CUET 2026 June 6 Shift 1 Chemistry

Question Paper

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 correct answer and -1 mark for wrong answer.

(iii) The total number of questions are 50.

(iv) Duration of the exam is 1 hour (60 minutes).

1. For the following reaction choose the incorrect expression of rate of reaction.

$$5\ Br^{-}(aq.) + BrO_3^{-}(aq.) + 6\ H^{+}(aq.) \rightarrow 3\ Br_2(aq.) + 3\ H_2O(l)$$

(A) Rate $= -\frac{1}{5}\frac{\Delta[Br^{-}]}{\Delta t}$

(B) Rate $= -\frac{1}{6}\frac{\Delta[H^{+}]}{\Delta t}$

(C) Rate $= -\frac{1}{3}\frac{\Delta[Br_2]}{\Delta t}$

(D) Rate $= -\frac{\Delta[BrO_3^{-}]}{\Delta t}$

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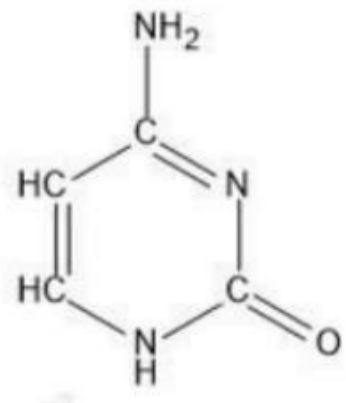
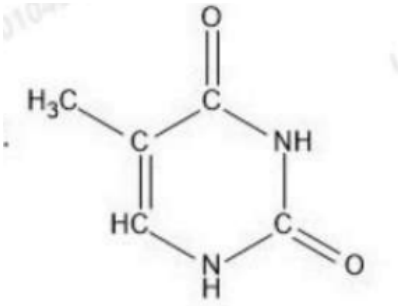
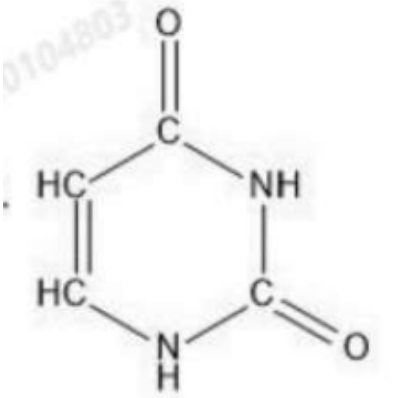
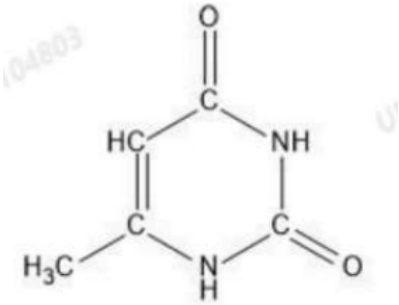
2. What would be the correct structure of thymine base?









(A) figA

(B) figB

(C) figC

(D) figD

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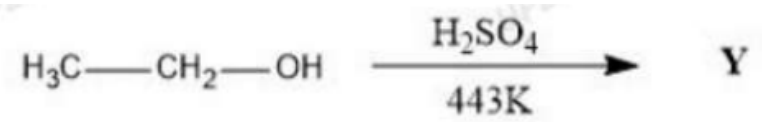
3. What is the product Y in the following chemical reaction?



(A) $C_2H_5OCH_3$

(B) $C_2H_5OC_2H_5$

(C) CH_3OCH_3

(D) $H_2C = CH_2$

4. The order of a reaction whose rate constant $k = 0.693 \times 10^{-6}\,\mathbf{L\ mol^{-1}s^{-1}}$ is:

(A) 0

(B) 2

(C) 1

(D) 3

---

5. Choose the Incorrect option regarding valence bond theory of coordination compound.

(A) It does not give a quantitative interpretation of the thermodynamic stabilities of coordination compounds.

(B) It does not explain the colour exhibited by coordination compounds.

(C) It does not give quantitative interpretation of magnetic data.

(D) It does not distinguish between outer orbital and inner orbital complexes.

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6. Limiting molar conductivities for some ions in water at $298\,K$ are given below:

$$\lambda^\circ_m(H^+) = 349.6, \quad \lambda^\circ_m(Na^+) = 50.1, \quad \lambda^\circ_m(Ca^{2+}) = 119.0,$$

$$\lambda^\circ_m(Mg^{2+}) = 106.0, \quad \lambda^\circ_m(Cl^-) = 76.3, \quad \lambda^\circ_m(SO_4^{2-}) = 160.0$$

Choose the correct decreasing order of molar conductivity (Λ°_m) for $NaCl$, HCl, $CaCl_2$ and $MgSO_4$.

(A) $HCl > CaCl_2 > MgSO_4 > NaCl$

(B) $HCl > CaCl_2 > NaCl > MgSO_4$

(C) $NaCl > CaCl_2 > MgSO_4 > HCl$

(D) $NaCl > HCl > CaCl_2 > MgSO_4$

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7. Arrange the compounds in order of their increasing boiling points.

(A) 1-bromoethane

(B) 1-bromobutane

(C) 2-bromo-2-methylpropane

(D) 2-bromobutane

(A) (A), (C), (D), (B)

(B) (A), (D), (C), (B)

(C) (C), (D), (A), (B)

(D) (C), (A), (D), (B)

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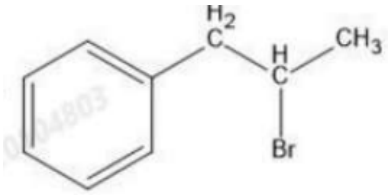
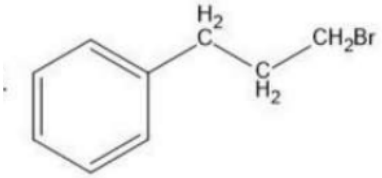
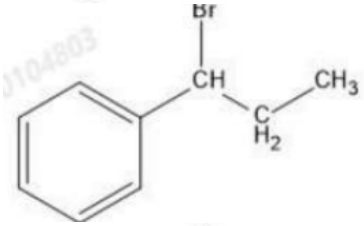
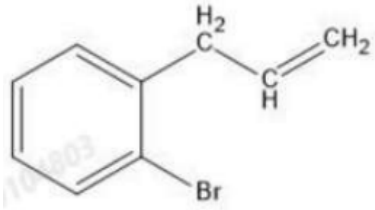
8. Write the major product A in the following chemical reaction.









(A) figA

(B) figB

(C) figC

(D) figD

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9. The complex $[Co(NH_3)_6]^{3+}$ is:

(A) sp^3d^2 hybridised and paramagnetic

(B) sp^3d^2 hybridised and diamagnetic

(C) d^2sp^3 hybridised and paramagnetic

(D) d^2sp^3 hybridised and diamagnetic

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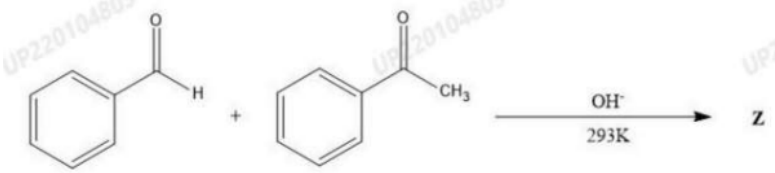
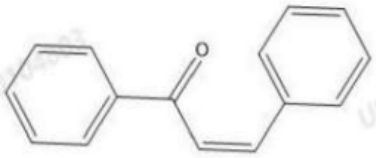
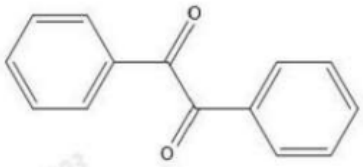
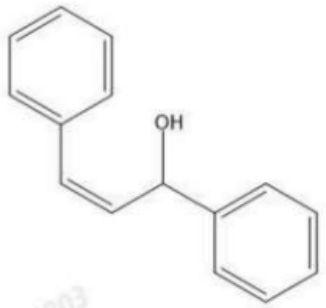
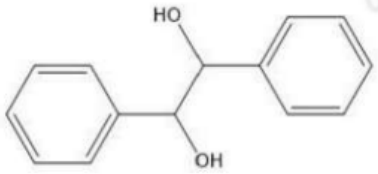
10. The major product Z in the following chemical reaction is:











(A) figA

(B) figB

(C) figC

(D) figD

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11. Arrange the following $3d$-series elements in decreasing order of their second ionisation enthalpy:

(A) Ti ($Z = 22$)

(B) V ($Z = 23$)

(C) Cr ($Z = 24$)

(D) Mn ($Z = 25$)

(A) (C), (B), (D), (A)

(B) (D), (C), (B), (A)

(C) (D), (B), (C), (A)

(D) (C), (D), (B), (A)

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12. The reagent used in the Stephen reaction is:

(A) $Pd - BaSO_4 + H_2$

(B) $SnCl_2 + HCl$

(C) $AlH(i - Bu)_2 + H_2O$

(D) DIBAL-H $+H_2O$

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13. The following reaction can be best described as:

$$3MnO_4^{2-} + 4H^+ \rightarrow 2MnO_4^- + MnO_2 + 2H_2O$$

(A) Coupling

(B) Disproportionation

(C) Displacement

(D) Oxidative fusion

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14. Match List-I with List-II.

List-I **Quantity**	**List-II** **Units**
(A) Conductivity	(I) ohm
(B) Molar Conductivity	(II) S
(C) Resistance	(III) S cm^{-1}
(D) Conductance	(IV) S cm^2 mol^{-1}

(A) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

(B) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

(C) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

(D) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

---

15. Select the correct statements related to carbohydrates:

(A) Glucose is also known as dextrose.

(B) In glucose, an aldehydic group is present and it gives Schiff's test.

(C) Glycogen is also known as animal starch.

(D) Lactose is a reducing sugar.

(A) (A), (B) and (D) only

(B) (A), (B) and (C) only

(C) (A), (C) and (D) only

(D) (B), (C) and (D) only

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16. Consider the following statements and choose the correct statements:

(A) The bond angle in methanol is slightly higher than the tetrahedral angle.

(B) The reaction of Grignard reagent with methanal produces a secondary alcohol.

(C) The boiling point of ethanol is higher than methoxymethane.

(D) Acetylation of salicylic acid produces Aspirin.

(A) (A) and (D) only

(B) (A) and (B) only

(C) (B) and (C) only

(D) (C) and (D) only

---

17. Arrange the following compounds in increasing order of their acid strength.

(A) Phenol

(B) *m*-Nitrophenol

(C) *p*-Nitrophenol

(D) *p*-Cresol

(A) (A), (D), (B), (C)

(B) (D), (A), (C), (B)

(C) (D), (A), (B), (C)

(D) (D), (B), (A), (C)

18. Which of the following reaction will not result in the formation of C-C bonds?

(A) Wurtz reaction

(B) Friedel-Crafts acylation reaction

(C) Reimer-Tiemann reaction

(D) Cannizzaro reaction

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19. What is the final product X in the following reaction?

$$CH_3CH_2CH_2CHO \xrightarrow[(2)\ H_3O^+]{(1)\ \text{Ammoniacal } AgNO_3} X$$

(A) $CH_3CH_2CH_2CH_2NH_2$

(B) $CH_3CH_2CH_2COOH$

(C) $CH_3CH_2CH_2CH_2NO_2$

(D) $CH_3CH_2CH_2CH_3$

---

20. Match List-I with List-II.

List-I	List-II
(A) Collision Theory	(I) $k = \frac{[R]_0 - [R]}{t}$
(B) Arrhenius Equation	(II) $k = A\ e^{-Ea/RT}$
(C) Rate constant for zero order	(III) $k = \frac{1}{t} \ln \frac{[R]_0}{[R]}$
(D) Rate constant for first order	(IV) $\text{Rate} = PZ_{AB}e^{-E_a/RT}$

(A) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

(B) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

(C) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

(D) (A)-(II), (B)-(IV), (C)-(III), (D)-(I)

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21. IUPAC name of $[Co(NH_3)_4(H_2O)Cl]Cl_2$ is:

(A) Tetraammineaquachloridocobalt(II) chloride

(B) Tetraammineaquachloridocobalt(III) chloride

(C) Tetraammineaquachloridocobalt(I) chloride

(D) Tetraammineaquachloridocobalt(0) chloride

---

22. 75% **of a first-order reaction was completed in** 32 **minutes. How long will it take to undergo** 50% **completion? Given:** $\log 2 = 0.3010$

(A) 8 min

(B) 12 min

(C) 16 min

(D) 24 min

---

23. Standard electrode potentials (M^{n+}/M**) of four metals A, B, C and D are given below:**

(A) -1.2 V

(B) $+0.5$ V

(C) $+1.2$ V

(D) -3.0 V

The correct increasing order for the reducing power of these metals will be:

(A) (D), (A), (C), (B)

(B) (D), (A), (B), (C)

(C) (C), (B), (A), (D)

(D) (B), (C), (A), (D)

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24. Choose the optically inactive amino acid from the following:

(A) Glycine

(B) Alanine

(C) Leucine

(D) Isoleucine

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25. Match Ion given in List I with their Magnetic Moment (Calculated) given in List II.

List I	List II
Ion	Magnetic moment (Calculated)
(A) Sc^{3+}	(I) 3.87
(B) Ti^{3+}	(II) 1.73
(C) V^{2+}	(III) 5.92
(D) Mn^{2+}	(IV) 0

(A) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

(B) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

(C) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

(D) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

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26. What would be the product X in the following chemical reaction?

(A) Salicylic acid

(B) Benzoquinone

(C) Salicylaldehyde

(D) 4-Hydroxybenzoic acid

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27. What are the hydrolysis products of Maltose?

(A) α-D-Glucose + β-D-Fructose

(B) α-D-Glucose + β-D-Glucose

(C) α-D-Glucose + α-D-Glucose

(D) α-D-Galactose + β-D-Glucose

---

28. Select the correct assumptions in Crystal Field Theory (CFT) from the following:

(A) Ligands are treated as point charge or point dipole.

(B) The five d orbitals in an isolated gaseous metal atom are non-degenerate.

(C) Degeneracy of the d orbitals is restored with the approach of ligand towards metal.

(D) Metal-ligand bond is ionic arising purely from electrostatic interactions.

Choose the correct answer from the options given below:

(A) (B) and (C) only

(B) (A) and (D) only

(C) (B), (C) and (D) only

(D) (A), (B) and (D) only

---

29. Choose the symbol of a lanthanoid metal which is well known to exhibit +4 oxidation state.

(A) La

(B) Th

(C) Ce

(D) Cm

---

30. Which of the following compounds does not undergo Cannizzaro reaction?

(A) Formaldehyde

(B) 2,2-Dimethylbutanal

(C) Benzaldehyde

(D) Acetaldehyde

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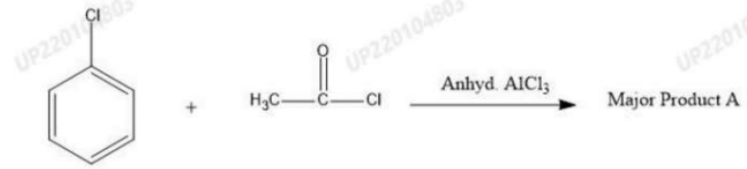
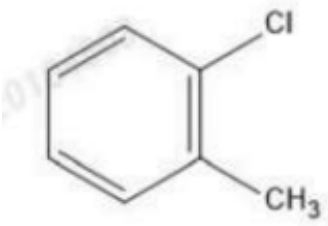
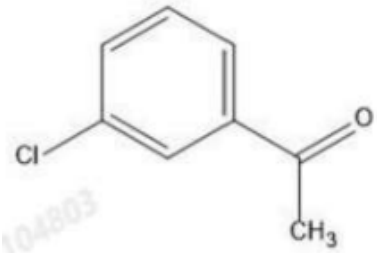
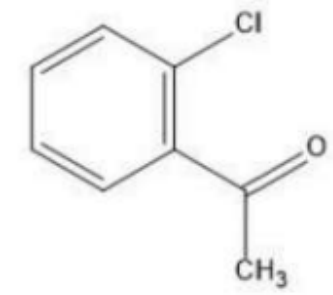
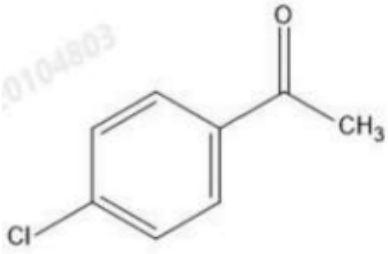
31. What would be the major product A?











(A) figA

(B) figB

(C) figC

(D) figD

---

32. Which of the following statements are incorrect for thermodynamic properties?

(A) Both E_{cell} and $\Delta_r G$ of reaction are extensive properties.

(B) Both E_{cell} and $\Delta_r G$ of reaction are intensive properties.

(C) E_{cell} is an intensive property while $\Delta_r G$ of reaction is an extensive property.

(D) E_{cell} is an extensive property while $\Delta_r G$ of reaction is an intensive property.

Choose the answer from the options given below:

(A) (A), (B) and (D) only

(B) (A), (B) and (C) only

(C) (B), (C) and (D) only

(D) (A), (C) and (D) only

---

33. What would be the geometrical shape of $[NiCl_4]^{2-}$ and $[PtCl_4]^{2-}$ compounds?

(A) Both $[NiCl_4]^{2-}$ and $[PtCl_4]^{2-}$ are square planar.

(B) Both $[NiCl_4]^{2-}$ and $[PtCl_4]^{2-}$ are tetrahedral.

(C) $[NiCl_4]^{2-}$ is square planar while $[PtCl_4]^{2-}$ is tetrahedral.

(D) $[NiCl_4]^{2-}$ is tetrahedral while $[PtCl_4]^{2-}$ is square planar.

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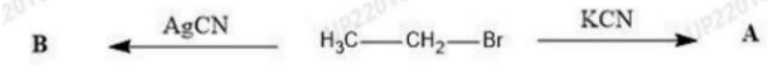
34. The major products A and B formed in the following reaction are:



(A) $A = CH_3CH_2CN$, $B = CH_3CH_2NC$

(B) $A = CH_3CH_2CN$, $B = CH_3CH_2CN$

(C) $A = CH_3CH_2NC$, $B = CH_3CH_2NC$

(D) $A = CH_3CH_2NC$, $B = CH_3CH_2CN$

---

35. Choose the transition element which exhibit least number of variable oxidation states.

(A) Sc

(B) Cr

(C) Mn

(D) Fe

---

36. The standard Gibbs energy for the reaction is $-212.27\,kJ\,mol^{-1}$.

$$Zn(s) + Cu^{2+}(aq.) \rightarrow Zn^{2+}(aq.) + Cu(s)$$

The standard electrode potential (E°_{cell}) for the Daniell cell is:

(A) 1.1 V

(B) 2.2 V

(C) 0.002 V

(D) 0.001 V

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37. Choose the correct statements:

(A) For a gaseous reaction if the concentration of gas is expressed in terms of their partial pressure

atm and time in minutes then unit of rate are atm min^{-1}.

(B) The sum of power of the concentration of the reactants in the rate law expression is called order of that reaction.

(C) The thermal decomposition of HI on gold surface is an example of second order reaction.

(D) The overall rate of the reaction is controlled by the slowest step in a reaction called the rate determining step.

Choose the correct answer from the options given below:

(A) (A) and (B) only

(B) (B) and (C) only

(C) (C) and (D) only

(D) (B) and (D) only

---

38. Match Reaction with Reagent Required:

List-I	List-II
Reaction	**Reagent Required**
(A) Glucose to n-Hexane	(I) NH_2OH
(B) Glucose to Oxime	(II) HNO_3
(C) Glucose to Gluconic Acid	(III) HI, Δ
(D) Glucose to Saccharic Acid	(IV) Br_2, H_2O

Choose the correct answer from the options given below:

(A) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

(B) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

(C) (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

(D) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)

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39. What would be the major product when propene reacts with water in presence of acid catalyst?

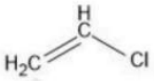
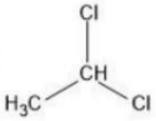
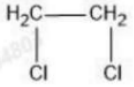
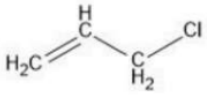
(A) $CH_3CH(OH)CH_3$ (Propan-2-ol)

(B) $CH_3CH_2CH_2OH$ (Propan-1-ol)

(C) $CH_3C(OH)_2CH_3$

(D) $CH_3CH_2CH_2COOH$

40. Match Structure with their Common Name:

List I	List-II
Structure	**Common Name**
(A) 	(I) Allyl chloride
(B) 	(II) Ethylene dichloride
(C) 	(III) Vinyl chloride
(D) 	(IV) Ethylidene chloride

Choose the correct answer from the options given below:

(A) (A)-(I), (B)-(IV), (C)-(II), (D)-(III)

(B) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

(C) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)

(D) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

Passage for Questions 41–45

Read the given passage and answer the questions that follow:

Concept of Solution

There are several ways by which concentration of solution is quantitatively described: molality, molarity, mole fraction, ppm, mass % etc. Liquid–liquid solutions can be classified as ideal and non-ideal solutions on the basis of Raoult's law. Suppose the molecules of two components are represented by A and B respectively. In pure components, the intermolecular attractive interaction will be of types $A—A$ and $B—B$, whereas in the binary solution, $A—B$ type of interactions will also be present. If intermolecular attractive forces between the $A—A$ and $B—B$ are nearly equal to those between $A—B$, ideal solution is formed.

The properties of solution which depend on the number of solute particles irrespective of their nature relative to the total number of particles present in the solution are called colligative properties.

41. What would be the molality of $1.5\,g$ of ethanoic acid (CH_3COOH) in $75\,g$ of benzene?

(A) $0.55\ mol\,kg^{-1}$

(B) $0.33\ mol\,kg^{-1}$

(C) $0.44\ mol\,kg^{-1}$

(D) $0.22\ mol\,kg^{-1}$

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42. Which one of the following is not correct for an ideal solution?

(A) It must obey Raoult's law.

(B) $\Delta_{mix}H = 0$

(C) $\Delta_{mix}V = 0$

(D) $\Delta_{mix}H \neq 0$, and $\Delta_{mix}V = 0$

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43. The vapour pressure of pure benzene at $25^{\circ}C$ is 0.950 bar. When a $0.5\,g$ non-volatile, non-electrolyte solute is added to $39.0\,g$ of benzene (molar mass $78\,g\,mol^{-1}$), then the vapour pressure of solution becomes 0.945 bar. What is the molar mass of the solute?

(A) $170\,g\,mol^{-1}$

(B) $190\,g\,mol^{-1}$

(C) $210\,g\,mol^{-1}$

(D) $180\,g\,mol^{-1}$

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44. The solution of acetone in ethanol:

(A) shows positive deviation from Raoult's law.

(B) shows negative deviation from Raoult's law.

(C) obeys Raoult's law.

(D) shows both negative and positive deviation from Raoult's law.

---

45. Which of the following concentration term is temperature dependent?

(A) Molality

(B) Mole fraction

(C) Molarity

(D) ppm

Passage for Questions 46–50

Read the given passage and answer the questions that follow:

Amines

Amines are important class of organic compounds which are basic in nature. They are generally derived by replacing one or more hydrogen atoms of ammonia molecule by alkyl / aryl group(s). In nature, they are generally found in proteins, vitamins, alkaloids and hormones. Two biologically active compounds namely adrenaline and ephedrine contain secondary amino group and are used to increase blood pressure.

Like ammonia, nitrogen atom of amines is trivalent and carries an unshared pair of electrons. Nitrogen orbitals in amines are therefore, sp^3 hybridized and the geometry of amine is pyramidal. Due to the presence of unshared pair of electrons, the angle C–N–E (where E is C or H) is less than 109.5°.

Inductive effects, solvation effects, steric effects etc. affect the basic strength of amines. Amines are classified as primary (1°), secondary (2°), and tertiary (3°) depending upon the number of hydrogen atoms replaced by alkyl or aryl groups in ammonia molecule. Amines can be prepared from various compounds like reduction of nitro, nitriles, amides etc. compounds. Amines are engaged in intermolecular hydrogen bonding. Aliphatic and aromatic primary amines show positive carbylamine reaction. A colourless crystalline solid benzene diazonium chloride can be obtained from aniline by reacting with sodium nitrite and hydrochloric acid at 273–278 K.

46. Select the correct order of boiling points of isomeric amines:

(A) $n\text{-}C_4H_9NH_2 > (C_2H_5)_2NH > C_2H_5N(CH_3)_2$

(B) $n\text{-}C_4H_9NH_2 < (C_2H_5)_2NH < C_2H_5N(CH_3)_2$

(C) $n\text{-}C_4H_9NH_2 = (C_2H_5)_2NH > C_2H_5N(CH_3)_2$

(D) $n\text{-}C_4H_9NH_2 > (C_2H_5)_2NH = C_2H_5N(CH_3)_2$

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47. Identify the tertiary amine (3°) from the following compounds.

(A) Ethylenediamine

(B) N,N-Dimethylaniline

(C) p-Toluidine

(D) 2,4,6-Tribromoaniline

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48. Identify the correct decreasing order of basic strength of amines in aqueous solution.

(A) $(C_2H_5)_3N > (C_2H_5)_2NH > C_2H_5NH_2 > NH_3$

(B) $C_2H_5NH_2 > (C_2H_5)_3N > (C_2H_5)_2NH > NH_3$

(C) $NH_3 > C_2H_5NH_2 > (C_2H_5)_2NH > (C_2H_5)_3N$

(D) $(C_2H_5)_2NH > (C_2H_5)_3N > C_2H_5NH_2 > NH_3$

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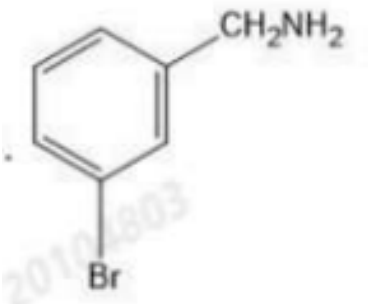
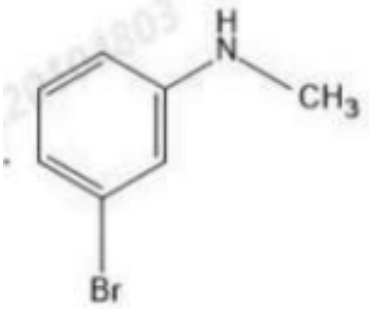
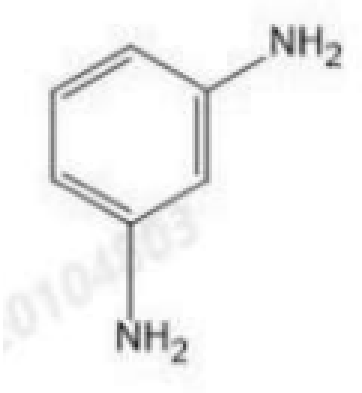
49. The final structure of amine produced by Hoffmann degradation of m-bromobenzamide is:







(A) *m*-Bromobenzylamine

(B) *m*-Bromoaniline

(C) *m*-Bromotoluene derivatives

(D) Aniline

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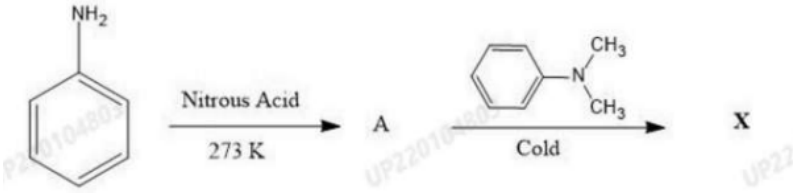
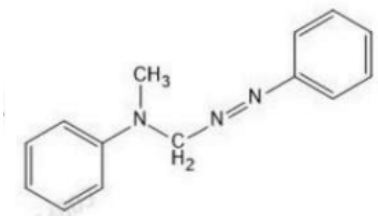
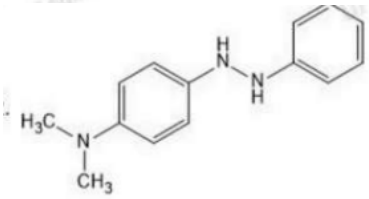
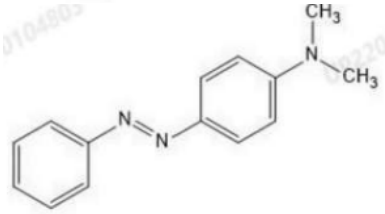
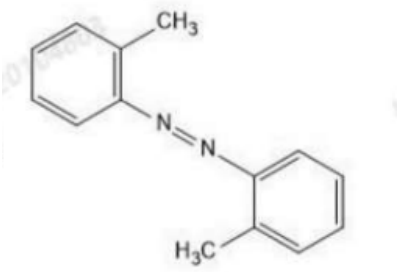
50. What would be the structure of final product X in the following chemical reaction?











(A) figA

(B) figB

(C) figC

(D) figD
