

TS EAMCET 2026 May 5 Shift 1

Question Paper with Solutions (Memory-Based)

Conducted by JNTU, Hyderabad



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 of the following is a non-reducing sugar?

- (A) Glucose
- (B) Fructose
- (C) Maltose
- (D) Sucrose

Correct Answer: (D) Sucrose

Solution:

Step 1: Concept

Reducing sugars are carbohydrates that possess a free aldehyde or ketone group, allowing them to act as reducing agents in chemical reactions like Fehling's or Benedict's tests.

Step 2: Meaning

In a non-reducing sugar, the functional groups (anomeric carbons) are involved in a glycosidic bond and are not free to open into a chain form to reduce other substances.

Step 3: Analysis

Glucose and Fructose are monosaccharides with free functional groups. Maltose is a disaccharide where one anomeric carbon is free. In Sucrose, the glycosidic bond is formed between the anomeric carbon of glucose and the anomeric carbon of fructose, locking both functional groups.

Step 4: Conclusion

Since Sucrose lacks a free aldehyde or ketone group, it cannot reduce metallic ions and is classified as a non-reducing sugar.

Final Answer: (D)

Quick Tip: Most monosaccharides and disaccharides are reducing; Sucrose is the primary exception you need to remember.

2. Double fertilisation is a characteristic feature of:

- (A) Gymnosperms
- (B) Algae
- (C) Angiosperms
- (D) Pteridophytes

Correct Answer: (C) Angiosperms

Solution:

Step 1: Concept

Double fertilization is a complex fertilization mechanism involving the joining of a female gametophyte with two male gametes.

Step 2: Meaning

One male gamete fertilizes the egg cell to form a zygote (syngamy), while the other fuses with two polar nuclei to form the triploid primary endosperm nucleus (triple fusion).

Step 3: Analysis

Algae and Pteridophytes have simpler fertilization processes. Gymnosperms have single fertil-

ization. This unique "double" event is exclusive to flowering plants.

Step 4: Conclusion

Therefore, double fertilization is the defining characteristic feature of Angiosperms.

Final Answer: (C)

Quick Tip: Double fertilization = Syngamy + Triple Fusion. This only happens in flowering plants (Angiosperms).

3. The Kranz anatomy is associated with which type of photosynthesis?

- (A) C_3 pathway
- (B) C_4 pathway
- (C) CAM pathway
- (D) Both C_3 and CAM

Correct Answer: (B) C_4 pathway

Solution:

Step 1: Concept

Kranz anatomy is a specialized leaf structure where mesophyll cells are clustered around bundle-sheath cells in a wreath-like fashion.

Step 2: Meaning

This anatomical arrangement allows for the spatial separation of carbon fixation and the Calvin cycle, which minimizes photorespiration.

Step 3: Analysis

C_3 plants lack this specialized structure. CAM plants separate processes by time, not space. C_4 plants utilize Kranz anatomy to efficiently fix CO_2 even under high temperature and light intensity.

Step 4: Conclusion

Thus, Kranz anatomy is the structural hallmark of plants following the C_4 photosynthetic pathway.

Final Answer: (B)

Quick Tip: "Kranz" is German for "wreath." Look for this wreath-like cell arrangement in C_4 plants like maize and sugarcane.

4. Which plant hormone promotes fruit ripening?

- (A) Auxin
- (B) Gibberellin
- (C) Cytokinin
- (D) Ethylene

Correct Answer: (D) Ethylene

Solution:

Step 1: Concept

Plant hormones (phytohormones) are signal molecules that regulate various aspects of plant growth and development.

Step 2: Meaning

Fruit ripening involves a series of physiological changes such as softening, sweetening, and color changes, often triggered by gaseous signals.

Step 3: Analysis

Auxins, Gibberellins, and Cytokinins are primarily associated with growth and cell division. Ethylene is a gaseous hormone specifically known for inducing ripening and senescence.

Step 4: Conclusion

Ethylene is the primary hormone responsible for the ripening process in climacteric fruits.

Final Answer: (D)

Quick Tip: Ethylene is the only gaseous plant hormone. Think of it as the "ripening gas."

5. Vernalisation refers to:

- (A) Dormancy in seeds
- (B) Flowering induced by cold temperature
- (C) Leaf fall in autumn
- (D) Stem elongation

Correct Answer: (B) Flowering induced by cold temperature

Solution:

Step 1: Concept

Vernalisation is the induction of a plant's flowering process by exposure to the prolonged cold of winter, or an artificial equivalent.

Step 2: Meaning

It ensures that reproductive development and seed production occur in the favorable spring and summer rather than the cold winter.

Step 3: Analysis

Seed dormancy is a state of suspended growth. Leaf fall is abscission. Stem elongation is often regulated by gibberellins. Vernalisation specifically links low temperatures to the transition to flowering.

Step 4: Conclusion

Therefore, the term refers to the qualitative or quantitative dependence of plants on low temperature to initiate flowering.

Final Answer: (B)

Quick Tip: Vernal = Spring. Vernalisation is the process of "making a plant ready for spring" through a cold treatment.

6. Synaptic vesicles in neurons contain:

- (A) Hormones
- (B) Neurotransmitters
- (C) Enzymes
- (D) DNA

Correct Answer: (B) Neurotransmitters

Solution:

Step 1: Concept

Neurons communicate across synapses using chemical signals stored in specialized membrane-bound structures.

Step 2: Meaning

Synaptic vesicles are small, electron-lucent spheres found in the presynaptic terminals of neurons.

Step 3: Analysis

Hormones are typically released into the bloodstream by endocrine glands. Enzymes catalyze reactions but are not the primary signaling molecules stored for release in synapses. DNA is stored in the nucleus. Neurotransmitters are the specific chemicals stored in these vesicles to be released into the synaptic cleft.

Step 4: Conclusion

Therefore, synaptic vesicles are the storage sites for neurotransmitters, ensuring their rapid release upon stimulation.

Final Answer: (B)

Quick Tip: Think of "Synaptic" as the "Signal" junction and "Vesicles" as "Vehicles" carrying Neurotransmitters.

7. The kidney's functional unit is the:

- (A) Nephron
- (B) Pyramid
- (C) Cortex
- (D) Pelvis

Correct Answer: (A) Nephron

Solution:

Step 1: Concept

A functional unit is the smallest part of an organ that can perform all the functions of that organ.

Step 2: Meaning

The kidney is responsible for filtering blood, reabsorbing nutrients, and excreting waste as urine.

Step 3: Analysis

The cortex is the outer layer of the kidney, and the pelvis is the funnel-like dilated part of the ureter. Pyramids are structural sections of the medulla. The nephron is the microscopic structure that actually performs the filtration and urine formation.

Step 4: Conclusion

Since each kidney contains about one million nephrons that independently process blood, the nephron is the true functional unit.

Final Answer: (A)

Quick Tip: Kidney starts with "K", but its unit is the Nephron (starts with "N").

8. Which part of the brain controls body temperature?

- (A) Cerebellum
- (B) Medulla oblongata
- (C) Hypothalamus
- (D) Thalamus

Correct Answer: (C) Hypothalamus

Solution:

Step 1: Concept

Homeostasis is the maintenance of a constant internal environment, and the brain has a specific "thermostat" center.

Step 2: Meaning

This region monitors blood temperature and receives sensory input from the skin to initiate cooling or warming responses.

Step 3: Analysis

The cerebellum coordinates movement. The medulla oblongata controls heart rate and breathing. The thalamus acts as a sensory relay station. The hypothalamus contains the thermoregulatory center.

Step 4: Conclusion

By coordinating physiological responses like sweating or shivering, the hypothalamus maintains the body's set-point temperature.

Final Answer: (C)

Quick Tip: Hypothalamus = "Homeostasis" and "Heat" control.

9. Which of the following is an autosomal recessive disorder?

- (A) Haemophilia
- (B) Turner syndrome
- (C) Phenylketonuria (PKU)
- (D) Down syndrome

Correct Answer: (C) Phenylketonuria (PKU)

Solution:

Step 1: Concept

Autosomal recessive disorders occur when an individual inherits two copies of a mutated gene located on a non-sex chromosome (autosome).

Step 2: Meaning

This means both parents must be carriers for a child to manifest the disease.

Step 3: Analysis

Haemophilia is an X-linked recessive disorder. Turner syndrome (XO) and Down syndrome (Trisomy 21) are chromosomal abnormalities caused by non-disjunction. Phenylketonuria is a Mendelian disorder caused by a mutation in the PAH gene on chromosome 12.

Step 4: Conclusion

Because the PAH gene is on an autosome and requires two recessive alleles to show the phenotype, PKU fits the definition.

Final Answer: (C)

Quick Tip: PKU is an "Autosomal" error in metabolism, while Haemophilia is "Sex-linked".

10. The 'golden age of reptiles' is associated with which era?

- (A) Cenozoic
- (B) Mesozoic
- (C) Palaeozoic
- (D) Proterozoic

Correct Answer: (B) Mesozoic

Solution:**Step 1: Concept**

Earth's history is divided into geological eras based on the dominant life forms present during those times.

Step 2: Meaning

An "age" refers to the period when a specific group of organisms reached its maximum diversity and dominance.

Step 3: Analysis

The Palaeozoic era is the age of invertebrates and amphibians. The Cenozoic era is the age of mammals. The Mesozoic era (comprising Triassic, Jurassic, and Cretaceous periods) was dominated by dinosaurs and diverse reptiles.

Step 4: Conclusion

The Mesozoic Era is universally recognized as the 'Golden Age of Reptiles' due to their planetary dominance across land, sea, and air.

Final Answer: (B)

Quick Tip: Mesozoic = Middle life = Middle of the "Big Three" eras (Palaeozoic, Mesozoic, Cenozoic)
= Dinosaurs/Reptiles.

11. In Young's double slit — if slit separation is halved and screen distance doubled, fringe width becomes:

- (A) Halved
- (B) Doubled
- (C) 4 times
- (D) Unchanged

Correct Answer: (C) 4 times

Solution:

Step 1: Concept

The fringe width (β) in Young's Double Slit Experiment is given by the formula $\beta = \frac{\lambda D}{d}$, where λ is the wavelength, D is the distance to the screen, and d is the slit separation.

Step 2: Meaning

Halving the slit separation means the new separation $d' = \frac{d}{2}$. Doubling the screen distance means the new distance $D' = 2D$.

Step 3: Analysis

Substituting the new values into the fringe width formula: $\beta' = \frac{\lambda(2D)}{(d/2)} = 4 \times \frac{\lambda D}{d}$.

Step 4: Conclusion

The calculation shows that the new fringe width β' is exactly 4 times the original fringe width β .

Final Answer: (C)

Quick Tip: Fringe width is directly proportional to screen distance and inversely proportional to slit separation.

12. The SI unit of self-inductance is:

- (A) Farad
- (B) Tesla
- (C) Henry
- (D) Weber

Correct Answer: (C) Henry

Solution:

Step 1: Concept

Self-inductance is the property of a circuit where a change in current induces an electromotive force (EMF) in the same circuit.

Step 2: Meaning

It represents the ratio of the magnetic flux linkage to the current flowing through the inductor.

Step 3: Analysis

Looking at the options: Farad is for capacitance, Tesla for magnetic field strength, and Weber for magnetic flux. Henry is specifically defined for inductance.

Step 4: Conclusion

Thus, the standard International System (SI) unit for measuring self-inductance is the Henry.

Final Answer: (C)

Quick Tip: Remember: Henry for Inductance, Farad for Capacitance.

13. Which quantum number determines the shape of an orbital?

- (A) Principal quantum number (n)
- (B) Azimuthal quantum number (l)
- (C) Magnetic quantum number (m)
- (D) Spin quantum number (s)

Correct Answer: (B) Azimuthal quantum number (l)

Solution:

Step 1: Concept

Quantum numbers describe the properties of atomic orbitals and the electrons within them.

Step 2: Meaning

Each quantum number has a specific role: n defines size/energy, l defines shape, m defines orientation, and s defines spin.

Step 3: Analysis

The azimuthal (or angular momentum) quantum number (l) relates to the subshell (s, p, d, f), which dictates the geometric shape of the electron cloud.

Step 4: Conclusion

Therefore, the azimuthal quantum number is the one that determines whether an orbital is spherical, dumbbell-shaped, etc.

Final Answer: (B)

Quick Tip: "l" for "Layout" or "Look" helps remember it defines the shape of the orbital.

14. In photoelectric effect, the stopping potential depends on:

- (A) Intensity of light
- (B) Frequency of incident light
- (C) Work function only
- (D) Both frequency and work function

Correct Answer: (D) Both frequency and work function

Solution:

Step 1: Concept

Einstein's photoelectric equation is $eV_0 = h\nu - \Phi$, where V_0 is the stopping potential, ν is the frequency, and Φ is the work function.

Step 2: Meaning

Stopping potential is the negative potential required to stop the fastest-moving photoelectrons.

Step 3: Analysis

The equation shows V_0 is a function of the incident frequency (ν) and the material's specific work function (Φ). It does not depend on the intensity of light.

Step 4: Conclusion

Consequently, the stopping potential is determined by both the energy of the incoming photons and the energy barrier of the metal surface.

Final Answer: (D)

Quick Tip: Remember the formula: $eV_0 = h\nu - W$. It clearly shows dependence on both terms.

15. Angle of minimum deviation for a prism — the ray inside the prism:

- (A) Passes parallel to the base from outside
- (B) Refracts at only one surface
- (C) Travels parallel to the base inside
- (D) Undergoes total internal reflection

Correct Answer: (C) Travels parallel to the base inside

Solution:

Step 1: Concept

In a prism, the angle of deviation is the angle between the incident ray and the emergent ray.

Step 2: Meaning

Minimum deviation (D_m) is a specific state of symmetry where the light ray is bent the least amount possible by the prism.

Step 3: Analysis

At this condition of minimum deviation, the angle of incidence equals the angle of emergence ($i = e$). For an equilateral or isosceles prism, this symmetry forces the internal refracted ray to be parallel to the base.

Step 4: Conclusion

Therefore, at the point of minimum deviation, the ray inside the prism travels parallel to its

base.

Final Answer: (C)

Quick Tip: Minimum deviation = Maximum symmetry. Symmetry means the internal ray is parallel to the base.

16. $KMnO_4$ is a:

- (A) Primary standard
- (B) Secondary standard
- (C) Neither
- (D) Reducing agent in acidic medium

Correct Answer: (B) Secondary standard

Solution:

Step 1: Concept

Standards in analytical chemistry are substances with a known purity used to determine the concentration of other solutions.

Step 2: Meaning

A primary standard is highly pure and stable, while a secondary standard is a substance whose concentration is determined by titration against a primary standard because it is not available in a completely pure or stable form.

Step 3: Analysis

Potassium permanganate ($KMnO_4$) is difficult to obtain in a perfectly pure state and can be decomposed by light and organic matter. Therefore, its solution must be standardized against a primary standard like oxalic acid.

Step 4: Conclusion

Because of its instability and the requirement for standardization, $KMnO_4$ is classified as a secondary standard.

Final Answer: (B)

Quick Tip: Potassium Permanganate ($KMnO_4$) is a powerful oxidizer but a "Secondary" standard because it decomposes easily.

17. Raoult's law: vapour pressure of a solution is:

- (A) Equal to vapour pressure of pure solvent
- (B) Proportional to mole fraction of solvent
- (C) Independent of temperature
- (D) Proportional to mole fraction of solute

Correct Answer: (B) Proportional to mole fraction of solvent

Solution:

Step 1: Concept

Raoult's law states that the partial vapour pressure of each volatile component in an ideal solution is directly proportional to its mole fraction.

Step 2: Meaning

For a solution containing a non-volatile solute, the vapour pressure of the solution is determined solely by the solvent molecules at the surface.

Step 3: Analysis

Mathematically, $P_{solution} = P_{solvent}^{\circ} \times \chi_{solvent}$, where P° is the vapour pressure of the pure solvent and χ is the mole fraction.

Step 4: Conclusion

The equation shows that the vapour pressure of the solution is directly proportional to the mole fraction of the solvent.

Final Answer: (B)

Quick Tip: More solvent = More vapour. Vapour pressure depends on the "Solvent" mole fraction.

18. The rate-determining step in a reaction mechanism is the:

- (A) Fastest step
- (B) Slowest step

- (C) Last step
(D) First step always

Correct Answer: (B) Slowest step

Solution:

Step 1: Concept

Complex chemical reactions often occur through a series of elementary steps known as the reaction mechanism.

Step 2: Meaning

The rate-determining step (RDS) is the specific stage in the mechanism that governs the overall speed of the chemical reaction.

Step 3: Analysis

Similar to a bottleneck in a pipe, the entire process cannot proceed faster than its most time-consuming part. The fastest steps must wait for the slower ones to complete.

Step 4: Conclusion

Therefore, the slowest step in any reaction mechanism is the rate-determining step.

Final Answer: (B)

Quick Tip: Think of a relay race: the overall time is mostly determined by the slowest runner.

19. Aspirin is synthesised from:

- (A) Salicylic acid + Acetic anhydride
(B) Phenol + HNO_3
(C) Benzene + Cl_2
(D) Toluene + $KMnO_4$

Correct Answer: (A) Salicylic acid + Acetic anhydride

Solution:

Step 1: Concept

Aspirin (acetylsalicylic acid) is produced through an acetylation reaction, which is an esterification process.

Step 2: Meaning

The hydroxyl group ($-OH$) of salicylic acid is replaced by an acetyl group ($-COCH_3$).

Step 3: Analysis

When salicylic acid reacts with acetic anhydride in the presence of an acid catalyst, the acetyl group from the anhydride attaches to the oxygen of the salicylic acid.

Step 4: Conclusion

The reaction between salicylic acid and acetic anhydride yields aspirin and acetic acid as a byproduct.

Final Answer: (A)

Quick Tip: Aspirin = Acetyl + Salicylic Acid. You need an acetylating agent like Acetic Anhydride.

20. The Nernst equation relates the EMF of a cell to:

- (A) Temperature only
- (B) Concentration of ions and temperature
- (C) Pressure only
- (D) Standard potential only

Correct Answer: (B) Concentration of ions and temperature

Solution:

Step 1: Concept

The Nernst equation allows for the calculation of cell potential under non-standard conditions.

Step 2: Meaning

The equation is expressed as $E = E^\circ - \frac{RT}{nF} \ln Q$.

Step 3: Analysis

In the formula, T represents temperature and Q is the reaction quotient, which depends on the concentrations (or pressures) of the ions and molecules involved.

Step 4: Conclusion

Thus, the Nernst equation specifically relates the Electromotive Force (EMF) to the temperature and the concentration of the reactants and products.

Final Answer: (B)

Quick Tip: $E = E^\circ - (\text{constant} \times T) \log(\text{Concentration})$. It links potential to both variables.