TS EAMCET 2026 May 4 Shift 1

Question Paper with Solutions (Memory-Based)

Conducted by National Testing Agency (NTA)

General Instructions

(i) The test is of 3 hours duration.

(ii) This test paper consists of 160 questions. The maximum marks are 720.

(iii) Physics and Chemistry contains 40 questions each and Biology (Botany and Zoology) contains 80 questions.

(iv) Each question carries +1 marks for correct answer and there is no negative marking for wrong answer.

1. Which one of the following is the correct description for a mature embryo sac?

(A) 7 nuclei and 8 cells

(B) 8 nuclei and 8 cells

(C) 8 nuclei and 7 cells

(D) 7 nuclei and 7 cells

Correct Answer: (C) 8 nuclei and 7 cells

Solution:

Step 1: Concept

The female gametophyte or embryo sac in angiosperms typically develops through a process called megasporogenesis and megagametogenesis.

Step 2: Meaning

A mature embryo sac is the structure within the ovule where fertilization occurs, containing the egg cell and associated nuclei.

Step 3: Analysis

During development, the functional megaspore undergoes three sequential mitotic divisions of the nucleus without immediate cytokinesis. This results in 8 nuclei. Eventually, cell walls are laid down around six of the nuclei, forming three cells at the micropylar end (egg apparatus) and three at the chalazal end (antipodals). The remaining two nuclei (polar nuclei) stay in a large single central cell.

Step 4: Conclusion

This distribution results in a structure that has 8 nuclei contained within 7 distinct cells.

Final Answer: (C)

Quick Tip: Remember the 8-7 rule for angiosperms: 8 "N"uclei in 7 "C"ells.

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2. Edible part of Ginger is:

(A) Root

(B) Leaf

(C) Stem

(D) Flower

Correct Answer: (C) Stem

Solution:

Step 1: Concept

Plants often modify their organs to store food or survive unfavorable conditions. These modifications can occur in roots, stems, or leaves.

Step 2: Meaning

Ginger is a perennial herb that grows horizontally under the soil surface.

Step 3: Analysis

Although it grows underground, ginger possesses nodes, internodes, and scale leaves, which are characteristic features of a stem rather than a root. Specifically, it is a modified underground stem known as a rhizome.

Step 4: Conclusion

Since the structure consumed is a rhizome, the edible part is botanically classified as a stem.

Final Answer: (C)

Quick Tip: If it has nodes and internodes, it is a stem, even if it is underground!

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3. Which enzyme is responsible for primary CO2 fixation in C4 plants?

(A) RuBisCO

(B) PEP carboxylase (PEP)

(C) Carbonic anhydrase

(D) Pyruvate kinase

Correct Answer: (B) PEP carboxylase (PEP)

Solution:

Step 1: Concept

C_4 plants have evolved a mechanism to concentrate CO_2 around RuBisCO to minimize photorespiration.

Step 2: Meaning

Primary fixation refers to the first step where atmospheric CO_2 is captured into an organic molecule.

Step 3: Analysis

In C_4 plants, the initial CO_2 fixation occurs in the mesophyll cells. The enzyme Phosphoenolpyruvate (PEP) carboxylase catalyzes the reaction between CO_2 (as HCO_3^-) and PEP to form a 4-carbon acid. RuBisCO is involved later in the bundle sheath cells during the secondary fixation.

Step 4: Conclusion

Therefore, PEP carboxylase is the specific enzyme for the primary fixation step in the C_4 pathway.

Final Answer: (B)

Quick Tip: C_4 plants use PEP Case first; C_3 plants only use RuBisCO.

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4. The process of plasmolysis occurs when:

(A) Water moves into the cell

(B) Water moves out of the cell

(C) No movement of water

(D) Cell wall dissolves

Correct Answer: (B) Water moves out of the cell

Solution:

Step 1: Concept

Plasmolysis is a phenomenon related to osmosis and the movement of water across the semi-permeable plasma membrane of a plant cell.

Step 2: Meaning

It is the shrinkage of the protoplast away from the cell wall.

Step 3: Analysis

When a plant cell is placed in a hypertonic solution (a solution with a higher solute concentration than the cell sap), water moves out of the cell due to osmosis. This loss of turgor pressure causes the cytoplasm to contract.

Step 4: Conclusion

The outward movement of water (exosmosis) is the direct cause of the shrinkage observed in plasmolysis.

Final Answer: (B)

Quick Tip: "Plasmolysis" = "Plasma" membrane "Lysis" (shrinking) due to water leaving.

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5. Which of the following is a criterion for essentiality of an element in plants?

(A) It must be present in high concentration

(B) It must be easily available in soil

(C) The element must be directly involved in metabolism

(D) It must be required for aesthetic value

Correct Answer: (C) The element must be directly involved in metabolism

Solution:

Step 1: Concept

Arnon and Stout proposed specific criteria to determine if a mineral element is truly essential for plant growth and development.

Step 2: Meaning

An essential element is one without which the plant cannot complete its life cycle or produce seeds.

Step 3: Analysis

High concentration (macronutrients) or availability in soil are not strictly criteria for "essentiality"—some essential micronutrients are needed in tiny amounts. The key requirement is that the element's role must be irreplaceable and it must be directly part of an essential metabolic process or structure.

Step 4: Conclusion

Direct involvement in metabolism is one of the three primary pillars of the criteria for essentiality.

Final Answer: (C)

Quick Tip: Essential = Irreplaceable + Necessary for life cycle + Direct metabolic role.

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6. The largest gland in the human body is:

(A) Pancreas

(B) Liver

(C) Thyroid

(D) Adrenal

Correct Answer: (B) Liver

Solution:

Step 1: Concept

Glands are organs that produce and release substances. In the human body, they are categorized based on their size, function, and whether they have ducts.

Step 2: Meaning

The liver is a vital organ located in the upper right quadrant of the abdomen, performing over 500 functions including detoxification and protein synthesis.

Step 3: Analysis

While the pancreas and thyroid are significant glands, they are much smaller in mass. The liver typically weighs between 1.2 to 1.5 kg in an adult, making it both the largest internal organ and the largest gland.

Step 4: Conclusion

Due to its substantial mass and volume compared to other secretory organs, the liver is classified as the largest gland.

Final Answer: (B)

Quick Tip: Skin is the largest organ overall, but Liver is the largest gland and largest internal organ.

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7. Powerhouse of the cell is known as:

(A) Nucleus

(B) Ribosome

(C) Mitochondria

(D) Golgi body

Correct Answer: (C) Mitochondria

Solution:

Step 1: Concept

Cell organelles have specific roles. Energy production is localized to specific double-membraned structures.

Step 2: Meaning

A "powerhouse" refers to the site where the energy currency of the cell, Adenosine Triphosphate (ATP), is generated.

Step 3: Analysis

The nucleus stores genetic info, ribosomes synthesize proteins, and Golgi bodies package them. Mitochondria perform aerobic respiration, converting nutrients into ATP through the Krebs cycle and electron transport chain.

Step 4: Conclusion

Because mitochondria produce the energy required for cellular activities, they are universally termed the powerhouse of the cell.

Final Answer: (C)

Quick Tip: Mitochondria = ATP Factory. No Mitochondria, no energy for the cell!

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8. Which of the following is a flightless bird?

(A) Sparrow

(B) Pigeon

(C) Ostrich

(D) Peacock

Correct Answer: (C) Ostrich

Solution:

Step 1: Concept

Flightless birds are species that have lost the ancestral ability to fly through evolution, usually developing strong legs for running or swimming instead.

Step 2: Meaning

These birds lack a "keel" on their sternum (breastbone), which is the bone that anchors powerful flight muscles.

Step 3: Analysis

Sparrows, pigeons, and peacocks are all capable of flight. The ostrich belongs to a group called ratites, which are characterized by their large size and inability to fly.

Step 4: Conclusion

The ostrich is the largest living flightless bird, relying on its incredible running speed for survival.

Final Answer: (C)

Quick Tip: Flightless birds (Ratites) include the Ostrich, Emu, Kiwi, and Penguin.

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9. Total number of bones in the adult human body is:

(A) 200

(B) 206

(C) 210

(D) 250

Correct Answer: (B) 206

Solution:

Step 1: Concept

The human skeletal system changes from birth to adulthood as certain bones fuse together.

Step 2: Meaning

An adult skeleton is the fully developed framework of the body once growth plates have closed and bone fusion is complete.

Step 3: Analysis

Infants are born with approximately 270 to 300 bony elements. As a person grows, many of these bones (like those in the skull and sacrum) fuse. By adulthood, the standard count is 206

bones.

Step 4: Conclusion

The definitive number of distinct bones in a typical adult human skeleton is 206.

Final Answer: (B)

Quick Tip: Babies have more bones than adults! They fuse as you grow up.

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10. Which hormone is responsible for the "fight or flight" response?

(A) Insulin

(B) Thyroxine

(C) Adrenaline

(D) Estrogen

Correct Answer: (C) Adrenaline

Solution:

Step 1: Concept

The endocrine system releases hormones to help the body react quickly to stress or perceived danger.

Step 2: Meaning

The "fight or flight" response is a physiological reaction that increases heart rate, blood pressure, and energy supplies.

Step 3: Analysis

Insulin regulates blood sugar, thyroxine controls metabolism, and estrogen is a sex hormone. Adrenaline (epinephrine), secreted by the adrenal glands, triggers the immediate physical changes needed to either confront or flee from a threat.

Step 4: Conclusion

Adrenaline is the primary hormone that prepares the body for sudden physical exertion during emergencies.

Final Answer: (C)

Quick Tip: Adrenaline = Emergency Hormone. Think of the "Adrenal Rush" during a scare.

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11. Dimensions of Universal Gravitational Constant (G) are:

(A) $[M^{-1}L^3T^{-2}]$

(B) $[ML^2T^{-2}]$

(C) $[M^{-2}L^3T^{-1}]$

(D) $[M^1L^3T^{-2}]$

Correct Answer: (A) $[M^{-1}L^3T^{-2}]$

Solution:

Step 1: Concept

Newton's Law of Gravitation states $F = \frac{Gm_1m_2}{r^2}$. To find the dimensions of G, we rearrange the formula to $G = \frac{Fr^2}{m_1m_2}$.

Step 2: Meaning

Dimensions represent the physical nature of a quantity in terms of base units: Mass (M), Length (L), and Time (T).

Step 3: Analysis

The dimension of Force (F) is $[MLT^{-2}]$, distance (r^2) is $[L^2]$, and mass product (m_1m_2) is $[M^2]$. Substituting these: $[G] = \frac{[MLT^{-2}][L^2]}{[M^2]}$.

Step 4: Conclusion

Simplifying the expression gives $[M^{1-2}L^{1+2}T^{-2}]$, which results in $[M^{-1}L^3T^{-2}]$.

Final Answer: (A)

Quick Tip: Always derive G from $F = \frac{Gm^2}{r^2}$ to avoid memorization errors.

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12. A body starts from rest and moves with uniform acceleration. The ratio of distance covered in 4th and 3rd seconds is:

(A) 4:3

(B) 7:5

(C) 16:9

(D) 5:7

Correct Answer: (B) 7:5

Solution:

Step 1: Concept

The distance covered in the n^{th} second of motion is given by the formula: $S_n = u + \frac{a}{2}(2n-1)$.

Step 2: Meaning

Since the body starts from rest, the initial velocity $u = 0$. The formula simplifies to $S_n \propto (2n-1)$.

Step 3: Analysis

For the 4th second ($n = 4$): $S_4 = \frac{a}{2}(2 \times 4 - 1) = \frac{7a}{2}$. For the 3rd second ($n = 3$): $S_3 = \frac{a}{2}(2 \times 3 - 1) = \frac{5a}{2}$.

Step 4: Conclusion

The ratio $S_4 : S_3$ is $\frac{7a/2}{5a/2} = 7 : 5$.

Final Answer: (B)

Quick Tip: For $u = 0$, distances in successive seconds follow the ratio of odd numbers: $1 : 3 : 5 : 7...$

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13. The work done by a centripetal force is:

(A) Positive

(B) Negative

(C) Zero

(D) Infinite

Correct Answer: (C) Zero

Solution:

Step 1: Concept

Work done is defined as $W = \vec{F} \cdot \vec{d} = Fd\cos\theta$, where θ is the angle between force and displacement.

Step 2: Meaning

Centripetal force always acts towards the center of the circular path.

Step 3: Analysis

In uniform circular motion, the instantaneous displacement is tangential to the circle, while the centripetal force is radial. Therefore, the angle θ between them is always $90°$.

Step 4: Conclusion

Since $\cos 90° = 0$, the work done by the centripetal force is always zero.

Final Answer: (C)

Quick Tip: Force perpendicular to motion? Work is always Zero!

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14. The escape velocity from the Earth's surface is approximately:

(A) 9.8 km/s

(B) 7.2 km/s

(C) 15 km/s

(D) 11.2 km/s

Correct Answer: (D) 11.2 km/s

Solution:

Step 1: Concept

Escape velocity (v_e) is the minimum speed needed for an object to break free from a planet's gravitational pull without further propulsion.

Step 2: Meaning

It is calculated using the formula $v_e = \sqrt{2gR}$, where g is acceleration due to gravity and R is the radius of the planet.

Step 3: Analysis

For Earth, $g \approx 9.8\ \text{m/s}^2$ and $R \approx 6.4 \times 10^6$ m. Substituting these values: $v_e = \sqrt{2 \times 9.8 \times 6.4 \times 10^6} \approx 11,200$ m/s.

Step 4: Conclusion

Converting to kilometers, we get approximately 11.2 km/s.

Final Answer: (D)

Quick Tip: Don't confuse g ($9.8\ m/s^2$) with v_e ($11.2\ km/s$).

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15. The unit of coefficient of viscosity is:

(A) Newton

(B) Poise

(C) Joule

(D) Watt

Correct Answer: (B) Poise

Solution:

Step 1: Concept

Viscosity is the internal friction of a fluid. The coefficient of viscosity (η) is defined by Newton's law of viscosity: $F = \eta A \frac{dv}{dx}$.

Step 2: Meaning

The SI unit of η is Pascal-second ($Pa \cdot s$) or $kg \cdot m^{-1} \cdot s^{-1}$.

Step 3: Analysis

In the CGS system, the unit is called "Poise" (named after Jean Léonard Marie Poiseuille). 1 $Pa \cdot s = 10$ Poise.

Step 4: Conclusion

Among the given options, Newton (force), Joule (energy), and Watt (power) are incorrect. Poise is the standard unit for viscosity.

Final Answer: (B)

Quick Tip: Remember: 1 Poiseuille (SI) = 10 Poise (CGS).

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16. Which of the following has the highest electronegativity?

(A) Oxygen

(B) Chlorine

(C) Fluorine

(D) Nitrogen

Correct Answer: (C) Fluorine

Solution:

Step 1: Concept

Electronegativity is the tendency of an atom to attract a shared pair of electrons towards itself in a chemical bond.

Step 2: Meaning

On the Pauling scale, electronegativity generally increases across a period (left to right) and decreases down a group (top to bottom).

Step 3: Analysis

Nitrogen, Oxygen, and Fluorine are in the same period. Fluorine is the furthest to the right in this group. Chlorine is below Fluorine in the halogen group, meaning its electronegativity is lower than Fluorine's.

Step 4: Conclusion

Fluorine is the most electronegative element in the entire periodic table with a value of approximately 4.0.

Final Answer: (C)

Quick Tip: Remember "FON": Fluorine, Oxygen, and Nitrogen are the top three electronegative elements.

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17. The oxidation state of Mn in $KMnO_4$ is:

(A) +7

(B) +6

(C) +5

(D) +4

Correct Answer: (A) +7

Solution:

Step 1: Concept

The sum of oxidation states of all atoms in a neutral compound must equal zero.

Step 2: Meaning

We use standard oxidation numbers: Potassium (K) is +1 and Oxygen (O) is -2.

Step 3: Analysis

Let the oxidation state of Mn be x. The equation is: $(+1) + x + 4(-2) = 0$. This simplifies to: $1 + x - 8 = 0$, which means $x - 7 = 0$.

Step 4: Conclusion

Solving for x, we find that $x = +7$.

Final Answer: (A)

Quick Tip: In $KMnO_4$, Mn is in its highest possible oxidation state (+7).

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18. Which gas is used in the manufacture of Vanaspati Ghee?

(A) Oxygen

(B) Nitrogen

(C) Hydrogen

(D) Carbon dioxide

Correct Answer: (C) Hydrogen

Solution:

Step 1: Concept

Vegetable oils are unsaturated fats (containing double bonds). To make them solid (like ghee), they must undergo a chemical process called hydrogenation.

Step 2: Meaning

Hydrogenation involves the addition of hydrogen atoms to the double bonds of the oil molecules in the presence of a catalyst like Nickel.

Step 3: Analysis

Oxygen would cause rancidity, Nitrogen is inert, and CO_2 does not react with oils. Hydrogen gas is the only one that chemically transforms liquid oil into solid fat.

Step 4: Conclusion

Therefore, Hydrogen gas is essential for the production of Vanaspati Ghee.

Final Answer: (C)

Quick Tip: Hydrogenation = Addition of Hydrogen + Nickel catalyst + Liquid Oil → Solid Fat.

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19. The shape of CH_4 (Methane) molecule is:

(A) Linear

(B) Tetrahedral

(C) Square planar

(D) Pyramidal

Correct Answer: (B) Tetrahedral

Solution:

Step 1: Concept

The VSEPR (Valence Shell Electron Pair Repulsion) theory determines the geometry of a molecule based on the number of bonding and lone pairs around the central atom.

Step 2: Meaning

In Methane (CH_4), Carbon is the central atom with 4 valence electrons, all of which are bonded

to Hydrogen atoms.

Step 3: Analysis

There are 4 bond pairs and 0 lone pairs (sp^3 hybridization). To minimize repulsion, these four pairs arrange themselves at the corners of a regular tetrahedron with bond angles of 109.5°.

Step 4: Conclusion

The resulting geometric shape is tetrahedral.

Final Answer: (B)

Quick Tip: 4 Bond Pairs + 0 Lone Pairs always results in a Tetrahedral shape.

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20. Which of the following is an amphoteric oxide?

(A) Na_2O

(B) SO_2

(C) Al_2O_3

(D) CaO

Correct Answer: (C) Al_2O_3

Solution:

Step 1: Concept

Oxides are classified as acidic, basic, neutral, or amphoteric based on their reaction with acids and bases.

Step 2: Meaning

An amphoteric oxide is one that shows both acidic and basic properties, meaning it can react with both acids and strong bases to form salt and water.

Step 3: Analysis

Na_2O and CaO are basic (metallic) oxides. SO_2 is an acidic (non-metallic) oxide. Al_2O_3 (Alumina) reacts with HCl (acting as a base) and with $NaOH$ (acting as an acid).

Step 4: Conclusion

Because Aluminum Oxide exhibits dual behavior, it is the correct amphoteric example.

Final Answer: (C)

Quick Tip: Common amphoteric oxides: Al_2O_3, ZnO, PbO, and SnO.
