its water content.
• When mixed with water, it quickly sets into a hard solid — **gypsum** — which makes it useful for molding, casting, and medical applications.

Information Booster:
• **Chemical Formula:** $CaSO_4 \cdot \frac{1}{2}H_2O$
• **Common Name:** Plaster of Paris
• **Preparation:** Gypsum → Heat at 373 K → POP
• **Uses:**
– Making casts, molds, and sculptures
– Setting fractured bones (medical bandages)
– Decorative ceiling and wall designs
• **Reversible Reaction:** POP + Water → Gypsum ($CaSO_4 \cdot 2H_2O$)

Additional Knowledge:
• **Baking powder:** Mixture of baking soda and acid; used in cooking.
• **Baking soda:** Sodium bicarbonate ($NaHCO_3$); used as a leavening agent.
• **Washing soda:** Sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$); used in cleaning and water softening.

Q.39 **A compound has an empirical formula CH_2 and a molar mass of 56 g/mol. Its molecular formula is:**

A. C_2H_4
B. C_3H_6
C. CH_2
D. C_4H_8

Answer: D

Sol: The correct answer is **(D) C_4H_8**
Explanation:

- The **empirical formula** of the compound is **CH_2**, and the **molar mass** is given as **56 g/mol**.
- The molar mass of the empirical formula **CH_2** is:
  - **C (12 g/mol)** + **H_2 (2 × 1 g/mol)** = **14 g/mol**.
- Now, divide the **molar mass of the compound (56 g/mol)** by the **molar mass of the empirical formula (14 g/mol)**:
  - **56 g/mol ÷ 14 g/mol = 4**.
- Therefore, the **molecular formula** is **4 times** the empirical formula:
  - **$(CH_2)_4 = C_4H_8$**.

Information Booster:

- The **molecular formula** represents the actual number of atoms in a molecule, and it is a **multiple of the empirical formula**.
- In this case, **CH_2** is the empirical formula, and the molecular formula is **C_4H_8** (since 4 times the empirical formula gives the correct molar mass of 56 g/mol).

Q.40 **Which of the following correctly represents the chronological order of human development during gestation?**

A. Embryo Zygote Fetus
B. Fetus Embryo Zygote
C. Zygote Embryo Fetus
D. Zygote Fetus Embryo

Answer: C

Sol: The correct answer is (c) Zygote → Embryo → Fetus

Explanation:

• The process of human development begins with the formation of a zygote after fertilization.

• The zygote undergoes multiple cell divisions and develops into an embryo during the first 8 weeks.

• After about the 9th week until birth, the developing organism is referred to as a fetus.

• Thus, the correct developmental sequence is: Zygote → Embryo → Fetus.

• This sequence is universally accepted in embryology and human biology.

Information Booster:

• **Zygote:** A single cell formed by the union of sperm and egg (diploid stage).

• **Embryo:** Stage from 2-cell division to 8 weeks, characterized by organ formation (organogenesis).

• **Fetus:** Stage from 9 weeks to birth, where growth and functional development occur.

• Human gestation lasts about 40 weeks (9 months).

• The placenta supports the embryo/fetus with nutrients and oxygen.

Q.41 **As per the Calcutta High Court (Extension of Jurisdiction) Act, 1953, the jurisdiction of the Calcutta High Court was extended to cover which of the following areas?**

A. The state of Sikkim
B. Dadra and Nagar Haveli, and Daman and Diu
C. Union Territory Lakshadweep and Puducherry
D. Chandannagar, and Andaman and Nicobar Islands

Answer: D

Sol: **The correct answer is: (d) Chandannagar, and Andaman and Nicobar Islands Explanation:**

· The 1953 Act extended the jurisdiction of the Calcutta High Court to the Union Territories of Andaman and Nicobar Islands and the former French territory of Chandannagar.

Information Booster:

· The Calcutta High Court was one of the first high courts in India.
· The extension of its jurisdiction helped standardize legal proceedings in these regions.
· Chandannagar was a French colony before being incorporated into India in 1954.

Additional Knowledge:

· **(a) The state of Sikkim**: Sikkim was added under the jurisdiction of the Sikkim High Court.
· **(b) Dadra and Nagar Haveli, and Daman and Diu**: These were later under the jurisdiction of Bombay High Court.
· **(c) Union Territory Lakshadweep and Puducherry**: These areas are under the jurisdiction of different High Courts.

Q.42 **For the case of a curved mirror, the pole, centre of curvature and the principal focus are connected by the:**

A. lens axis
B. principal axis
C. radius of curvature
D. mirror axis

Answer: B

Sol: **The correct answer is (B) principal axis**

Explanation:

- In a curved mirror, the **pole (P)**, **centre of curvature (C)** and **principal focus (F)** all lie on a straight line.
- This straight line is called the **principal axis** of the mirror.
- It is the reference line for drawing ray diagrams of concave and convex mirrors.

Information Booster:

- Pole is the **midpoint** of the mirror's reflecting surface.
- Centre of curvature is the **centre of the sphere** of which the mirror is a part.
- Principal focus is the point where **parallel rays converge or appear to diverge**.
- Radius of curvature = distance between **C and P**.
- Principal axis is always **normal at the pole**.

Additional Knowledge:

- In concave mirrors, the focus is **in front** of the mirror.
- In convex mirrors, the focus is **behind** the mirror.
- The principal axis helps determine **image position and magnification**.

Q.43 **Which of the following statements about Ramadevara Betta in Ramanagara, Karnataka, is true?**

A. It is also known as Ramagiri and has historical significance dating back to the Vijayanagara Empire.
B. It is a recently discovered site with no historical or architectural significance.
C. It is primarily known for its Buddhist monasteries and Mughal-era forts.
D. It is a desert landscape with no vegetation or wildlife conservation efforts.

Answer: A

Sol: Ans. (a)

Ramadevara Betta, also called Ramagiri, is a historically significant hill in Ramanagara, Karnataka. It has a rich heritage linked to the Vijayanagara Empire and Kempegowda's rule. Due to its strategic high-altitude location, it was used as a military defense point in ancient times.

· Apart from its historical importance, Ramadevara Betta is home to ancient temples dedicated to Lord Rama and Lakshmana, featuring traditional South Indian architecture, intricate carvings, and stone sculptures.

Information Booster

· Ramadevara Betta is also called Ramagiri, known for its historical and religious significance.
· The hill was strategically important for military defense in the Vijayanagara and Kempegowda era.
· Temples dedicated to Lord Rama and Lakshmana are located on the hill.
· The site features South Indian temple architecture with detailed carvings.
· It is also part of the Ramadevara Betta Vulture Sanctuary, India's first vulture conservation site.

Additional Knowledge

· Buddhist Monasteries and Mughal Forts (Option c) – Ramadevara Betta has no connection to Buddhism or Mughal history.
· Desert Landscape (Option d) – The area is rocky with vegetation and is home to a vulture sanctuary.
· Recently Discovered Site (Option b) – The hill has been historically significant for centuries and is well-known in Karnataka's heritage.

Q.44 **Which statement about lyophilic sols is correct?**

A. They do not show the Tyndall effect.
B. They are easily coagulated by electrolytes.
C. They are unstable compared to lyophobic sols.
D. They have strong affinity for the dispersion medium.

Answer: D

Sol: **Correct Answer: (D) They have strong affinity for the dispersion medium.**

Explanation:

- Lyophilic sols strongly attract the dispersion medium, making them highly stable.
- Their particles are heavily solvated, preventing coagulation.
- They are reversible and easy to form.

Information Booster:

- Examples: starch sol, gum sol, gelatin sol.
- Lyophilic sols show Tyndall effect.
- Difficult to coagulate due to solvation.
- Highly stable compared to lyophobic sols.
- Used widely in food and pharmaceutical industries.

Additional Knowledge:

Lyophilic colloids:

These are also called reversible colloids because they can be easily converted back to their original state after coagulation.
They are formed by substances that have a strong affinity for the dispersion medium.

Lyophobic colloids:
Also known as irreversible colloids, they do not have a strong affinity for the dispersion medium.
They are less stable compared to lyophilic colloids and require stabilizing agents for their preparation.
Tyndall Effect:
It is the scattering of light by colloidal particles, making the path of the light visible.
Both lyophilic and lyophobic sols exhibit the Tyndall effect.
Coagulation:
It refers to the process of aggregation of colloidal particles to form larger particles, leading to precipitation.
Lyophilic sols are more resistant to coagulation due to their stability.
Applications of Lyophilic Colloids:
Used in food products like gelatin and starch-based foods.
Play a role in biological systems, such as protein-based colloids in cells.

Q.45 **A tank, filled partially with a liquid, is subjected to a uniform horizontal acceleration. Which of the following is true for the surface of liquid in the tank?**

A. The liquid surface falls down on the direction of motion and rises up on the back side of the tank
B. The liquid surface falls down only at the center of the tank
C. The surface of the liquid remains horizontal
D. The liquid surface rises up on the direction of motion and falls down on the back side of the tank

Answer: A

Sol: The correct answer is **(a) The liquid surface falls down on the direction of motion and rises up on the back side of the tank.**
Explanation:
• When the tank accelerates horizontally, the liquid, due to its inertia, tends to resist the change in motion.
• This resistance results in a pseudo-force acting on the liquid in the direction opposite to the acceleration.
• The combined effect of this horizontal pseudo-force and the constant downward pull of gravity causes the liquid surface to tilt.
• The surface becomes inclined, with the water level rising at the back (in the opposite direction of acceleration) and falling at the front (in the direction of acceleration).

Information Booster:
• The angle of inclination (theta) of the liquid surface with the horizontal is constant and can be calculated using the formula:
tan(theta) = a / g,
where 'a' is the horizontal acceleration and 'g' is the acceleration due to gravity.
• The liquid surface aligns itself perpendicular to the net effective acceleration vector, which is the vector sum of the acceleration due to gravity and the tank's horizontal acceleration.
• The pressure inside the liquid also varies in the horizontal direction. The pressure is highest at the back of the tank, where the fluid column is deepest, and lowest at the front.

Additional Knowledge:

The liquid surface falls down only at the center of the tank (Option b)
• This statement is incorrect. The liquid surface does not fall only at the center. The entire surface tilts linearly from front to back, with the maximum drop occurring at the front of the tank.

The surface of the liquid remains horizontal (Option c)
• This is incorrect. The liquid surface remains horizontal only when the tank is at rest or moving with a constant velocity (zero acceleration). Any horizontal acceleration will cause the surface to tilt.

The liquid surface rises up on the direction of motion and falls down on the back side of the tank (Option d)
• This is the reverse of the actual phenomenon. The liquid piles up at the back due to inertia and falls at the front where the motion is headed.

Q.46 **Neha is the mother of Vipul. Rajat is Neha's brother. Prabhakar is the father of Rajat. How is Prabhakar related to Vipul?**

A. Father's brother
B. Father's father
C. Mother's brother
D. Mother's father

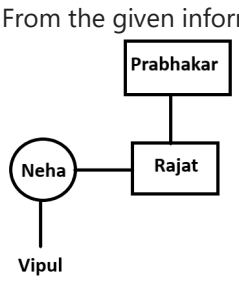
Answer: D

Sol: **Given:**
Neha is the mother of Vipul.
Rajat is Neha's brother.

Prabhakar is the father of Rajat.

Symbol in Diagram	Meaning
- / ○	Female
+ / □	Male
=	Married Couple
—	Siblings
|	Difference Of Generation

From the given information relationship diagram will be



Si, Prabhakar is **Mother's father** of Vipul.
Thus, the correct option is: (d)

Q.47 **Arun is the father of Chitra and Dinesh is the son of Bavana. Manish is Arun's brother. If Chitra is Dinesh's sister, how is Bavana related to Manish?**

A. Daughter

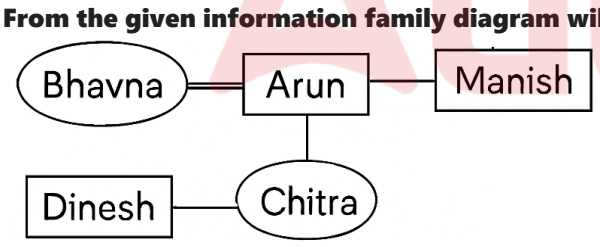
B. Sister
C. Mother-in-law
D. Sister-in-law

Answer: D

Sol: **Given:**
Arun is the father of Chitra and Dinesh is the son of Bavana.
Manish is Arun's brother.
If Chitra is Dinesh's sister,

Symbol in Diagram	Meaning
- / ○	Female
+ / □	Male
=	Married Couple
—	Siblings
|	Difference Of Generation

From the given information family diagram will be;



So, Bhavna is **sister-in-law** of Manish.
Thus, correct option is (d).

Q.48 **In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-pair in which the numbers are related in the same way as are the numbers of the following pairs.**
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)
16, 47
24, 71

A. 15, 62
B. 35, 104
C. 27, 101
D. 12, 45

Answer: B

Sol: **Given:**

16 → 47, 24 → 71

Logic: Second number = (First number × 3) − 1

16 → 47

16 × 3 − 1 = 48 − 1 = 47

24 → 71

24 × 3 − 1 = 72 − 1 = 71

Now check options:

Option (A) 15, 62

15 × 3 − 1 = 45 − 1 = 44 ≠ 62

Option (B) 35, 104 → **Pattern Follow**

35 × 3 − 1 = 105 − 1 = 104

Option (C) 27, 101

27 × 3 − 1 = 81 − 1 = 80 ≠ 101

Option (D) 12, 45

12 × 3 − 1 = 36 − 1 = 35 ≠ 45

Thus, the correct option is **(B) 35, 104.**

Q.49 **Select the option that is related to the sixth number in the same way as the first number is related to the second number and the third number is related to the fourth number.**

144 : 225 :: 169 : 256 :: ? : 361

A. 324
B. 256
C. 196
D. 144

Answer: B

Sol: **Given** - 144 : 225 :: 169 : 256 :: ? : 361

Logic -

1st Pair:

144 → 12^2

12 + 3 = 15

225 → 15^2

2nd Pair:

169 → 13^2

13 + 3 = 16

256 → 16^2

3rd Pair:

361 → 19^2

19 - 3 = 16

256 → 16^2

hence 256 is correct

Q.50 **'Brave' is related to 'Courageous' in the same way as 'Calm' is related to '_____'. (The words must be considered as meaningful English words and must NOT be related to each other based on the number of letters/number of consonants/vowels in the word)**

A. Excite
B. Stormy
C. Upset
D. Quiet

Answer: D

Sol: "Brave" is related to "Courageous" as both are **synonyms.**

Similarly,

"Calm" is related to a synonym which is **"Quiet".**

The other options (Excite, Stormy, Upset) are not synonyms of Calm.

So, the pair is: **Brave : Courageous :: Calm : Quiet.**

Thus, the correct option is: (d)

Q.51 Flour is related to Bread in the same way as Clay is related to:

A. Pot
B. Wet
C. Round
D. Brown

Answer: A

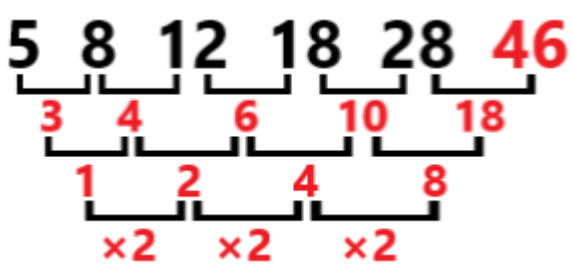
Sol: **Given**:
Flour is related to **Bread**.
Similarly,
Clay is the raw material used to make a **pot**.
Thus, correct option is (a).

Q.52 Which of the following numbers will replace the question mark (?) in the given series?
5, 8, 12, 18, 28, ?

A. 48
B. 46
C. 52
D. 50

Answer: B

Sol: **Given**: 5, 8, 12, 18, 28, ?



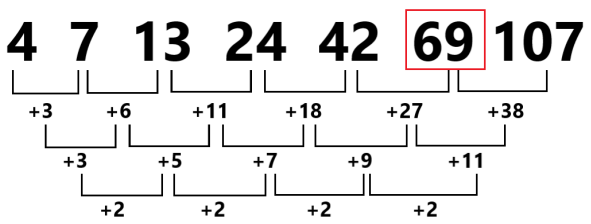
So, the missing term is **46**.
Thus, correct option is (b).

Q.53 What should come in place of the question mark (?) in the given series?
4, 7, 13, 24, 42, ? , 107

A. 68
B. 66
C. 69
D. 67

Answer: C

Sol: **Given:**
4, 7, 13, 24, 42, ? , 107
Let's check the series:



So, the missing number is: **69**
Thus, the correct option is: (c)

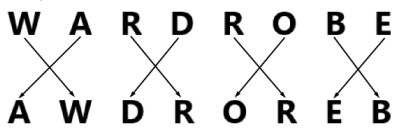
Q.54 In a certain code language, WARDROBE is written as AWDROREB. How will ORIENTAL be written in the same code language?

A. ROETINAL
B. EORITNLA

C. ROEITNLA
D. ROEITNAL

Answer: C

Sol: **Given**: In a certain code language, WARDROBE is written as AWDROREB.
Logic: Position of letters are interchanged.
For, WARDROBE - AWDROREB



Similarly,
ORIENTAL - ?

So, ORIENTAL is written as **ROEITNLA**.
Thus, correct option is (c).

Q.55 **In a code language, 'HEAD' is coded as JHCG, and 'NOSE' is coded as PRUH. How will 'HAND' be coded in the same language?**

A. JDQG
B. KCQF
C. JDPG
D. KDQG

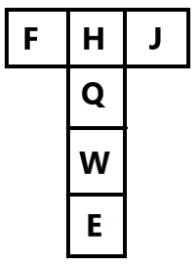
Answer: C

Sol: **Given:**
HEAD is coded as JHCG
NOSE is coded as PRUH

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: Alternate + 2 and +3.
HEAD → JHCG
H + 2 → J
E + 3 → H
A + 2 → C
D + 3 → G
NOSE → PRUH
N+ 2 → P
O+ 3 → R
S + 2 → U
E+ 3 → H
Now, applying this logic to HAND:
H + 2 → J
A + 3 → D
N + 2 → P
D + 3 → G
So, HAND will be coded as **JDPG**.
Thus, correct option is (c).

Q.56 **A cube is made by folding the given sheet. In the cube so formed, which letter will be on the opposite face to the face having the letter 'F'?**

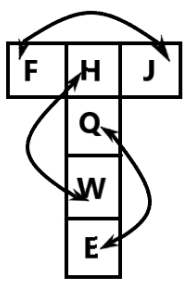


A. W

B. E
C. Q
D. J

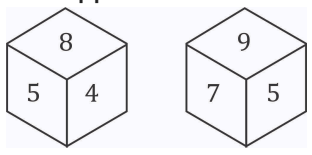
Answer: D

Sol:



So, opposite of **F** is **J**
Thus, the correct option is: **(d)**

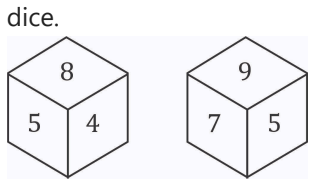
Q.57 **Six numbers 4, 5, 6, 7, 8 and 9 are written on different faces of a dice. Two positions of this dice are shown in the figure. Find the number on the face opposite to 7.**



A. 6
B. 8
C. 4
D. 5

Answer: B

Sol: **Logic**: If two dice have the same face value in the given image then their clockwise or anticlockwise wise number are known as opposite numbers in dice.



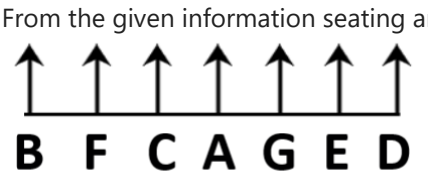
5 → **8** → 4
5 → 7 → 9
So, the opposite of 7 is **8**.
Thus, correct option is (b).

Q.58 **Seven friends - A, B, C, D, E, F and G - are seated in a row, facing north. Exactly three people are seated to the left of A. F is seated second to the left of A. E is an immediate neighbour of G and D. F is fourth to the left of E. Neither G nor C is seated at the extreme ends. If B is not a neighbour of A, where is C seated?**

A. Immediate right of A
B. Third to the right of B
C. Second to the left of G
D. Second to the left of E

Answer: C

Sol: **Given:**
Seven friends - A, B, C, D, E, F and G - are seated in a row, facing north.
Exactly three people are seated to the left of A.
F is seated second to the left of A.
E is an immediate neighbour of G and D.
F is fourth to the left of E.
Neither G nor C is seated at the extreme ends.
B is not a neighbour of A.
From the given information seating arrangement will be:



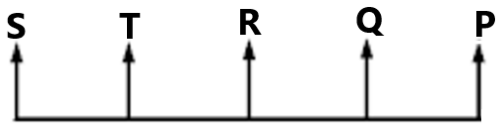
So, C seated Second to the left of G.
Thus, the correct option is: (c)

Q.59 **There are five friends - P, Q, R, S and T sitting in a row facing North. R is sitting exactly in the middle of the row. T is sitting to the immediate right and immediate left of S and R, respectively. Q is not sitting at the extreme end, Who is sitting second to the left of P?**

A. T
B. R
C. S
D. Q

Answer: B

Sol: **Given**:
There are five friends - P, Q, R, S and T sitting in a row facing North.
R is sitting exactly in the middle of the row.
T is sitting to the immediate right and immediate left of S and R, respectively.
Q is not sitting at the extreme end.
From the given information seating arrangement will be.



R is sitting second to the left of P.
Thus, correct option is (b).

Q.60 **In this question, three statements are given, followed by two conclusions numbered I and II. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusion(s) logically follow(s) from the statements.**
Statements:
1. Some flowers are pink.
2. All pink things are beautiful.
3. Some beautiful things are costly.
Conclusions:
I. All flowers are beautiful.
II. Some pink things are costly.

A. Neither conclusion I nor II follows.
B. Both conclusions I and II follow.
C. Only conclusion I follows.
D. Only conclusion II follows.

Answer: A

Sol: **Statements**:
1. Some flowers are pink.
2. All pink things are beautiful.
3. Some beautiful things are costly.
From the given statements possible Venn diagram will be.

Conclusions:
I. All flowers are beautiful. (**False**, some flowers are pink and all pink things are beautiful, so that means all flowers are not beautiful).
II. Some pink things are costly. (**False**, there is no relation between pink things and costly).
So, **Neither conclusion I nor II follows.**
Thus, correct option is (a).

Q.61 **Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusion(s) logically follow(s) from the statements.**
Statements:
All trans are cows.
No cow is a bun.
Conclusions:

(I): No tram is a bun.

(II): Some buns are cows.

A. Both conclusions (I) and (II) follow.
B. Only conclusion (II) follows.
C. Neither conclusion (I) nor (II) follows.
D. Only conclusion (I) follows.

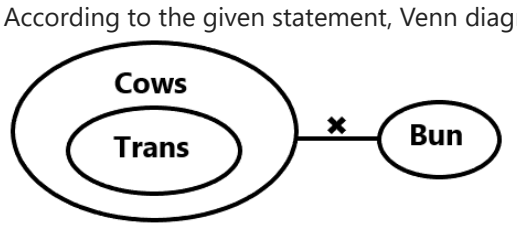
Answer: D

Sol: **Statements:**

All trans are cows.

No cow is a bun.

According to the given statement, Venn diagram will be:



Let's analyze the conclusions:

Conclusions:

(I): No tram is a bun. → **True**

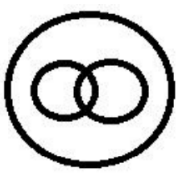
Follows, because all trams are cows and no cow is a bun, so no tram can be a bun.

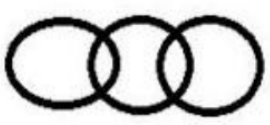
(II): Some buns are cows. → **False**

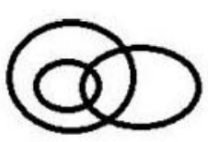
Does not follow, because it directly contradicts "No cow is a bun".

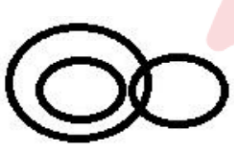
Thus, the correct option is **(D) Only conclusion (I) follows.**

Q.62 **Select the Venn diagram that best illustrates the relationship between the following classes.**
Men, Pharmacists, Brothers

A. 

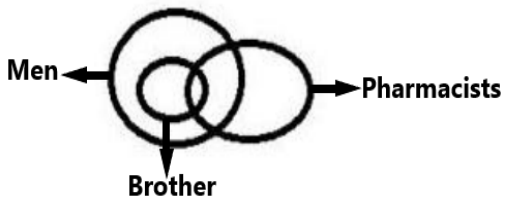
B. 

C. 

D. 

Answer: C

Sol: **Given**: Men, Pharmacists, Brothers

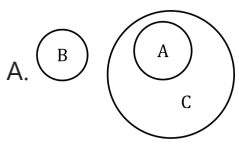


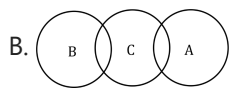
All **brothers** are **men** but **pharmacists** may be men or women.

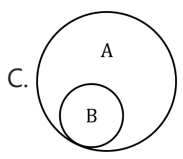
And some **men** and **brothers** are pharmacists.

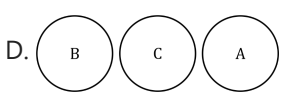
Thus, correct option is (c).

Q.63 **Which of the following Venn diagrams correctly depicts the relationship between the following classes?**
A. Biscuit B. Rice Pakoras C. Baking

A. 

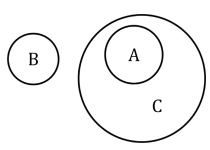
B. 

C. 

D. 

Answer: A

Sol: **Given**: A. Biscuit B. Rice Pakoras C. Baking



All **biscuits** are **baked** and **Rice pakoras** are different.
Thus, correct option is (a).

Q.64 **If the time in the mirror image of a 12 – hour clock is 3 : 55, what is the actual time?**

A. 8 : 05
B. 8 : 25
C. 7 : 05
D. 7 : 25

Answer: A

Sol: Formula for Mirror Time in a 12-Hour Clock:
Actual Time=12:00−Mirror Time
Plug in the Mirror Time: Mirror time = 3:55
Actual Time=12:00−3:55
Perform Subtraction:
Subtract minutes: 60−55 = 05 minutes.
Subtract hours: 12−3−1=8 hours (adjusting for the minute borrow).
The actual time is **8:05**

Q.65 **If 1 August 2021 was Sunday, then what was the day on 1 November 2021?**

A. Sunday
B. Monday
C. Tuesday
D. Friday

Answer: B

Sol: **Given**: If 1 August 2021 was Sunday.
Solution:
August → September 1 = 31 days
September → October 1 = 30 days
October → November 1 = 31 days
31 + 30 + 31 = 92 days
92 ÷ 7 = 13 weeks + 1 day
The weekday shifts by +1 day.
1 August 2021 = Sunday + 1 day → **Monday**
So, **Monday** was the day on 1 November 2021.
Thus, correct option is (b).

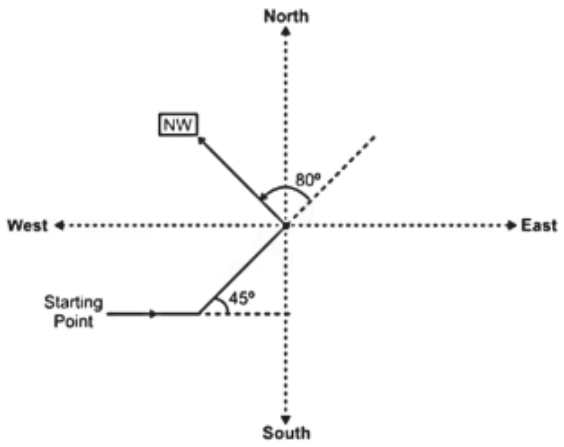
Q.66 **Meet starts cycling early in the morning, facing the Sun. After some time, he takes a 45° turn to his left and then again turns 80° towards his left. In which direction is he now with respect to his initial position?**

A. South-East

B. South-West
C. North-West
D. North-East

Answer: C

Sol: **Given**:
Meet starts cycling early in the morning, facing the Sun.
After some time, he takes a 45° turn to his left and then again turns 80° towards his left.
From the given information path diagram will be.



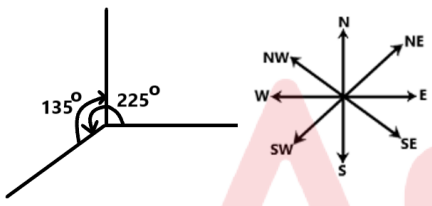
In **North-West** direction is he now with respect to his initial position.
Thus, correct option is (c).

Q.67 **A girl is facing East. She turns 225° in the anticlockwise direction and then 135° in the clockwise direction. Which direction is she facing now ?**

A. North-West
B. North-East
C. West
D. North

Answer: D

Sol: **Given**:
A girl is facing East. She turns 225° in the anticlockwise direction and then 135° in the clockwise direction.



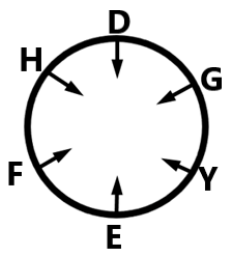
She is facing now in **North** direction.
Thus, correct option is (d).

Q.68 **Six people, D, E, F, G, H and Y, are sitting around a circular table, facing the centre. F sits third to the left of G. Only one person sits between F and Y when counted from the right of F. Only two people sit between Y and H. D is an immediate neighbour of H. How many people sit between D and E when counted from right of E?**

A. Two
B. One
C. Zero
D. Three

Answer: A

Sol: **Given:**
Six people, D, E, F, G, H and Y, are sitting around a circular table, facing the centre.
F sits third to the left of G.
Only one person sits between F and Y when counted from the right of F.
Only two people sit between Y and H.
D is an immediate neighbour of H.
From the given information seating arrangement will be;



Two people are between D and E when counted from right of E.
Thus, correct option is (a).

Q.69 **Which letter-cluster will replace the question mark (?) to complete the given series?**
OSRE, PVMC, QYHA, RBCY, ?

A. SFYW
B. SEXW
C. SFXW
D. SEYW

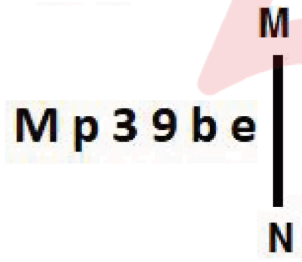
Answer: B

Sol: **Given**: OSRE, PVMC, QYHA, RBCY, ?

1	2	3	4	5	6	7	8	9	10	11	12	13
A	B	C	D	E	F	G	H	I	J	K	L	M
Z	Y	X	W	V	U	T	S	R	Q	P	O	N
26	25	24	23	22	21	20	19	18	17	16	15	14

Logic: 1st letter + 1, 2nd letter + 3, 3rd letter - 5 and 4th letter - 2 place.
For, 1st letter
O + 1 = P, P + 1 = Q, Q + 1 = R, R + 1 = S
For, 2nd letter
S + 3 = V, V + 3 = Y, Y + 3 = B, B + 3 = E
For, 3rd letter
R - 5 = M, M - 5 = H, H - 5 = C, C - 5 = X
For, 4th letter
E - 2 = C, C - 2 = A, A - 2 = Y, Y - 2 = W
So, the missing term is **SEXW**.
Thus, correct option is (b).

Q.70 **Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.**



A. ɘdɐƐqM

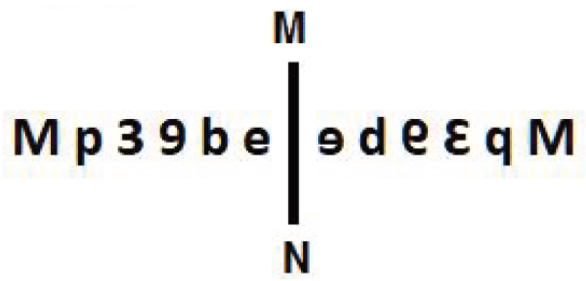
B. ɘdϬƐqW

C. ɘqɐƐdM

D. edɐ3pM

Answer: A

Sol: The mirror image of the given letter/ number as shown below.



Letters	Mirror Images	Letters	Mirror Images	Letters	Mirror Images	Letters	Mirror Images
a	ɐ	h	ɥ	o	o	v	ʌ
b	d	i	ᴉ	p	q	w	ʍ
c	ɔ	j	ɾ	q	p	x	x
d	b	k	ʞ	r	ɹ	y	ʎ
e	ə	l	l	s	s	z	z
f	ɟ	m	ɯ	t	ʇ		
g	ƃ	n	u	u	n		

Letters	Mirror Images	Letters	Mirror Images	Letters	Mirror Images	Letters	Mirror Images
A	A	H	H	O	O	V	V
B	ᗺ	I	I	P	Ԛ	W	W
C	Ɔ	J	ſ	Q	Ό	X	X
D	ᗡ	K	ʞ	R	Я	Y	Y
E	Ǝ	L	⅃	S	S	Z	Z
F	ᖵ	M	W	T	T		
G	⅁	N	И	U	U		

Numbers	Mirror Images	Numbers	Mirror Images	Numbers	Mirror Images
1	ɪ	4	↊	7	٧
2	ᘔ	5	ƽ	8	8
3	Ɛ	6	ə	9	ๆ

Thus, correct option is (a).

Q.71 Two trains of length 115 m and 132 m respectively are moving towards each other. Their speeds are 11 m/s and 8 m/s. How much time will the trains take to cross each other?

A. 17 seconds
B. 11 seconds
C. 15 seconds
D. 13 seconds

Answer: D

Sol: **Given:**

Length of Train 1 = 115 m

Length of Train 2 = 132 m

Speed of Train 1 = 11 m/s

Speed of Train 2 = 8 m/s

Formula Used:

Time = $\frac{\text{Length}_1 + \text{Length}_2}{\text{Speed}_1 + \text{Speed}_2}$

Solution:

Time = $\frac{115 + 132}{11 + 8} = \frac{247}{19} = 13 \text{ seconds}$

Q.72 The point (9, 0), (9, 6), (-9, 6) and (-9, 0) are the vertices of a _____.

A. square
B. rectangle
C. trepezium
D. rhombus

Answer: B

Sol: **Given:**

The vertices of the quadrilateral are: A(9, 0), B(9, 6), C(-9, 6), D(-9, 0)

Solution:

We need to determine the type of quadrilateral formed by these points.

First, we calculate the distances between consecutive points using the distance formula:

$AB = \sqrt{((9-9)^2 + (6-0)^2)} = 6$
$BC = \sqrt{((-9-9)^2 + (6-6)^2)} = 18$
$CD = \sqrt{((-9-(-9))^2 + (0-6)^2)} = 6$
$DA = \sqrt{((9-(-9))^2 + (0-0)^2)} = 18$

Since AB = CD and BC = DA, the quadrilateral is a rectangle.

Q.73 **A shopkeeper offers the following three schemes. Which scheme has the maximum discount percent?**
I. Two successive discounts of 15% and 20%.
II. Buy 4 get 2 free.
III. Buy 6 get 4 free

A. III only
B. I only
C. Both I and II
D. II only

Answer: A

Sol: **Given:**
Three discount schemes:

I. Two successive discounts of 15% and 20%.

II. Buy 4 get 2 free.

III. Buy 6 get 4 free.

Find: Which scheme gives the maximum discount percent.

Solution:

Scheme I: Two successive discounts 15% and 20%

Net Price Factor = 0.85 × 0.80 = 0.68

Net Discount = 1 - 0.68 = 0.32 = 32%

Scheme II: Buy 4 get 2 free

Items received = 4 + 2 = 6

Pay for = 4

Effective price per item = $\frac{4}{6} = \frac{2}{3}$

Discount = 1 - $\frac{2}{3} = \frac{1}{3} = 33.\overline{3}\%$

Scheme III: Buy 6 get 4 free

Items received = 6 + 4 = 10

Pay for = 6

Effective price per item = $\frac{6}{10}$ = 0.6

Discount = 1 - 0.6 = 0.4 = 40%

Comparison:

Scheme I → 32%

Scheme II → 33.33%

Scheme III → 40%

Therefore, Scheme III (Buy 6 get 4 free) offers the maximum discount percent.

Q.74 **If 39% of first number is equal to eight-ninths of second number, what is the ratio of first number to the second number?**

A. 805 : 353
B. 804 : 348
C. 796 : 347
D. 800 : 351

Answer: D

Sol: **Given:**

39% of first number (A) = \frac{8}{9} of second number (B)

Solution:

$$\frac{39}{100}A = \frac{8}{9}B$$

(39 × 9)A = (8 × 100) B

351A = 800B

$$\frac{A}{B} = \frac{800}{351}$$

So, the ratio of first number to second number:

A : B = 800 : 351

Q.75 **The simple and compound interest that can be earned in two years at the same rate on a certain sum is Rs. 1,000 and Rs. 1,040 respectively. What is the rate (percent per annum) of interest?**

A. 11
B. 8
C. 10
D. 9

Answer: B

Sol: **Given:**

Simple Interest (SI) for 2 years = ₹1000

Compound Interest (CI) for 2 years = ₹1040

Same principal P and same annual rate r%

Formula Used:

$$\mathrm{SI}_{2\ \mathrm{yr}} = \frac{P \times r \times 2}{100}$$

$$\text{CI}_{2\text{ yr}} = P\left(1+\frac{r}{100}\right)^2 - P = \frac{2Pr}{100} + \frac{Pr^2}{10000}$$

Difference (CI − SI for 2 years): $\text{Diff} = \frac{Pr^2}{10000}$

Solution:

From SI: $\frac{2Pr}{100} = 1000$

Pr = 50,000.

From CI − SI: $\frac{Pr^2}{10000} = 1040 - 1000 = 40 \implies Pr^2 = 400{,}000.$

$$\frac{Pr^2}{Pr} = \frac{400{,}000}{50{,}000}$$

r = 8% per annum

Alternate Method :

For 2 years at the same rate,

$\text{Diff} = \text{CI} - \text{SI} = \frac{Pr^2}{10000},$

$\text{SI} = \frac{2Pr}{100}.$

Thus,

$\frac{\text{Diff}}{\text{SI}} = \frac{r}{200} \implies r = 200 \times \frac{\text{Diff}}{\text{SI}} = 200 \times \frac{40}{1000} = 8\%.$

Q.76 If sin A=$\frac{1}{2}$, then the value of cot A is

A. √3
B. $\frac{1}{\sqrt{3}}$
C. $\frac{\sqrt{3}}{2}$
D. 1

Answer: A

Sol: **Given:** sin A=$\frac{1}{2}$

Solution:

$\sin A = \frac{1}{2}$

$A = \frac{1}{2}$

$\text{Hence } A = 30^\circ$

Therefore,

$\cot A = \cot 30^\circ$

$= \sqrt{3}$

So, cot A is $\sqrt{3}$

Thus, the correct answer is (a).

Q.77 When difference between compound and simple interest for three years is Rs. 122 at 5% interest per annum, the principal is Rs. _____

A. 16000

B. 15425
C. 16420
D. 17200

Answer: A

Sol: **Given:**

Difference between Compound Interest (CI) and Simple Interest (SI) for 3 years = Rs. 122

Rate (R) = 5% per annum

Time (T) = 3 years

Formula Used:

CI - SI (for 3 year) = $\frac{P \times R^2 \times (300 + R)}{100^3}$

Where:

P = Principal, R = Rate %, Time = 3 years

Solution:

Substitute values:

$$122 = \frac{P \times 5^2 \times (300 + 5)}{100^3}$$

$$122 = \frac{P \times 25 \times 305}{1000000}$$

$$122 = \frac{P \times 7625}{1000000}$$

$$P = \frac{122 \times 1000000}{7625}$$

$$P = \frac{122000000}{7625} = 16000$$

Thus, Principle is Rs. 16,000

Q.78 **The straight line kx – 3y = 6 passes through the point (3, 2). What is the value of k?**

A. 3
B. 4
C. 6
D. 2

Answer: B

Sol: **Given:**

The equation of the straight line: kx - 3y = 6.

The point (3, 2) lies on the line.

Solution:

Substitute x = 3 and y = 2 into the equation:

k(3) - 3(2) = 6

3k - 6 = 6

3k = 12

k = 4

Q.79 **The income of A is 25% less than the income of B whose income is 40% more than that of C. The income of C is 20% less than that of D. By what percent is the income of A more than the income of C?**

A. 5%
B. 10%
C. 4%
D. 8%

Answer: A

Sol: **Given:**

The income of A is 25% less than the income of B.

The income of B is 40% more than that of C.

The income of C is 20% less than that of D.

Solution:

The relationship between the income of A and B: A = B - 0.25B = 0.75B

The relationship between the income of B and C: B = C + 0.40C = 1.40C

The relationship between the income of C and D: C = D - 0.20D = 0.80D

From the second relationship, B = 1.40C

Substitute this into the first relationship, A = 0.75B:

A = 0.75×1.40C = 1.05C

The income of A is 1.05C, and the income of C is C.

Percentage increase $= \frac{A - C}{C} \times 100 = \frac{1.05C - C}{C} \times 100 = \frac{0.05C}{C} \times 100 = 5\%$

The income of A is 5% more than the income of C.

Q.80 **Perimeter of a rectangle is six times of its breadth. If breadth of the rectangle is 15 cm, then what is the area of this rectangle?**

A. 450 cm^2
B. 300 cm^2
C. 900 cm^2
D. 600 cm^2

Answer: A

Sol: **Given:**

Perimeter of the rectangle is six times its breadth.

Breadth of the rectangle = 15 cm.

Formula Used:

Perimeter of a rectangle = 2 × (Length + Breadth)

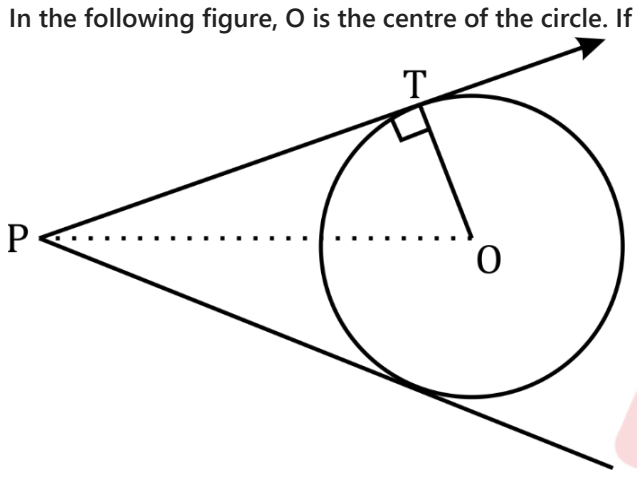
Area of a rectangle = Length × Breadth

Solution:
Let the length of the rectangle be L .
The perimeter is given as six times the breadth:
$2 \times (L + 15) = 6 \times 15$
2×(L + 15) = 90
L + 15 = 45
L = 45 - 15 = 30 cm

$$\text{Area} = L \times \text{Breadth} = 30 \times 15 = 450\text{cm}^2$$

The area of the rectangle is 450 cm^2.

Q.81 In the following figure, O is the centre of the circle. If OP = 5 cm and radius of the circle is 3 cm, find the length of the tangent PT.



A. 6 cm
B. 4 cm
C. 3 cm
D. 5 cm

Answer: B

Sol: **Given:**

OP = 5 cm

Radius(OT) = 3 cm

Concept Used:

A tangent drawn on a circle is perpendicular to the radius of a circle.

Solution:

By Pythagoras theorem:

$(OP)^2 = (PT)^2 + (OT)^2$

$(5)^2 = (PT)^2 + (3)^3$

$(PT)^2 = 25 - 9 = 16$

PT = 4 cm

Q.82 **Brajesh had Rs.8,600 which he invested in two parts. Simple interest received on the first part at 15% p.a. in 4 years is equal to the simple interest received on the second part at 20% p.a. in 3 years. Find the difference in the two parts.**

A. Rs.210
B. Rs.0
C. Rs.190
D. Rs.290

Answer: B

Sol: **Given:**

Total money = ₹8,600

Simple interest on first part at 15% for 4 years equals simple interest on second part at 20% for 3 years.

Formula Used:

SI = $\frac{P \times R \times T}{100}$

Solution:

Let the two parts be:

First part = x

Second part = (8600 - x)

SI on first part:

$$SI_1 = \frac{x \times 15 \times 4}{100} = \frac{60x}{100} = 0.6x$$

SI on second part:

$$SI_2 = \frac{(8600 - x) \times 20 \times 3}{100}$$

$$= \frac{60(8600 - x)}{100} = 0.6(8600 - x)$$

Given that $SI_1 = SI_2$

0.6x = 0.6(8600 - x)

x = 8600 - x

2x = 8600

x = 4300

So,

First part = ₹4300

Second part = ₹4300

Difference between the two parts:

4300 - 4300 = 0

₹0 (Both parts are equal)

Q.83 Find the area of an equilateral triangle having each side 12 cm long.

A. $32\sqrt{3}\,\text{cm}^2$

B. $36\sqrt{3}\,\text{cm}^2$

C. $28\sqrt{3}\,\text{cm}^2$

D. $24\sqrt{3}\,\text{cm}^2$

Answer: B

Sol: **Given:**

Side of equilateral triangle a = 12 cm

Formula Used:

$$\text{Area} = \frac{\sqrt{3}}{4}a^2$$

Solution:

$$\text{Area} = \frac{\sqrt{3}}{4} \times 12^2$$

$$= \frac{\sqrt{3}}{4} \times 144$$

$$= 36\sqrt{3}$$

Q.84 The maximum volume (in cm^3) of a right circular cone that can be cut out from a cube of edge 4.2 cm is:

A. 9.7
B. 77.6
C. 58.2
D. 19.4

Answer: D

Sol: **Given:**

Edge of cube = 4.2 cm

So,

Radius of cone = 4.2 / 2 = 2.1 cm

Height of cone = 4.2 cm

Formula used:

Volume of cone $= \frac{1}{3}\pi r^2 h$

Solution:

Volume = $\frac{1}{3} \times \frac{22}{7} \times (2.1)^2 \times 4.2$

$= \frac{1}{3} \times \frac{22}{7} \times 4.41 \times 4.2$

$= \frac{1}{3} \times \frac{22}{7} \times 18.522$

$= \frac{1}{3} \times 58.212 \approx 19.4\,\text{cm}^3$

Correct answer is (D)

Q.85 **Lokesh and Manoj can complete a certain piece of work in 11 and 15 days, respectively. They started to work together, and after 5 days, Manoj left. In how many days will Lokesh complete the remaining work?**

A. $2\frac{1}{3}$
B. $2\frac{2}{3}$
C. $7\frac{2}{3}$
D. $7\frac{1}{3}$

Answer: A

Sol: **Given:**

Lokesh can complete the work in 11 days

Manoj can complete the same work in 15 days

They work together for 5 days, then Manoj leaves

Formula Used:

Work done = Rate × Time; Remaining work = Total work − Work done.

Solution:

Total work = LCM(11, 15) = 165 units

Lokesh's rate = $\frac{165}{11}$ = 15 units/day

Manoj's rate = $\frac{165}{15}$ = 11 units/day

Combined rate when working together:

= 15 + 11 = 26 units/day

Work done in 5 days together:

= 26 × 5 = 130 units

Remaining work = 165 - 130 = 35 units

Time taken by Lokesh alone to finish 35 units:

$= \frac{35}{15} = \frac{7}{3} = 2\frac{1}{3}$ days

Q.86 **The cost of 12 pens and 7 pencils is ₹285. If the cost of a pen decreases by ₹6 and the cost of a pencil increases by ₹5, then the cost of 11 pens and 3 pencils is ₹118. What is the original cost of 2 pens and 2 pencils?**

A. ₹68
B. ₹66
C. ₹73
D. ₹70

Answer: D

Sol: **Given:**

Cost of 12 pens and 7 pencils = ₹285

If pen price decreases by ₹6 and pencil price increases by ₹5, then cost of 11 pens and 3 pencils = ₹118

Find original cost of 2 pens and 2 pencils

Solution:

Let the original cost of:

1 pen = P and 1 pencil = Q

Now,

12P + 7Q = 285.....(1)

New prices: pen = (P - 6), pencil = (Q + 5)

11(P - 6) + 3(Q + 5) = 118

11P - 66 + 3Q + 15 = 118

11P + 3Q - 51 = 118

11P + 3Q = 169 .....(2)

Subtracting equations 7 × (2) - 3×(1)

77P - 36P = 1183 - 855

41P = 328

P = 8

Substitute in (2):

11(8) + 3Q = 169

88 + 3Q = 169

3Q = 81

Q = 27

Original cost of 2 pens and 2 pencils:

2P + 2Q = 2(8) + 2(27) = 16 + 54 = ₹70

Q.87 **S drives his car and covers 37 km and 500 m in 90 minutes. What is his average speed (in km/h)?**

A. 25
B. 20
C. 40
D. 22.5

Answer: A

Sol: **Given:**

S drives his car and covers a distance of 37 km and 500 m in 90 minutes.

We need to calculate his average speed in km/h.

Formula Used:

Average Speed = $\frac{\text{Total Distance}}{\text{Total Time}}$

Solution:

The total distance is 37 km and 500 m. Since 500 m = 0.5 km, the total distance is:

37 km + 0.5 km = 37.5 km

Average Speed = $\frac{37.5\,\text{km}}{\frac{90}{60}\,\text{hours}} = 25\,\text{km/h}$

Thus, the average speed of S is 25 km/h.

Q.88 Simplify : $\sec^2\beta - \frac{1}{\text{cosec}^2\beta - 1}$

A. 0
B. secβ
C. 1
D. cosecβ

Answer: C

Sol: **Given:**

$\sec^2\beta - \frac{1}{\text{cosec}^2\beta - 1}$

Solution:

$\sec^2\beta - \frac{1}{\text{cosec}^2\beta - 1}$

$= \sec^2\beta - \frac{1}{\frac{1}{\sin^2\beta} - 1}$

$= \sec^2\beta - \frac{\sin^2\beta}{1 - \sin^2\beta}$

$= \sec^2\beta - \frac{\sin^2\beta}{\cos^2\beta}$

$= \sec^2\beta - \tan^2\beta$

$= 1$

Q.89 **Anjani can do a certain piece of work in 30 days. Anjani and Khusbhu can together do the same work in 16 days, and Anjani, Khushbu and Sushmita can do the same work together in 15 days. IN how many days can Ajani and Sushmita do the same work?**

A. 85/4
B. 80/3
C. 73/5
D. 81/3

Answer: B

Sol: **Given:**

Anjani alone = 30 days

Anjani + Khushbu = 16 days

Anjani + Khushbu + Sushmita = 15 days

Find: Time taken by Anjani + Sushmita

Formula Used:

Work rate = $\frac{1}{\text{time}}$

Solution:

Let total work = 1 unit

Anjani's rate: A = $\frac{1}{30}$

Anjani + Khushbu: A + K = $\frac{1}{16}$

Khushbu = (A + K) − A

= $\frac{1}{16} - \frac{1}{30} = \frac{7}{240}$

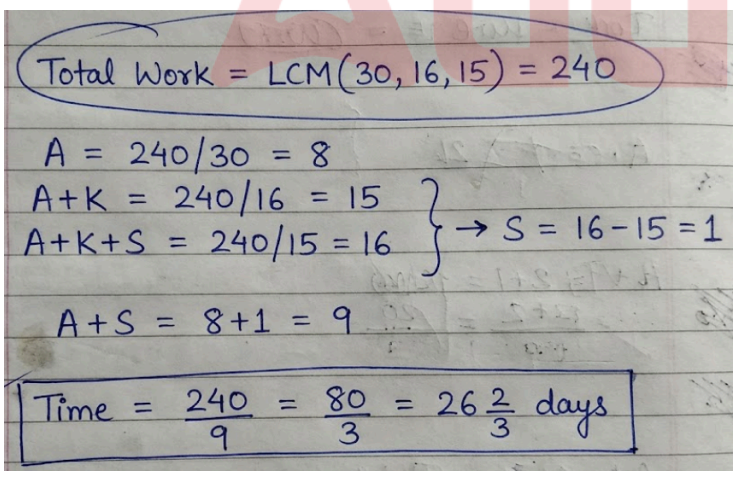
Sushmita = (A+K+S) − (A+K)

= $\frac{1}{15} - \frac{1}{16} = \frac{1}{240}$

A + S = $\frac{1}{30} + \frac{1}{240} = \frac{9}{240}$

Time = $\frac{240}{9} = \frac{80}{3} = 26\frac{2}{3}\ \text{days}$

Alternate Solution:



Q.90 **400 apples were bought at Rs. 1220 per hundred and were sold at a profit of Rs. 920. Find the selling price (in Rs.) per dozen of apples.**

A. 184
B. 164
C. 174
D. 189

Answer: C

Sol: **Given:**

400 apples bought at Rs 1220 per hundred

Total profit = Rs 920

Solution:

Cost price for 400 apples = $\frac{1220}{100}$ × 400 = Rs. 4880

Total selling price = 4880 + 920 = Rs. 5800

Selling price per apple = $\frac{5800}{400}$ = Rs 14.5

Selling price per dozen = 14.5 × 12 = Rs 174

Q.91 **The sum of the squares of two consecutive even natural numbers is 1924. The sum of the numbers is**

A. 54
B. 68
C. 62
D. 60

Answer: C

Sol: **Given:**
The sum of the squares of two consecutive even natural numbers is 1924.

Solution:

Let the numbers be: x and x+2

Now,

$x^2 + (x+2)^2 = 1924$

$x^2 + x^2 + 4x + 4 = 1924$

$2x^2 + 4x + 4 = 1924$

$2x^2 + 4x - 1920 = 0$

$x^2 + 2x - 960 = 0$

(x + 32)(x - 30) = 0

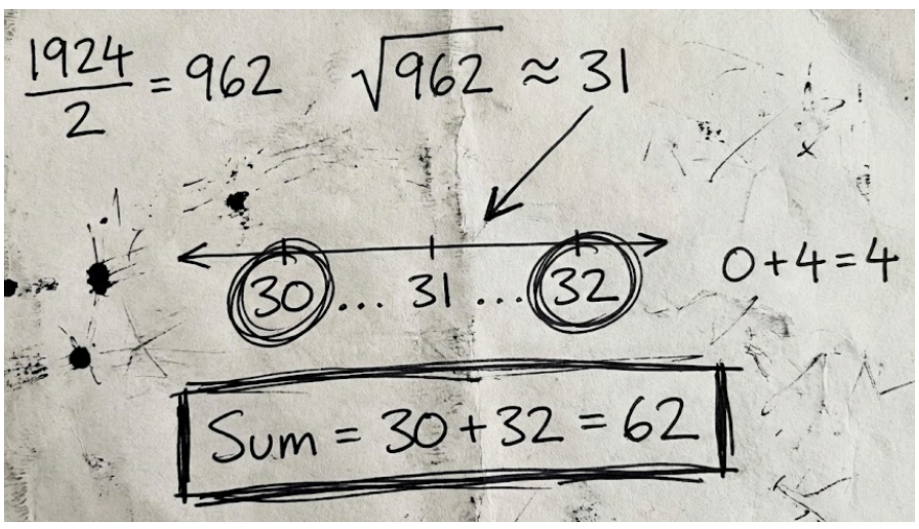
Thus,

x = 30 (valid even natural number)

Next number: x + 2 = 32

Sum = 30 + 32 = 62

Alternate Solution:



Q.92 The arithmetic mean of the observations 69, 60, 39, 58, 55, 31, 84, 64 and 80 is:

A. 59
B. 53
C. 50
D. 60

Answer: D

Sol: **Given:**

Observations: 69, 60, 39, 58, 55, 31, 84, 64, 80

Formula Used:

$$\text{Arithmetic Mean} = \frac{\text{Sum of observations}}{\text{Number of observations}}$$

Solution:

Sum = 69 + 60 + 39 + 58 + 55 + 31 + 84 + 64 + 80 = 540

Count = 9

Mean = $\frac{540}{9} = 60$

Q.93 The percentage profit earned by selling an article for ₹1,960 is equal to the percentage loss incurred by selling the same article for ₹1,640. At what price should the article be sold to make a 20% profit?

A. ₹1,800
B. ₹2,160
C. ₹3,600
D. ₹1,820

Answer: B

Sol: **Given :**

Selling price (SP) at profit = ₹1960

Selling price at loss = ₹1640

Profit% = Loss%

Need SP for 20% profit.

Formula Used :

Profit% = $\frac{SP - CP}{CP} \times 100$

Loss% = $\frac{CP - SP}{CP} \times 100$

Where, CP = Cost Price

Solution:

Since profit% = loss%:

$$\frac{1960 - CP}{CP} = \frac{CP - 1640}{CP}$$

1960 - CP = CP - 1640

1960 + 1640 = 2CP

3600 = 2CP

CP = 1800

Required SP for 20% profit:

SP = CP $\times 1.20 = 1800 \times 1.20$ = 2160

Q.94 **Three smaller cubes with sides of 3, 4, and 5 cm are melted together to form a large cube. What is the ratio of the total surface areas of the smaller cubes and the large cube?**

A. 5 : 3
B. 4 : 1
C. 25 : 18
D. 7 : 3

Answer: C

Sol: **Given:**
Side of cubes = 3 cm, 4 cm, 5 cm

Formula Used:
Volume of cube = s^3
Surface area of cube = $6s^2$
Large cube side = $\sqrt[3]{\text{total volume}}$

Solution:
Volumes of small cubes:

$3^2 + 4^2 + 5^2$

= 27 + 64 + 125 = 216

Side of large cube = $\sqrt[3]{216} = 6$ cm

Surface areas:
Small cubes:
$6(3^2) + 6(4^2) + 6(5^2)$
= 6$(9 + 16 + 25) = 6 \times 50 = 300$

Large cube:
$6(6^2) = 6 \times 36 = 216$

Required ratio = 300 : 216 = 25 : 18

Q.95 ABCD is a cyclic quadrilateral whose side AB is a diameter of the circle through A, B, C and D. If angle ∠ADC = 129°, then what is the measure of ∠BAC?

A. 39°
B. 49°
C. 41°
D. 51°

Answer: A

Sol: **Given:**
ABCD is a cyclic quadrilateral whose side AB is a diameter of the circle through A, B, C and D.

∠ADC = 129°

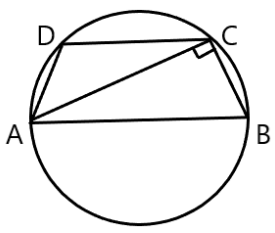
Concept used:

Sum of opposite angles of a cyclic quadrilateral = 180°

Angle in a semicircle = 90°

Sum of angles of a triangle = 180°

Solution:



∠D+∠B = 180° (Opposite angles of a cyclic quadrilateral)

$129^\circ + \angle B = 180^\circ$

$\angle B = 180^\circ - 129^\circ = 51^\circ$

$\angle ACB = 90^\circ$ (Angle in a semicircle)

In △ABC:

$\angle BAC + 51^\circ + 90^\circ = 180^\circ$ (Since sum of angles of a triangle is

$\angle BAC = 180^\circ - 90^\circ - 51^\circ = 39^\circ$

∴ The ∠BAC is 39°.

Q.96 Fill in the blank with an appropriate article :
Do you remember the saying: Even the darkest cloud has _____ silver lining ?

A. an
B. the
C. no article
D. a

Answer: D

Sol: The idiom "**a silver lining**" refers to **a hopeful or positive aspect in a difficult situation**.
Here, "**silver lining**" is used in a **general sense**, not referring to any specific lining. Therefore, the **indefinite article "a"** is correct.
· **Meaning in Hindi (Idiom):** हर बुरी स्थिति में भी कुछ न कुछ अच्छा होता है
Grammar Rule (Use of Articles):

· Use "**a/an**" when referring to something **in general** or **for the first time**.
· Use "**the**" for something **specific or already known**.
· **Example:**
· *She bought **a** book.* (any book)
· *She returned **the** book.* (a specific book)
Explanation of Options:
(a) **an** – Incorrect
· **Hindi Meaning:** एक
· Used before vowel sounds; "silver" does not begin with a vowel sound.
(b) **the** – Incorrect
· **Hindi Meaning:** वह / निश्चित
· Makes the phrase specific, which is not intended in a general proverb.
(c) **no article** – Incorrect
· An article is required before the singular countable noun phrase "silver lining".
(d) **a** – Correct
· **Hindi Meaning:** एक
· Correctly expresses a general truth in a proverb.
Conclusion:
The correct article is **"a"**, as the proverb refers to a general idea, not a specific instance.

Q.97 **Select the most appropriate ANTONYM of the given word.**
Praise

A. Improve
B. Appreciate
C. Condemn
D. Command

Answer: C

Sol: The correct antonym of the given word is (c) **condemn**.
Given word – Praise:
· **Meaning:** "Praise" means to express warm approval, admiration, or respect for someone or something, often for their good qualities, actions, or achievements. It is a positive expression of appreciation.
· Hindi meaning: **प्रशंसा करना, सराहना करना**.
Example (using "praise"):
The teacher **praised** the student for her excellent performance in the exam.
Correct answer word – Condemn:
· **Meaning:** "Condemn" means to criticize something or someone very strongly, to express complete disapproval, especially on moral grounds. It often involves judging an action as wrong, evil, or unacceptable.
· Hindi meaning: **निंदा करना, दोष देना, कठोर आलोचना करना**.
Example (using "condemn"):
Leaders from all over the world **condemned** the terrorist attack in the strongest terms.
Synonyms (for "praise"):
· **Applaud**, **commend**, **appreciate**, **extol**.
Antonyms (for "praise"):
· **Condemn**, **criticise**, **blame**, **denounce**.
Meanings of all the other given options:
· **(a) Improve** – to make something better, or to become better.
· Hindi: **सुधारना, बेहतर बनाना**.
· This refers to the process of enhancement, not the opposite of "praise".
· **(b) Appreciate** – to recognize the value or importance of someone or something, to admire or praise; also to be grateful for something.
· Hindi: **सराहना करना, कद्र करना**.
· This is actually **close in meaning to "praise"**, not its antonym.
· **(d) Command** – to give an order; also to have authority or control over something/someone.
· Hindi: **आदेश देना, शासन करना**.
· This is unrelated to praise/criticism and thus cannot be considered a true opposite of "praise".
Therefore, the word that **directly opposes the idea of praising** is **"condemn"**, making option (c) the correct antonym.

Q.98 **Select the most appropriate synonym of the given word.**
Impertinent

A. Impolite
B. Utilitarian
C. Arrogant
D. Important

Answer: A

Sol: The correct synonym of the given word is (a) **impolite**.

Impertinent: It means *rude and not showing proper respect*; also *too forward/inappropriately bold* in behaviour or speech. (Hindi meaning: असभ्य / बदतमीज़ / ढीठ)

It is used when someone crosses limits and speaks/acts without manners.

Example: The student made an **impertinent** remark to the teacher.

Impolite: It means *not having good manners; rude; not courteous*. (Hindi meaning: अशिष्ट / असभ्य)

It directly matches the core meaning of impertinent in this context.

Example: It is **impolite** to interrupt someone while they are speaking.

Synonyms: rude, insolent, discourteous, disrespectful.

Antonyms: polite, courteous, respectful, mannerly.

Meanings of all the other given options:

· **(b) Utilitarian:** Practical; focused on utility (उपयोगितावादी / व्यावहारिक)

· **(c) Arrogant:** Having excessive pride; haughty (अहंकारी / घमंडी)

· **(d) Important:** Significant; of great value (महत्वपूर्ण)

Q.99 **Select the most appropriate idiom or phrase to complete the given sentence.**

When my father lost his job, we had to live on my mother's earnings. Then we really started to _____.

A. put two and two together

B. keep the ball rolling

C. feel the pinch

D. measure half

Answer: C

Sol: **Option (c) is the correct meaning of the given idiom.**

Feel the pinch: This idiom means to **experience financial difficulty or hardship**, especially when money becomes less and expenses remain the same. (Hindi: "तंगी महसूस करना / आर्थिक परेशानी झेलना")

Example: After the salary cut, many employees started to **feel the pinch**.

Other related idioms and their meanings:

· **Tighten one's belt** – to reduce spending (Hindi: खर्च कम करना)

· **Make ends meet** – to manage with limited money (Hindi: जैसे-तैसे गुज़ारा करना)

· **In the red** – in debt/loss (Hindi: घाटे में होना)

· **Hand to mouth** – living with just enough to survive (Hindi: बहुत मुश्किल से गुज़ारा)

Q.100 **Find the meaning of the highlighted idiom in the given options:**

Unless we pull together as a nation, we can't make it progress at a fast pace.

A. pull the rope

B. labour hard

C. maintain peace

D. work unitedly

Answer: D

Sol:

Meaning of the Idiom:

"Pull together" is an idiom that means **to work together in a coordinated or united way towards a common goal**.

· **Meaning in Hindi:** एकजुट होकर काम करना / मिलकर प्रयास करना

· **Example Sentence:**

· *The team pulled together to finish the project before the deadline.*

· *If we all pull together, we can overcome this crisis.*

Explanation of Options:

· **(a) pull the rope** – *Literal meaning; incorrect*.

· **Meaning:** To actually pull a rope; not idiomatic.

· **Hindi:** रस्सी खींचना

· **(b) labour hard** – *Incorrect*.

· **Meaning:** To work hard individually

· **Hindi:** कड़ी मेहनत करना

· *This does not capture the idea of working **together** as a group.*

· **(c) maintain peace** – *Incorrect*.

· **Meaning:** To avoid conflict and stay peaceful

· **Hindi:** शांति बनाए रखना

· *This is unrelated to the context of cooperative effort.*

· **(d) work unitedly** – *Correct*.

· **Meaning:** To work in unity or together as a group

· **Hindi:** एकजुट होकर काम करना

· *Matches the context of national cooperation for progress.*

Similar Idioms:

· **Join forces** – to come together for a common purpose

· **Work hand in hand** – to cooperate closely

· **Band together** – to unite in order to achieve something

Therefore, the correct meaning of "pull together" is "work unitedly."

Q.101 **Select the correct option that converts the given sentence from active to passive voice.**
"Historians had been analyzing the social impact of the industrial revolution long before the discovery of primary labor records."

A. The social impact of the industrial revolution had been analyzed by historians long before the discovery of primary labor records.
B. The social impact of the industrial revolution was analyzed by historians long before the discovery of primary labor records.
C. The social impact of the industrial revolution had been being analyzed by historians long before the discovery of primary labor records.
D. The social impact of the industrial revolution has been analyzed by historians long before the discovery of primary labor records.

Answer: C

Sol: The correct passive voice of the given sentence is **(c) — "The social impact of the industrial revolution had been being analyzed by historians long before the discovery of primary labor records."**

Rule Explanation:

When the active voice is in **past perfect continuous tense**, the passive structure is formed by adding *had been being* + V_3 after the object. This structure, though rarely used, is grammatically correct for continuous perfect tenses.

Structure:

Active Voice: Subject + had been + V_4 (V_1 + ing) + Object

Passive Voice: Object + had been being + V_3 + by + Subject

Application:

Active: *Historians had been analyzing the social impact of the industrial revolution.*

Passive: *The social impact of the industrial revolution had been being analyzed by historians.*

This form maintains the continuous nature of the analysis before the event "the discovery of primary labor records."

Why other options are incorrect:

· (a) Changes to **past perfect passive**, removing the continuous aspect.

· (b) Simplifies to **past simple**, losing both perfect and continuous meaning.

· (d) Uses **present perfect**, breaking tense consistency with the phrase "long before."

Q.102 **Select the most appropriate synonym of the given word.**
Dilettante

A. Maestro
B. Actor
C. Addict
D. Amateur

Answer: D

Sol: **The correct synonym of the given word is (d) Amateur.**

Dilettante: A person who shows interest in an art/subject but lacks serious commitment or deep knowledge. (Hindi: शौक़िया / अधपका ज्ञान रखने वाला)

It often refers to someone who "dabbles" in something just for pleasure, not professionally.

Example: He was seen as a *dilettante* because he studied painting only as a weekend hobby.

Amateur: A person who does something for interest or enjoyment rather than as a profession. (Hindi: शौक़िया / गैर-पेशेवर)

An amateur may have skill, but the key idea is "not professional" and often "not expert-level."

Example: She is an *amateur* photographer who takes pictures for fun.

Synonyms: dabbler, nonprofessional, hobbyist, novice.

Antonyms: expert, professional, specialist, maestro.

Meanings of all the other given options:

· **(a) Maestro:** A great master, especially in music. (Hindi: उस्ताद / महान कलाकार)

· **(b) Actor:** A person who performs in plays/films. (Hindi: अभिनेता)

· **(c) Addict:** A person dependent on a substance/habit. (Hindi: लती)

Q.103 **Parts of a sentence are given below in jumbled order. Arrange the parts in the correct order to form a meaningful sentence.**
In the new millennium / essential / peace education / is / for human survival

A. In the new millennium for human survival peace education is essential.
B. Essential peace education is in the new millennium for human survival.
C. Peace education for human survival is in the new millennium essential.
D. Peace education is essential for human survival in the new millennium.

Answer: D

Sol: Option (d) is the correct order of the given sentences.

· The sentence follows the standard structure: **Subject + verb + complement** → Peace education + is + essential.

· The phrase **"for human survival"** correctly acts as a purpose phrase after "essential."

· The time phrase **"in the new millennium"** naturally comes at the end as an added context.

· Option (d) is the **most fluent and grammatically balanced** arrangement.

· Other options disturb clarity by placing time/purpose phrases before the main subject-verb link, making the sentence sound unnatural.

Q.104 **Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the correct order to form a meaningful and coherent paragraph.**

A.There are numerous forms of violence in societal structure, but the most visible are domestic, sexual, and race and class based violence.

B.The term 'violence' ranges from mental to physical conflict and wounds, which may result in war and armed conflicts.

C.Sexual violence encompasses both, forced sexual interaction and unwanted sexual conduct, such as paraphilia and bullying.

D.Violence is the use of verbal or physical force against oneself or another person, or other coercive activity against another person on the fear of being attacked.

A. DCAB
B. DBAC
C. ABDC
D. BCAD

Answer: B

Sol: Option (b) DBAC is the correct order of the given sentences.

· D must come first because it gives the definition of "Violence", which is the best way to introduce the topic.

· B logically follows because it expands the scope of violence (mental to physical) and explains how it can escalate to wars and armed conflicts.

· A comes next as it talks about different forms/types of violence in society (domestic, sexual, race/class-based), which naturally follows after the definition and scope.

· C fits at the end because it gives a specific explanation of one type mentioned in A, i.e., sexual violence, making the paragraph more detailed and coherent.

Therefore, the correct coherent sequence is D → B → A → C (DBAC).

Q.105 **Select the most appropriate option to fill in the blank (1)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

Even today, Ganga Prasad Tiwari does not hesitate to juggle multiple jobs to support his family and the hockey dreams of his son, Sharda Nand Tiwari. Once a (1) _____ born of necessity, his night shifts as a driver and wedding guard have now become a routine he refuses to abandon. Sharda, now a junior India international, often reminds his father that he need not (2) _____ himself so much, yet he admits that these sacrifices shaped his own resilience on the field. Having endured the heartbreak of missing a World Cup due to illness, Sharda knows how fragile opportunities can be. When India finally secured a bronze medal at the next edition, he felt his father's years of quiet struggle had at last been (3) _____. For Sharda, standing on the podium was not just a personal triumph but a (4) _____ to the unwavering support of a family that never stopped believing in him.

A. compulsion
B. indulgence
C. whim
D. luxury

Answer: A

Sol: The word that can be filled in the blank is ' **compulsion**' to make the sentence grammatically and contextually correct.

• **'Compulsion'** means a force or pressure that makes someone do something, often because of necessity or strong external demands. (ज़बरदस्ती / मजबूरी / विवशता)

• As per the context, the phrase "Once a _____ born of necessity" clearly suggests that Tiwari's extra jobs began as a **necessity**, not as a pleasure. Therefore, 'compulsion' fits in very well & hence, it is the correct option.

Meanings of other given words and why they are incorrect:

• **Indulgence** – doing something you enjoy too much or giving in to pleasure (अति-लाड़ / विलासिता); this is opposite in tone to a necessity-based sacrifice.

• **Whim** – a sudden, impulsive desire or change of mind (अचानक उठा हुआ ख़याल / सनक); his jobs were not taken up on impulse but due to family needs.

• **Luxury** – great comfort or expensive pleasure (ऐश-ओ-आराम / विलास); working long extra hours is clearly not a luxury.

• Thus, all the other given words have different meanings and do not fit in the context of the sentence.

Q.106 **Select the most appropriate option to fill in the blank (2)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank. Even today, Ganga Prasad Tiwari does not hesitate to juggle multiple jobs to support his family and the hockey dreams of his son, Sharda Nand Tiwari. Once a (1) _____ born of necessity, his night shifts as a driver and wedding guard have now become a routine he refuses to abandon. Sharda, now a junior India international, often reminds his father that he need not (2) _____ himself so much, yet he admits that these sacrifices shaped his own resilience on the field. Having endured the heartbreak of missing a World Cup due to illness, Sharda knows how fragile opportunities can be. When India finally secured a bronze medal at the next edition, he felt his father's years of quiet struggle had at last been (3) _____. For Sharda, standing on the podium was not just a personal triumph but a (4) _____ to the unwavering support of a family that never stopped believing in him.

A. overexert
B. flaunt
C. isolate
D. indulge

Answer: A

Sol: The word that can be filled in the blank is ' **overexert**' to make the sentence grammatically and contextually correct.
• '**Overexert**' means to work or strain oneself too much, beyond a safe or reasonable limit. (खुद को ज़्यादा थका देना / अत्यधिक मेहनत करना)
• As per the context, Sharda reminds his father that he "need not _____ himself so much"; he is telling him not to **push himself excessively** with too many jobs. Hence, 'overexert' fits the idea perfectly.
Meanings of other given words and why they are incorrect:
• **Flaunt** – to show off something in a very obvious or boastful way (दिखावा करना / इतराना); the father is not showing off, he is working hard.
• **Isolate** – to separate someone from others (अलग कर देना / पृथक करना); the sentence is not about separation from people but about physical and mental strain.
• **Indulge** – to allow oneself to enjoy something pleasant, often to excess (मौज-मस्ती में लिप्त होना / छूट देना); Sharda is not warning his father against pleasure, but against too much work.
• Thus, all the other given words have different meanings and do not fit in the context of the sentence.

Q.107 **Select the most appropriate option to fill in the blank (3)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank. Even today, Ganga Prasad Tiwari does not hesitate to juggle multiple jobs to support his family and the hockey dreams of his son, Sharda Nand Tiwari. Once a (1) _____ born of necessity, his night shifts as a driver and wedding guard have now become a routine he refuses to abandon. Sharda, now a junior India international, often reminds his father that he need not (2) _____ himself so much, yet he admits that these sacrifices shaped his own resilience on the field. Having endured the heartbreak of missing a World Cup due to illness, Sharda knows how fragile opportunities can be. When India finally secured a bronze medal at the next edition, he felt his father's years of quiet struggle had at last been (3) _____. For Sharda, standing on the podium was not just a personal triumph but a (4) _____ to the unwavering support of a family that never stopped believing in him.

A. vindicated
B. undermined
C. eclipsed
D. trivialized

Answer: A

Sol: The word that can be filled in the blank is ' **vindicated**' to make the sentence grammatically and contextually correct.
• '**Vindicated**' means shown to be right, justified, or proved correct after doubt or criticism. (सही साबित होना / न्यायसंगत सिद्ध होना)
• As per the context, when India finally won a bronze medal, Sharda felt that his father's years of struggle had been **proved worthwhile and justified**. So 'vindicated' expresses the sense that their sacrifices were finally recognised and rewarded.
Meanings of other given words and why they are incorrect:
• **Undermined** – weakened or damaged gradually (कमज़ोर करना / नींव हिला देना); a medal win does not weaken the value of sacrifices.
• **Eclipsed** – overshadowed or made less important by something else (मंद कर देना / छा जाना); the achievement does not overshadow the sacrifices; it honours them.
• **Trivialised** – made to seem unimportant or small (तुच्छ बना देना / महत्व घटा देना); again, the medal does the opposite—it highlights their importance.
• Thus, all the other given words have different meanings and do not fit in the context of the sentence.

Q.108 **Select the most appropriate option to fill in the blank (4)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank. Even today, Ganga Prasad Tiwari does not hesitate to juggle multiple jobs to support his family and the hockey dreams of his son, Sharda Nand Tiwari. Once a (1) _____ born of necessity, his night shifts as a driver and wedding guard have now become a routine he refuses to abandon. Sharda, now a junior India international, often reminds his father that he need not (2) _____ himself so much, yet he admits that these sacrifices shaped his own resilience on the field. Having endured the heartbreak of missing a World Cup due to illness, Sharda knows how fragile opportunities can be. When India finally secured a bronze medal at the next edition, he felt his father's years of quiet struggle had at last been (3) _____. For Sharda, standing on the podium was not just a personal triumph but a (4) _____ to the unwavering support of a family that never stopped believing in him.

A. tribute

B. reprieve
C. digression
D. anomaly

Answer: A

Sol: The word that can be filled in the blank is ' **tribute**' to make the sentence grammatically and contextually correct.
• '**Tribute**' means an act, statement, or gift that shows respect, gratitude, or admiration for someone. (श्रद्धांजलि / सम्मान-प्रदर्शन / कृतज्ञता का प्रतीक)
• As per the context, standing on the podium is described not just as Sharda's own triumph but as something that honours his family's support. Therefore, it functions as a **tribute** to them, which fits the sentence perfectly.
Meanings of other given words and why they are incorrect:
• **Reprieve** – a temporary delay of punishment or a brief relief from difficulty (दंड से अस्थायी मुक्ति / राहत); a medal is a celebration, not merely a postponement of trouble.
• **Digression** – a temporary departure from the main topic in speech or writing (विषयांतर / भटकाव); the podium moment is central, not a side-track.
• **Anomaly** – something unusual or inconsistent with the norm (विसंगति / असामान्यता); his victory is not presented as a strange exception but as a meaningful recognition.
• Thus, all the other given words have different meanings and do not fit in the context of the sentence.

Q.109 **The following sentence has been split into four segments. Identify the segment that contains a grammatical error.**
After a long discussion / over a period of ten hours, / the management / finally agreed to the agitating workers' demands.

A. finally agreed to the agitating workers' demands
B. over a period of ten hours
C. After a long discussion
D. the management

Answer: B

Sol: Option (b) contains an error.
Detailed explanation of error: Duration is most idiomatically expressed with **for + period**. The phrase "**over a period of ten hours**" is wordy and non-idiomatic here; it should be "**for ten hours.**" The corrected sentence is: After a long discussion **for ten hours**, the management finally agreed to the agitating workers' demands.
Grammatical rule used: Use **for + time span** to denote how long an action continues (duration). Over can indicate movement/coverage but is less natural with discussion for duration.
Example: They debated **for three hours** before voting.
Information booster: We often compress duration with compound adjectives: a **ten-hour** discussion (e.g., After a **ten-hour** discussion, the management…).

Q.110 **Select the option that can be used as a one-word substitute for the given group of words.**
Walk or move in a leisurely or aimless way

A. Wonder
B. Yonder
C. Perch
D. Wander

Answer: D

Sol: **The correct one-word for the given group of words is (d) Wander.**
Wander means to walk or move slowly without a fixed purpose or direction, often casually and aimlessly. (इधर-उधर घूमना / बिना उद्देश्य भटकना)
It is used when someone moves around freely rather than going straight to a particular destination.
Example: We decided to **wander** through the market streets after dinner.
Meanings of the given other options:
· **(a) Wonder:** to feel curiosity or surprise / marvel (आश्चर्य करना / सोच में पड़ना)
· **(b) Yonder:** at some distance; over there (वहाँ दूर / उस ओर)
· **(c) Perch:** to sit or rest on a high place (ऊँचाई पर बैठना / टेक लगाकर बैठना)

Q.111 **Select the most appropriate antonym of the given word.**
Perfidious

A. Betraying
B. Faithless
C. loyal
D. Treacherous

Answer: C

Sol: The correct antonym of the given word is (c) **loyal**.
Perfidious: deceitful and untrustworthy; deliberately treacherous. (Hindi: विश्वासघाती, कपटी)
Example (given word): A perfidious friend revealed my secrets.
Loyal: giving or showing firm and constant support or allegiance; faithful to a person, cause, or institution. (Hindi: निष्ठावान, वफ़ादार)
Example (answer word): She remained loyal to her principles despite pressure.
Synonyms (of "perfidious"): treacherous, faithless, disloyal, duplicitous.
Antonyms (of "perfidious"): loyal, faithful, steadfast, trustworthy.
Meanings of all the other given options:
· (a) **Betraying**: being disloyal; revealing in violation of trust. (Hindi: दग़ा देने वाला, विश्वासघात करने वाला)
· (b) **Faithless**: not loyal or reliable; without belief or trust. (Hindi: धोखेबाज़, बेवफ़ा)
· (d) **Treacherous**: guilty of betrayal or deception. (Hindi: विश्वासघाती, छलपूर्ण)

Q.112 **Select the most appropriate option that can substitute the highlighted segment in the given sentence.**
They carefully tended a large group of sheep for their personal use.

A. a band of sheep
B. a flock of sheep
C. a pack of sheep
D. many sheep

Answer: B

Sol: **The correct substitution of the highlighted words is (b) a flock of sheep.**
Explanation: In English, specific collective nouns are used for groups of animals. For **sheep**, the standard and most appropriate collective noun is **"flock."**
Therefore, "a large group of sheep" should be replaced with **"a flock of sheep"** to make the sentence precise and idiomatic.
Options like band and pack are used for other animals/contexts, so they sound incorrect here.
Grammatical rule used: Collective Noun Rule — Use the correct collective noun for a particular category of animals (e.g., flock for sheep/birds, herd for cattle, pack for wolves/dogs).
Example: The shepherd guided **a flock of sheep** across the field.
Info booster: Remember some common pairs— **flock (sheep/birds)**, **herd (cattle/elephants/deer)**, **pack (wolves/dogs)**, **swarm (bees/insects)**.

Q.113 **Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.**
Educational platforms can be a productive way (1)/for parents to use technology (2)/to support there child's early learning (3)/.No error (4)

A. 1
B. 2
C. 3
D. 4

Answer: C

Sol:
Option **(3)** contains an error.
Explanation:
The phrase **"there child's early learning"** is incorrect.
The word **"there"** means *at that place*, which does not fit the context.
The correct word should be **"their"**, which is a possessive pronoun used to show ownership (their child).
Hence, the correct phrase is **"to support their child's early learning."**
Grammatical rule used:
Use **possessive pronouns (my, your, his, her, its, our, their)** before a noun to show possession.
Explanation of the grammatical rule in Hindi:
Possessive pronoun (my, your, his, her, its, our, **their**) का प्रयोग संज्ञा से पहले स्वामित्व दिखाने के लिए किया जाता है। "There" का अर्थ *वहाँ* होता है, इसलिए यहाँ गलत है।
Example:
• *Parents should monitor **their** child's online activities.*
• *Students submitted **their** assignments on time.*

Q.114 **A sentence is provided in indirect speech. From the four given options, choose the one that most accurately conveys the sentence in its corresponding direct speech.**
He said that he would join the meeting after lunch.

A. “I will join the meeting after lunch,” he said.
B. “I would join the meeting after lunch,” he said.
C. “I shall join the meeting after lunch,” he said.
D. “I can join the meeting after lunch,” he said.

Answer: A

Sol: The correct direct speech is (a) **“I will join the meeting after lunch,” he said.**
Rules of conversion (in detail):
· **Backshift reversal:** Indirect would often reflects direct **will** when the original speech was simultaneous/future relative to the time of speaking.
· **Pronoun adjustment:** Indirect he (reported subject) → Direct speaker **I**.
· **Retention of adverbial:** after lunch remains unchanged as it still refers to a future/relative time from the original utterance.
· **Punctuation/format:** Quotation marks enclose the exact words; reporting clause may follow or precede.
· **Example:** Indirect: She said that she would call later. → Direct: “I will call later,” she said.
· **Why other options are incorrect:**
· (b) **would** in direct speech usually expresses willingness in certain contexts, but here it misrepresents the original present-future intent.
· (c) **shall** is formal and mainly with I/We for offers/promises; while possible, exam-standard reversal from would is **will**.
· (d) **can** alters meaning to ability, not future intention.

Q.115 **Identify the error in tense and choose the correct form of the verb in present tense from the following options.**
The train is arriving in Bangalore at 9 o’clock tomorrow morning.

A. has to arrive
B. will be arriving
C. have been arriving
D. arrives

Answer: D

Sol: The correct substitution of the highlighted words is (d) **arrives**.
Explanation: In standard grammar questions, a fixed timetable or scheduled event (like the arrival/departure of trains, buses, flights) is expressed in the **simple present tense**, even if it refers to the future. So, instead of “is arriving”, we use “arrives” to show a fixed, scheduled event: *The train arrives in Bangalore at 9 o’clock tomorrow morning.*
Grammatical rule used:
· We use **Simple Present Tense** to talk about **fixed timetables and schedules** (especially for public transport, official programs, etc.).
· Structure: **Subject + V1 (s/es) + object + time expression**
· e.g. *The plane **leaves** at 6 p.m.*
· Present Continuous (**is/am/are + V-ing**) is used for actions happening **now** or **temporary/definite personal arrangements**, not usually for official timetables in exam grammar.
Example:
· *The bus **leaves** Delhi at 7 a.m. tomorrow.*
· *The meeting **starts** at 10 a.m. next Monday.*
Why other options are incorrect:
· (a) **has to arrive** – expresses **obligation/necessity** (आना पड़ता है), not a neutral timetable.
· (b) **will be arriving** – Future Continuous; grammatically possible in spoken English but the question specifically asks for the **correct form in present tense** for a schedule.
· (c) **have been arriving** – Present Perfect Continuous; used for an action that **started in the past and is still continuing**, which is illogical with a specific future time “tomorrow morning”.
Information booster (Exam point):
· For **timetables, routines, and schedules**, exam questions almost always prefer **Simple Present**:
· *The train **reaches** Jaipur at 5 p.m.*
· *Our college **reopens** next week.*

Q.116

Which word is the ANTONYM of 'pioneering' as used in the passage?
Read the given passage and answer the questions that follow.
The First Wave of Feminism, emerging in the late 19th and early 20th centuries, was a pioneering movement advocating for women's legal and political rights. Rooted in Enlightenment ideals of equality and justice, this wave primarily focused on suffrage, property rights and access to education. Leaders like Susan B. Anthony, Elizabeth Cady Stanton and Emmeline Pankhurst played pivotal roles in mobilising women through writings, speeches and organised protests. The Seneca Falls Convention of 1848, often seen as the catalyst for the movement, produced the Declaration of Sentiments, demanding equal rights. Women’s relentless activism culminated in landmark victories, such as the passage of the Nineteenth Amendment in the United States and the Representation of the People Act in Britain. Despite its successes, the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class. However, the First Wave laid the foundation for subsequent feminist movements, shaping future struggles for gender equality. Its achievements inspired later waves of feminism, which sought to address broader issues such as workplace rights, reproductive freedom and intersectionality. The First Wave remains a crucial chapter in the ongoing fight for women's empowerment.

A. Revolutionary

B. Progressive
C. Innovative
D. Traditional

Answer: D

Sol: The correct answer is option **(d) Traditional.**
The word *pioneering* means being among the first to explore or develop something new or original — showing initiative or innovation. (Hindi meaning – अग्रणी या नवप्रवर्तक). In the passage, it describes how the First Wave of Feminism introduced **new ideas and movements** for women's rights. Hence, its opposite would be *traditional*, which means following old customs or methods, lacking innovation. (Hindi meaning – परंपरागत, पारंपरिक).
Explanation of context of passage:
The author refers to the movement as *pioneering* because it introduced fresh perspectives on women's equality and broke old barriers. The antonym *traditional* suggests sticking to old practices, opposite of what the movement represented.
Other options are incorrect because:
· **(a) Revolutionary:** Similar in meaning to pioneering (innovative, ground-breaking).
· **(b) Progressive:** Also close to pioneering (forward-looking).
· **(c) Innovative:** Same in meaning — introducing new ideas.
Hence, **Traditional** is the correct antonym.

Q.117

Which of the following was NOT a major focus of the First Wave of Feminism?
Read the given passage and answer the questions that follow.
The First Wave of Feminism, emerging in the late 19th and early 20th centuries, was a pioneering movement advocating for women's legal and political rights. Rooted in Enlightenment ideals of equality and justice, this wave primarily focused on suffrage, property rights and access to education. Leaders like Susan B. Anthony, Elizabeth Cady Stanton and Emmeline Pankhurst played pivotal roles in mobilising women through writings, speeches and organised protests. The Seneca Falls Convention of 1848, often seen as the catalyst for the movement, produced the Declaration of Sentiments, demanding equal rights. Women's relentless activism culminated in landmark victories, such as the passage of the Nineteenth Amendment in the United States and the Representation of the People Act in Britain. Despite its successes, the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class. However, the First Wave laid the foundation for subsequent feminist movements, shaping future struggles for gender equality. Its achievements inspired later waves of feminism, which sought to address broader issues such as workplace rights, reproductive freedom and intersectionality. The First Wave remains a crucial chapter in the ongoing fight for women's empowerment.

A. Equal access to education
B. Property rights
C. Women's suffrage
D. Workplace discrimination laws

Answer: D

Sol: The correct answer is option **(d) Workplace discrimination laws.**
The passage clearly mentions that the First Wave focused on *suffrage (voting rights)*, *property rights*, and *access to education*. These were the key legal and political issues of that era. (Hindi meaning – कार्यस्थल भेदभाव कानून प्रथम चरण का मुद्दा नहीं था)।
Explanation of context of passage:
The movement arose in the late 19th and early 20th centuries, long before modern workplace laws existed. The concept of workplace discrimination emerged much later, particularly during the **Second Wave of Feminism** in the mid-20th century.
Other options are incorrect because:
· **(a) Equal access to education:** Explicitly mentioned as a major focus.
· **(b) Property rights:** One of the core demands of early feminists.
· **(c) Women's suffrage:** The main goal of the movement, achieved through the Nineteenth Amendment.
Thus, *Workplace discrimination laws* were **not** a focus of the First Wave.

Q.118

What is the tone of the passage?
Read the given passage and answer the questions that follow.
The First Wave of Feminism, emerging in the late 19th and early 20th centuries, was a pioneering movement advocating for women's legal and political rights. Rooted in Enlightenment ideals of equality and justice, this wave primarily focused on suffrage, property rights and access to education. Leaders like Susan B. Anthony, Elizabeth Cady Stanton and Emmeline Pankhurst played pivotal roles in mobilising women through writings, speeches and organised protests. The Seneca Falls Convention of 1848, often seen as the catalyst for the movement, produced the Declaration of Sentiments, demanding equal rights. Women's relentless activism culminated in landmark victories, such as the passage of the Nineteenth Amendment in the United States and the Representation of the People Act in Britain. Despite its successes, the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class. However, the First Wave laid the foundation for subsequent feminist movements, shaping future struggles for gender equality. Its achievements inspired later waves of feminism, which sought to address broader issues such as workplace rights, reproductive freedom and intersectionality. The First Wave remains a crucial chapter in the ongoing fight for women's empowerment.

A. Sarcastic and dismissive
B. Romanticised and exaggerated
C. Passionate and biased

D. Neutral and historical

Answer: D

Sol: The correct answer is option **(d) Neutral and historical.**
The tone of the passage is factual, balanced, and informative. The writer provides a chronological account of the movement, highlighting both achievements and criticisms objectively. (Hindi meaning – निष्पक्ष और ऐतिहासिक स्वर)।
Explanation of context of passage:
The author uses a historical narrative tone, presenting facts such as key leaders, events like the *Seneca Falls Convention*, and major laws passed. The passage neither glorifies nor mocks the movement — it simply records history.
Other options are incorrect because:
· **(a) Sarcastic and dismissive:** There is no ridicule or irony in the text.
· **(b) Romanticised and exaggerated:** The passage does not idealize the movement emotionally.
· **(c) Passionate and biased:** The tone is not emotionally charged or one-sided.
Hence, the tone is **neutral and historical**.

Q.119

Which title best captures the essence of the passage?
Read the given passage and answer the questions that follow.
The First Wave of Feminism, emerging in the late 19th and early 20th centuries, was a pioneering movement advocating for women's legal and political rights. Rooted in Enlightenment ideals of equality and justice, this wave primarily focused on suffrage, property rights and access to education. Leaders like Susan B. Anthony, Elizabeth Cady Stanton and Emmeline Pankhurst played pivotal roles in mobilising women through writings, speeches and organised protests. The Seneca Falls Convention of 1848, often seen as the catalyst for the movement, produced the Declaration of Sentiments, demanding equal rights. Women's relentless activism culminated in landmark victories, such as the passage of the Nineteenth Amendment in the United States and the Representation of the People Act in Britain. Despite its successes, the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class. However, the First Wave laid the foundation for subsequent feminist movements, shaping future struggles for gender equality. Its achievements inspired later waves of feminism, which sought to address broader issues such as workplace rights, reproductive freedom and intersectionality. The First Wave remains a crucial chapter in the ongoing fight for women's empowerment.

A. Women's Struggles in the 21st Century
B. The Political Impact of the Nineteenth Amendment
C. The First Wave of Feminism: A Fight for Equality
D. The Evolution of Modern Feminism

Answer: C

Sol: The correct answer is option **(c)**.
The passage focuses entirely on the **First Wave of Feminism**, explaining its **goals, achievements, leaders, and limitations**, all centred on the fight for gender equality. (Hindi meaning – स्त्री अधिकारों की पहली लहर: समानता के लिए संघर्ष)।
Explanation of context of passage:
The text traces the origins and impact of the First Wave and ends by highlighting how it shaped later feminist movements. Hence, the title *A Fight for Equality* best summarizes the main theme.
Other options are incorrect because:
· **(a) Women's Struggles in the 21st Century:** The passage deals with the 19th–20th century, not the 21st.
· **(b) The Political Impact of the Nineteenth Amendment:** The amendment is mentioned but not the sole focus.
· **(d) The Evolution of Modern Feminism:** The passage doesn't discuss later waves in detail.
Thus, option **(c)** captures the central idea perfectly.

Q.120

What can be inferred about the limitations of the First Wave of Feminism?
Read the given passage and answer the questions that follow.
The First Wave of Feminism, emerging in the late 19th and early 20th centuries, was a pioneering movement advocating for women's legal and political rights. Rooted in Enlightenment ideals of equality and justice, this wave primarily focused on suffrage, property rights and access to education. Leaders like Susan B. Anthony, Elizabeth Cady Stanton and Emmeline Pankhurst played pivotal roles in mobilising women through writings, speeches and organised protests. The Seneca Falls Convention of 1848, often seen as the catalyst for the movement, produced the Declaration of Sentiments, demanding equal rights. Women's relentless activism culminated in landmark victories, such as the passage of the Nineteenth Amendment in the United States and the Representation of the People Act in Britain. Despite its successes, the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class. However, the First Wave laid the foundation for subsequent feminist movements, shaping future struggles for gender equality. Its achievements inspired later waves of feminism, which sought to address broader issues such as workplace rights, reproductive freedom and intersectionality. The First Wave remains a crucial chapter in the ongoing fight for women's empowerment.

A. It was largely ineffective and failed to achieve its goals.
B. It successfully addressed all issues of gender inequality.
C. It did not influence later feminist movements.
D. It only benefited elite women and ignored other marginalised groups.

Answer: D

Sol: The correct answer is option **(d).**

The passage clearly states that *"the movement was criticised for primarily addressing the concerns of white, middle-class women, often neglecting the experiences of women of colour and the working class."* This indicates that its reach was limited to privileged sections. (Hindi meaning – यह आंदोलन केवल उच्च वर्ग की महिलाओं तक सीमित रहा और अन्य उपेक्षित वर्गों की अनदेखी की गई।)

Explanation of context of passage:

While the First Wave achieved remarkable legal progress, it lacked inclusivity. It set the stage for later movements to focus on intersectionality and the experiences of all women, not just a specific class.

Other options are incorrect because:

· **(a)** Wrong – it was successful in achieving suffrage and property rights.

· **(b)** Wrong – it did not address *all* issues of gender inequality.

· **(c)** Wrong – it clearly *influenced later feminist movements*.

Hence, the correct inference is that it **mainly benefited elite women** and excluded others.