

CUET 2026 May 22 Chemistry Shift 1

Question Paper (Memory-Based)

Conducted by National Testing Agency (NTA)



General Instructions

- (i) The examination will be conducted in Computer-Based Test (CBT) mode.
- (ii) Each question carries +5 marks for a correct answer and -1 mark for a wrong answer.
- (iii) The total number of questions is 50.
- (iv) Duration of the examination is 1 hour (60 minutes).

1. A first-order reaction has a specific rate constant (k) equal to $2.303 \times 10^{-3} \text{ s}^{-1}$. Calculate the exact time required for the initial concentration of the reactant to be reduced to exactly $\frac{1}{10}$ th of its original value.

- (A) 100 s
- (B) 2303 s
- (C) 1000 s
- (D) 693 s

2. Which of the following carbonyl compounds will undergo a self-oxidation and self-reduction reaction (Cannizzaro Reaction) when treated with a concentrated solution of a strong base (NaOH)?

- (A) Acetaldehyde (CH_3CHO)
- (B) Benzaldehyde ($\text{C}_6\text{H}_5\text{CHO}$)
- (C) Acetone (CH_3COCH_3)
- (D) Propanal ($\text{CH}_3\text{CH}_2\text{CHO}$)

3. Determine the spin-only magnetic moment value for a central divalent manganese gaseous ion (Mn^{2+}) based on its d-orbital electron distribution. (Atomic Number of Mn = 25)

- (A) 4.90 BM
 - (B) 1.73 BM
 - (C) 3.87 BM
 - (D) 5.92 BM
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4. An organic amine compound 'X' reacts smoothly with Hinsberg's reagent (Benzenesulfonyl chloride) to form a solid precipitate. This precipitate remains completely insoluble when treated with an aqueous sodium hydroxide (NaOH) solution. Classify the amine 'X'.

- (A) Primary Amine
 - (B) Secondary Amine
 - (C) Tertiary Amine
 - (D) Quaternary Ammonium Salt
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5. According to IUPAC coordination nomenclature rules, what is the correct official name for the coordination compound represented by $[\text{Co}(\text{NH}_3)_5(\text{Cl})]\text{Cl}_2$?

- (A) Chloridopentaamminecobaltic chloride
 - (B) Pentaaminechloridocobalt(II) dichloride
 - (C) Pentaaminechloridocobalt(III) chloride
 - (D) Pentaamminedichloridocobalt(III) chloride
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6. Which of the following statement options accurately describes the structural carbohydrate linkages present inside a standard molecule of Sucrose?

- (A) It contains a standard C-1 to C-4 glycosidic bridge linking two identical α -D-glucose rings together.
 - (B) It features a glycosidic linkage connecting the C-1 carbon of an α -D-glucose unit to the C-2 carbon of a β -D-fructose unit.
 - (C) It consists of a C-1 to C-4 linkage binding a β -D-galactose ring directly onto a neighboring glucose molecule.
 - (D) It is formed by a continuous chain of β -D-glucose blocks linked entirely via C-1 to C-6 branch channels.
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7. What is the correct official unit measurement scale used to represent Molar Conductivity

(Λ_m) profiles within electrolytic systems?

- (A) $\text{S cm}^{-2} \text{ mol}^{-1}$
 - (B) $\text{S}^{-1} \text{ cm}^2 \text{ mol}$
 - (C) $\Omega \text{ cm}^2 \text{ mol}^{-1}$
 - (D) $\text{S cm}^2 \text{ mol}^{-1}$
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8. The steady, progressive decrease in the atomic and ionic radii of transition metals along the lanthanide series (Lanthanide Contraction) is primarily caused by:

- (A) A continuous decrease in the absolute nuclear proton count within the central atomic cores.
 - (B) The exceptionally poor shielding effect of the diffuse $4f$ -electrons, which allows the increasing nuclear charge to pull the outer electron shell inward.
 - (C) The strong shielding ability of the $5d$ -electrons completely blocking the nuclear pull.
 - (D) A sudden jump in the principal quantum number of the outer valence shells.
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9. Identify which of the following heterocyclic nitrogenous bases is found exclusively within the macromolecular structure of RNA, and is completely absent in standard double-stranded DNA structures.

- (A) Thymine
 - (B) Adenine
 - (C) Uracil
 - (D) Cytosine
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10. During an electrochemistry lab session, a student uses the Nernst Equation to calculate the cell potential (E_{cell}) of a galvanic system at a non-standard temperature. Which parameter option accurately defines the scaling behavior of the cell potential relative to changes in the reaction quotient (Q)?

- (A) As the concentration of product ions increases relative to reactant ions (increasing Q), the value of E_{cell} decreases.
 - (B) The value of E_{cell} increases linearly with an increase in the value of Q .
 - (C) The value of E_{cell} remains completely independent of any concentration shifts in Q .
 - (D) An increase in Q causes an exponential jump in the net electrical voltage produced.
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