



CUET 2026 May 22 Chemistry Shift 2

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. Which of the following liquid mixtures forms an ideal solution that strictly obeys Raoult's Law across the entire concentration range at a constant temperature?

- (A) Ethanol + Acetone
- (B) Chloroform + Acetone
- (C) n-Hexane + n-Heptane
- (D) Water + Nitric acid

2. Aldehydes and ketones react with semicarbazide ($\text{NH}_2\text{NHCONH}_2$) in a weakly acidic medium to form crystalline semicarbazone derivatives. Which of the three nitrogen atoms in a semicarbazide molecule acts as the primary nucleophilic center during this reaction?

- (A) The nitrogen atom attached directly to the carbonyl carbon atom ($-\text{NH}-\text{C}=\text{O}$).
- (B) The amide nitrogen atom of the terminal primary amide group ($-\text{CONH}_2$).
- (C) The terminal hydrazine nitrogen atom linked to the adjacent secondary nitrogen ($-\text{NH}_2$ of the $-\text{NH}-\text{NH}_2$ group).
- (D) All three nitrogen atoms are equally nucleophilic due to resonance stabilization.

3. An organic primary amide is treated with bromine (Br_2) and an aqueous solution of sodium hydroxide (NaOH) to yield a primary amine. Which of the following statements correctly

describes this transformation (Hofmann Bromamide Degradation)?

- (A) The resulting primary amine contains one more carbon atom than the starting amide.
 - (B) The resulting primary amine contains the exact same number of carbon atoms as the starting amide.
 - (C) The resulting primary amine contains one less carbon atom than the starting amide due to the loss of the carbonyl group as a carbonate ion.
 - (D) The reaction converts a secondary amide into a tertiary amine via a molecular rearrangement.
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4. Which of the following coordination complex compounds is officially classified as a 'Heteroleptic Complex'?

- (A) $[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_3$
 - (B) $[\text{Co}(\text{NH}_3)_5(\text{Cl})]\text{Cl}_2$
 - (C) $\text{K}_4[\text{Fe}(\text{CN})_6]$
 - (D) $[\text{Ni}(\text{CO})_4]$
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5. What are the exact constituent monosaccharide units and the specific structural glycosidic linkage present inside a standard molecule of Lactose (Milk Sugar)?

- (A) α -D-Glucose and β -D-Fructose linked via a $\text{C}_1 - \text{C}_2$ glycosidic bond.
 - (B) Two units of α -D-Glucose linked via a $\text{C}_1 - \text{C}_4$ glycosidic bond.
 - (C) β -D-Galactose and β -D-Glucose linked via a $\text{C}_1 - \text{C}_4$ glycosidic bond.
 - (D) Two units of β -D-Glucose linked via a $\text{C}_1 - \text{C}_6$ glycosidic bond.
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6. When an aqueous solution of an electrolyte is progressively diluted by adding more solvent water, how do its Specific Conductivity (κ) and Molar Conductivity (Λ_m) respond?

- (A) Both Specific Conductivity (κ) and Molar Conductivity (Λ_m) increase uniformly.
 - (B) Both Specific Conductivity (κ) and Molar Conductivity (Λ_m) decrease uniformly.
 - (C) Specific Conductivity (κ) increases, while Molar Conductivity (Λ_m) decreases.
 - (D) Specific Conductivity (κ) decreases, while Molar Conductivity (Λ_m) increases.
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7. Benzene reacts with a mixture of carbon monoxide (CO) and hydrogen chloride (HCl) gas in the presence of an anhydrous aluminium chloride (AlCl_3) catalyst to yield Benzaldehyde. This organic transformation is officially known as the:

- (A) Rosenmund Reduction
 - (B) Gattermann-Koch Reaction
 - (C) Etard Reaction
 - (D) Stephen Reaction
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8. Which of the following oxidation state configurations represents the most common, energetically stable, and dominant oxidation state exhibited by nearly all the Lanthanoid elements across the f-block series?

- (A) +2
 - (B) +4
 - (C) +3
 - (D) +5
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9. According to the structural constraints of Valence Bond Theory (VBT), which of the following hybridization geometries and magnetic configurations accurately describes the low-spin coordination complex ion $[\text{Fe}(\text{CN})_6]^{4-}$? (Atomic Number of Fe = 26)

- (A) sp^3d^2 hybridization and Paramagnetic
 - (B) d^2sp^3 hybridization and Diamagnetic
 - (C) dsp^2 hybridization and Diamagnetic
 - (D) sp^3d^2 hybridization and Diamagnetic
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10. Deficiency of which of the following essential vitamins in the human diet causes a reduction in intestinal calcium absorption, leading to the bone-softening childhood skeletal deformity known as Rickets?

- (A) Vitamin A
 - (B) Vitamin C
 - (C) Vitamin K
 - (D) Vitamin D
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