

1 The value of van't Hoff factor  $i$  for  $\text{CH}_3\text{COOH}$  solution in water will be:

1. Between 1 and 2
2. Less than 1
3. 2
4. 1

(C) Binary solution (iii) Solution containing maximum amount of solute

(D) Hypertonic solution (iv) Solutions having same osmotic pressure

Options given.

2 The following solutions were prepared by dissolving 1 g of solute in 1 L of solution. Arrange them in decreasing order of molarity.

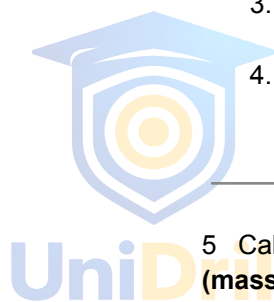
- (A) Glucose ( $M = 180 \text{ g mol}^{-1}$ )  
(B) NaOH ( $M = 40 \text{ g mol}^{-1}$ )  
(C) NaCl ( $M = 58.5 \text{ g mol}^{-1}$ )  
(D) KCl ( $M = 74.5 \text{ g mol}^{-1}$ )

Options:

1. (A), (D), (C), (B)
2. (A), (B), (D), (C)
3. (B), (C), (D), (A)
4. (D), (C), (A), (B)

4 Give reason for low concentration of oxygen in blood and tissues of people living at high altitude.

1. Low temperature and high atmospheric pressure
2. Low temperature
3. Low atmospheric pressure
4. High atmospheric pressure



5 Calculate the molality of KI if density of 20% (mass/mass) aqueous solution =  $1.202 \text{ g mL}^{-1}$  (Molar mass KI =  $166 \text{ g mol}^{-1}$ )

1.  $1.5 \text{ mol kg}^{-1}$
2.  $0.5 \text{ mol kg}^{-1}$
3.  $0.15 \text{ mol kg}^{-1}$
4.  $0.2 \text{ mol kg}^{-1}$

3 Match List-I (Solutions) with List-II (Explanation).

**List-I**                      **List-II**

(A) Saturated solution      (i) Solution having two components

(B) Isotonic solutions      (ii) A solution whose osmotic pressure is more than another

6 The unit of  $E^\circ_{\text{cell}}$  is:

1.  $\text{V m}^{-1}$
2.  $\text{S cm}^{-1}$
3. V
4.  $\text{S cm}^2 \text{ mol}^{-1}$

7 Match **Property with Unit**.

Property	Unit
(A) Cell constant	(i) $\Omega \text{ cm}$
(B) Molar conductance	(ii) $\Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
(C) Specific conductance	(iii) $\Omega^{-1} \text{ cm}^{-1}$
(D) Conductance	(iv) $\Omega^{-1}$

Options given.

 8 The following statements describe properties of a **Mercury cell**.

- (A) Converts energy of combustion into electrical energy
- (B) It is rechargeable
- (C) Reaction:  $\text{Zn} + \text{HgO} \rightarrow \text{ZnO} + \text{Hg}$
- (D) It is a low current device used in hearing aids

Choose correct option.

 9 Which cell is used in **automobiles and inverters**?

1. Mercury cell
2. Dry cell
3. Lead storage cell
4. Fuel cell

10 A galvanic cell behaves as an electrolytic cell when:

1.  $E_{\text{cell}} = E_{\text{ext}}$
2.  $E_{\text{cell}} = 0$
3.  $E_{\text{ext}} > E_{\text{cell}}$
4.  $E_{\text{cell}} > E_{\text{ext}}$

 11 Which of the following **does not represent correct application of coordination compounds**?

1. cis-platin effective in tumours
2. chlorophyll helps in photosynthesis
3. desferrioxamine B used for lead poisoning
4. cyanocobalamin (vitamin  $\text{B}_{12}$ ) is a coordination compound of Co

 12 Arrange the following ions in **increasing order of number of 3d electrons**:

- (A)  $\text{Cr}^{2+}$
- (B)  $\text{Cu}^+$
- (C)  $\text{Ti}^{3+}$
- (D)  $\text{Mn}^{2+}$

Options given.

 13 Atomic number of **Lanthanum (57)**. Its electronic configuration will be:

1.  $[\text{Xe}] 5d^1 6s^2$
2.  $[\text{Xe}] 4f^1 5d^1 6s^2$
3.  $[\text{Xe}] 4f^{14} 5d^1 6s^2$
4.  $[\text{Xe}] 4f^{14} 5d^2 6s^2$

14 Match compounds/elements with their uses:

- (A) Magnesium based alloy  
(B) Lanthanoid oxide  
(C) Mixed oxides of lanthanoids  
(D) Misch metal

Uses: bullets, petroleum cracking, television screen, lighter metal & iron.

15 What is the **colour of  $\text{Fe}^{3+}$  (aq)** ion?

1. Yellow
2. Violet
3. Colourless
4. Blue-pink

16 Why is **HCl not used** to make medium acidic in oxidation reactions of  **$\text{KMnO}_4$** ?

1.  $\text{KMnO}_4$  oxidises HCl
2.  $\text{KMnO}_4$  reduces HCl
3. HCl acts as oxidising agent
4.  $\text{KMnO}_4$  acts as reducing agent

17 Acidified **potassium dichromate** oxidizes sulphide ( $\text{S}^{2-}$ ) to:

1.  $\text{SO}_4^{2-}$
2.  $\text{SO}_3^{2-}$
3. Sulphur
4.  $\text{SO}_2$

18 Decreasing order of **field strength of ligands**:

- (A)  $\text{S}^{2-}$   
(B) Ethylenediamine  
(C)  $\text{NCS}^-$   
(D)  $\text{CN}^-$

Options given.

19 IUPAC name of  **$[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$**  is:

1. Diamminedichloroplatinum (II)
2. Diammine dichloroplatinum (IV)
3. Dichloro diamminoplatinum (IV)
4. Dichloro diamminoplatinum (II)

20 Select correct statements for  **$[\text{Fe}(\text{CN})_6]^{3-}$**  complex:

- (A) Paramagnetic  
(B)  $\text{sp}^3\text{d}^2$  hybridization  
(C) Magnetic moment = 5.92 BM  
(D)  $\text{d}^2\text{sp}^3$  hybridization

21 Match List-I with List-II:

- (A) Ambident nucleophiles  
(B) Plane polarized light  
(C) Superimposable mirror image  
(D)  $\beta$ -elimination reaction

List-II: Symmetrical object, Saytzeff rule, Cyanides and nitrites, Nicol prism.

22 Optically active alkyl halide undergoing  **$\text{SN}_2$  substitution** involves:

1. retention of configuration
2. racemic mixture
3. inversion of configuration
4. formation of carbocation

23 **Gabriel phthalimide synthesis** is used for preparation of:

1. tertiary amine
2. acid synthesis
3. primary amine
4. secondary amine

24 The reaction shown (Wurtz reaction of alkyl halides with Na in dry ether) is an example of:

1. Sandmeyer reaction
2. Wurtz reaction
3. Kolbe reaction
4. Fittig reaction

25 Reagents used in **hydroboration oxidation of propene**:

- (A)  $B_2H_6$
- (B)  $H_2O$
- (C)  $H_2O_2$
- (D)  $OH^-$

26 Carbohydrate used as **storage molecule in plants** is:

1. Starch
2. Glycogen
3. Cellulose
4. Glucose

27 **Hell-Volhard-Zelinsky reaction** forms:

1. Alcohols
2. Aldehydes
3. Ketones
4.  $\alpha$ -halo carboxylic acids

28 Correct sequence of increasing reactivity towards **nucleophilic addition**:

- (A) Ethanal
- (B) Propanone
- (C) Propanal
- (D) Butanone

29 Which reagents convert **benzene**  $\rightarrow$  **methyl benzoate**?

- (A)  $Br_2/FeBr_3$
- (B) Mg, dry ether
- (C)  $CO_2, H_3O^+$
- (D) Methanol, conc.  $H_2SO_4$

30 Which reagent distinguishes **benzophenone** from **acetone**?

1. Fehling's reagent
2. Tollens reagent
3. 2,4-DNP reagent
4.  $I_2/NaOH$

31 Structural feature for **Aldol condensation**:

1. At least one  $\beta$ -hydrogen
2. At least one  $\alpha$ -hydrogen

CUET UG 2025  
**Previous Year Question**

- 
3. Concentrated base
  4. Lack of  $\alpha$ -hydrogen
- 

2. Aniline
  3. o-Toluidine
  4. Phenol
- 

32 Nitrogen atom in amines is **trivalent with lone pair**.  
Geometry of trimethyl amine is:

1. Tetrahedral
  2. Pyramidal
  3. Square planar
  4. Trigonal planar
- 

36 Amylose is **water soluble part of starch**.  
Percentage solubility is:

1. 20–30%
  2. 15–20%
  3. 30–60%
  4. 50–70%
- 

33 What happens when  **$C_2H_5-O-R$  is treated with  $HX$** ?

1.  $RX$  and  $C_2H_5OH$  formed
  2.  $ROH$  and  $C_2H_5X$  formed
  3.  $C_2H_4X_2$  and  $ROH$  formed
  4.  $RX$  and  $C_2H_5X$  formed
- 

37 Example of **globular protein**:

- (A) Insulin
  - (B) Keratin
  - (C) Albumin
  - (D) Myosin
- 

34 In nitration of benzene using **conc.  $H_2SO_4$  + conc.  $HNO_3$** , the nitrating species is:

1.  $NO_2^-$
  2.  $NO_3^+$
  3.  $NO^+$
  4.  $NO_2^+$
- 

38 Which interactions occur in  **$\beta$ -pleated sheet of proteins**?

1. Ionic bond
  2. Covalent interaction
  3. Hydrogen bond
  4. Banana bond
- 

35 Which compound **will not give azo coupling** with benzene diazonium chloride?

1. Nitrobenzene
- 

39 Match amino acids with **one letter code**:

Lysine, Tryptophan, Tyrosine, Glutamine  
Codes: W, Q, K, Y.

---

40 Arrange compounds in **increasing order of acidic strength**:

- (A) 3-nitrophenol
- (B) 3,5-dinitrophenol
- (C) 2,4,6-trinitrophenol
- (D) Phenol

41. The rate of a gaseous reaction is given by:

$$r = k[A][B]^2 = k[A]^2[B]$$

If the **volume of the reaction vessel is suddenly reduced to 1/4**, the reaction rate relative to the initial rate will become:

- 1. 2 times
- 2. 4 times
- 3. 16 times
- 4. 1/16 times

42. Calculate the **order of the reaction** whose rate law is:

$$R = k[A]^{1/2}[B]^{3/2} \quad R = k[A]^{1/2}[B]^{3/2}$$

- 1. Zero order
- 2. Half order
- 3. First order
- 4. Second order

43. The rate law of a reaction is:

$$r = k(\text{CH}_3\text{CHOCH}_3)^{1/2} \quad =$$

$$k(\text{CH}_3\text{CHOCH}_3)^{1/2} \quad r = k(\text{CH}_3\text{CHOCH}_3)^{1/2}$$

If pressure is measured in **bar** and time in **minutes**, the unit of the **rate constant (k)** will be:

- 1.  $\text{bar}^{3/2} \text{min}^{-1}$
- 2.  $\text{bar}^{1/2} \text{min}^{-1}$

3.  $\text{bar}^{-1/2} \text{min}^{-1}$

4.  $\text{bar}^{-3/2} \text{min}^{-1}$

44. If the **rate of reaction becomes 27 times** when the concentration of reactant is increased **three times**, the **order of reaction** is:

- 1. 0
- 2. 1
- 3. 2
- 4. 3

45. The role of a **catalyst** is to change:

- 1. Gibbs energy of reaction
- 2. Enthalpy of reaction
- 3. Activation energy of reaction
- 4. Equilibrium constant

46. When **ethanol and ethoxyethane** react with **H<sub>2</sub>SO<sub>4</sub>** at **443 K and 413 K respectively**, the products formed are:

- 1. Ethane and ethoxyethane
- 2. Ethylmethyl ether and butene
- 3. Ethylmethyl ether and propene
- 4. Ethene and ethoxyethane

47. The major product in the reaction of **anisole with bromine in ethanoic acid** is:

1. o-bromoanisole
  2. p-bromoanisole
  3. m-bromoanisole
  4. o-bromoanisole and p-bromoanisole
- 

48. In **Williamson synthesis**, the alkoxide ion attacks the alkyl halide via which pathway?

1. SN2
  2. SN1
  3. Depends on nature of alkoxide ion
  4. Depends on nature of alkyl halide
- 

49. Which is the **most reactive hydrogen halide for cleavage of ethers**?

1. HF
  2. HCl
  3. HBr
  4. HI
- 

50. Which **type of ether** is anisole?

1. Dialkyl ether
  2. Diaryl ether
  3. Phenyl alkyl ether
  4. Alkoxy alkyl ether
- 

