

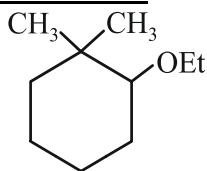


Sample Paper-03

Dropper NEET (2024)

CHEMISTRY

SECTION-A



1. IUPAC name of is :

- (1) 1-Ethoxy-2,2-dimethylcyclohexane
- (2) 2-Ethoxy-1,1-dimethylcyclohexane
- (3) 1,1-Dimethyl-2-ethoxycyclohexane
- (4) 2-Methyl-1,1-ethoxycyclohexane

2. The equivalent weight of MnSO_4 is half of its molecular weight when it is converted into:

- (1) Mn_2O_3
- (2) MnO_4^-
- (3) MnO_2
- (4) MnO_4^{2-}

3. Which of the following alkanols is most soluble in water?

- (1) Butan-1-ol
- (2) Butan-2-ol
- (3) Isobutyl alcohol
- (4) t-Butyl alcohol

4. Which of the following forms a stable diazonium salt at 273 K to 278 K?

- (1) Ethyl amine
- (2) Aniline
- (3) Dimethyl amine
- (4) Benzyl amine

5. **Assertion (A):** The sum of mole fractions of all the components of a solution is unity.

Reason (R): Mole fraction is a temperature dependent quantity.

- (1) **Assertion (R)** is correct, **Reason (R)** is correct and **Reason (R)** is a correct explanation for **Assertion (A)**.
- (2) **Assertion (A)** is correct, **Reason (R)** is correct and **Reason (R)** is not a correct explanation for **Assertion (A)**.
- (3) **Assertion (A)** is correct but **Reason (R)** is incorrect.
- (4) **Assertion (A)** is incorrect but **Reason (R)** is correct.

6. The reaction that takes place at graphite anode in dry cell is:

- (1) $\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn(s)}$
- (2) $\text{Zn(s)} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$
- (3) $\text{Mn}^{2+} + 2\text{e}^- \rightarrow \text{Mn(s)}$
- (4) $\text{Mn(s)} \rightarrow \text{Mn}^{2+} + 2\text{e}^-$

7. **Assertion (A):** The dipole moment helps to predict whether molecule is polar or non-polar.

Reason (R): The dipole moment helps to predict the geometry of molecules.

- (1) **Assertion (A)** is correct, **Reason (R)** is correct and **Reason (R)** is a correct explanation for **Assertion (A)**.
- (2) **Assertion (A)** is correct, **Reason (R)** is correct and **Reason (R)** is not a correct explanation for **Assertion (A)**.
- (3) **Assertion (A)** is correct but **Reason (R)** is incorrect.
- (4) **Assertion (A)** is incorrect but **Reason (R)** is correct.

8. **Statement-I:** An ideal solution obeys Raoult's law.

Statement-II: In an ideal solution, solute-solute as well as solvent-solvent interactions are like solute-solvent interactions.

- (1) Statement I and II both are true.
- (2) Statement I and II both are false.
- (3) Statement I is true statement II is false.
- (4) Statement I is false statement II is true.

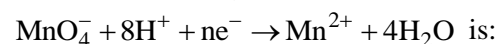
9. If uncertainty in position and momentum are equal then uncertainty in velocity is:

- (1) $\sqrt{\frac{h}{\pi}}$
- (2) $\sqrt{\frac{h}{2\pi}}$
- (3) $\frac{1}{2m} \sqrt{\frac{h}{\pi}}$
- (4) $\frac{1}{m} \sqrt{\frac{h}{\pi}}$

10. The concentration of CaCl_2 solution is 0.5 mole L^{-1} . The moles of CaCl_2 in 500 mL in the solution is:

- (1) 0.25
- (2) 0.45
- (3) 0.3
- (4) 0.5

11. The value of 'n' in;



- (1) 5
- (2) 4
- (3) 2
- (4) 3

12. In a flask at a certain temperature there are 2 g H_2 and 8 g O_2 . The mole fraction of O_2 in the given mixture is:


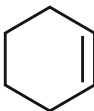

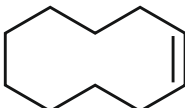
- (1) $\frac{8}{5}$
- (2) 0.2
- (3) 0.25
- (4) 1.0



13. The percent loss in mass after heating a pure sample of 245 g potassium chlorate (molar mass = 122.5 g/mol) will be:

- (1) 12.25 (2) 24.50
(3) 39.18 (4) 49.0

14. Geometrical isomerism is possible in:

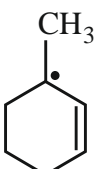
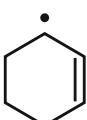
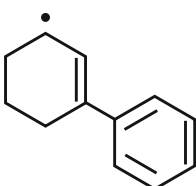
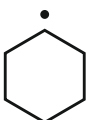
- (1)  (2) 
(3)  (4) 

15. Match **List-I** with **List-II** to find out the correct option.

List-I (Distinguish)		List-II (By)	
(A)	Methanol and ethanol	(I)	Lucas reagent
(B)	Phenol and cyclohexanol	(II)	Sodium metal
(C)	n-Butyl alcohol and tert-butyl alcohol	(III)	Iodoform test
(D)	Methanol and diethyl ether	(IV)	Ferric chloride

- (1) (A) – (II), (B) – (IV), (C) – (I), (D) – (III)
(2) (A) – (IV), (B) – (I), (C) – (II), (D) – (III)
(3) (A) – (I), (B) – (II), (C) – (III), (D) – (IV)
(4) (A) – (III), (B) – (IV), (C) – (I), (D) – (II)

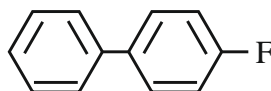
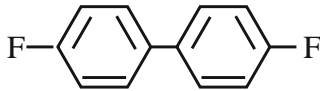
16. Which of the following is the most stable free radical?

- (1)  (2) 
(3)  (4) 

17. In dichromate ion ($\text{Cr}_2\text{O}_7^{2-}$), each Cr is linked to:

- (1) Two O-atoms (2) Three O-atoms
(3) Four O-atoms (4) Five O-atoms

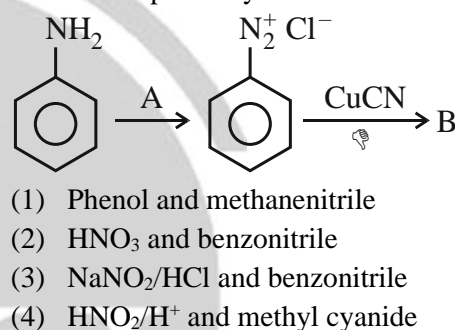
18. $\text{Ph}-\text{NH}_2 \xrightarrow[0^\circ\text{C}]{\text{HNO}_2} \text{A} \xrightarrow[\text{BF}_3]{\text{HF}} \text{B} \xrightarrow{\Delta} \text{C}$, C is:

- (1) $\text{Ph}-\text{N}^+\equiv\text{N}.\text{BF}_4^-$
(2) 
(3) 
(4) $\text{Ph}-\text{F}$

19. For the heterogeneous reaction, $\text{A(s)} + 2\text{B(g)} \rightleftharpoons 3\text{D(s)} + 2\text{Y(g)}$, the relationship between equilibrium constants, K_p and K_c is:

- (1) $K_p = K_c [\text{RT}]^2$ (2) $K_p = K_c [\text{RT}]^0$
(3) $K_p = K_c [\text{RT}]^{-2}$ (4) $K_p = K_c [\text{RT}]^{-1}$

20. A and B respectively are:



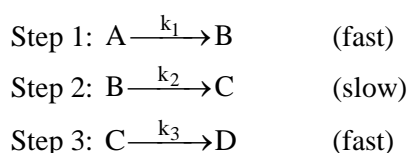
21. Alkyl halides on heating with dry Ag_2O , produces:

- (1) Ether (2) Ester
(3) Ketone (4) Hydrocarbon

22. For the following conversion, which of the following reagent is found to be the most suitable?
 $\text{But-2-yne} \rightarrow \text{trans-But-2-ene}$

- (1) Lindlar's catalyst
(2) Na in liquid ammonia
(3) $\text{NaBH}_4/\text{CH}_3\text{OH}$
(4) Ni/H_2

23. A reaction; $\text{A} \rightarrow \text{B}$, involves following mechanism:



The rate law of the reaction may be given as:

- (1) $\text{rate} = k_1[\text{A}]$ (2) $\text{rate} = k_2[\text{B}]$
(3) $\text{rate} = k_3[\text{C}]$ (4) $\text{rate} = k_1 k_2 k_3 [\text{B}][\text{C}]$



24. The electrode potentials for $\text{Fe}^{3+}(\text{aq}) + 3\text{e}^- \rightarrow \text{Fe}(\text{s})$ and $\text{Fe}^{2+}(\text{aq}) + 2\text{e}^- \rightarrow \text{Fe}(\text{s})$ are x and y volts respectively.

The value of $E^\circ_{\text{Fe}^{3+}/\text{Fe}^{2+}}$ (in volts) will be:

- (1) $x - y$ (2) $3x - 2y$
(3) $3x + 2y$ (4) $3x + y$

25. The correct order of increasing ionic radii of the following isoelectronic species is:

- (1) $\text{S}^{2-} < \text{Cl}^- < \text{P}^{3-} < \text{K}^+$
(2) $\text{Cl}^- < \text{S}^{2-} < \text{P}^{3-} < \text{K}^+$
(3) $\text{K}^+ < \text{Cl}^- < \text{S}^{2-} < \text{P}^{3-}$
(4) $\text{K}^+ < \text{S}^{2-} < \text{Cl}^- < \text{P}^{3-}$

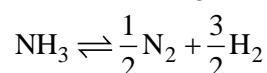
26. The molecule having bond angle of 180° is:

- (1) CO_2 (2) NO_2
(3) SO_2 (4) O_3

27. Hydrolysis constants of two salts KA and KB of weak acids HA and HB are 10^{-8} and 10^{-6} . If the dissociation constant of third acid HC is 10^{-2} . The order of acidic strengths of three acids will be:

- (1) $\text{HA} > \text{HB} > \text{HC}$ (2) $\text{HB} > \text{HA} > \text{HC}$
(3) $\text{HC} > \text{HA} > \text{HB}$ (4) $\text{HA} = \text{HB} = \text{HC}$

28. The equilibrium constant of the reversible reaction $\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$ is K . The equilibrium constant for the following reaction will be:



- (1) K^2 (2) $\frac{K}{2}$
(3) $\frac{1}{K^{1/2}}$ (4) $\frac{1}{2K}$

29. **Statement I:** In presence of DMSO solvent, the rate of $\text{S}_\text{N}2$ reaction increases.

Statement II: DMSO is a polar protic solvent.

- (1) Statement I and II both are true.
(2) Statement I and II both are false.
(3) Statement I is true statement II is false.
(4) Statement I is false statement II is true.

30. Which among the following is the most stable carbanion?

- (1) $(\text{CH}_3)_3\text{C}^-$ (2) $(\text{CH}_3\text{CO})_3\text{C}^-$
(3) $(\text{CH}_3\text{O})_3\text{C}^-$ (4) CH_3CH_2^-

31. $\text{RCOR} + \text{RMgX} \rightarrow \text{Intermediate} \xrightarrow{\text{H}_2\text{O}} \text{Product}$.
In the above reaction sequence, the product is:

- (1) A primary alcohol
(2) A secondary alcohol
(3) A tertiary alcohol
(4) An ether

32. Which of the following is not isostructural with SiCl_4 ?

- (1) PO_4^{3-} (2) NH_4^+
(3) SCl_4 (4) SO_4^{2-}

33. A 10.0 g sample of a mixture of calcium chloride and sodium chloride is treated with Na_2CO_3 solution. The formed calcium carbonate is heated to convert all the calcium, to calcium oxide and the final mass of calcium oxide is 1.62 g. The percentage by mass of calcium chloride in the original mixture is:

- (1) 15.2% (2) 32.1%
(3) 21.8% (4) 11.07%

34. The salt NaA of weak acid HA is dissolved to form its 0.01 M solution. If the degree of hydrolysis is 0.01, the K_a of HA at 25°C is:

- (1) 10^{-6} (2) 10^{-4}
(3) 10^{-8} (4) 10^{-10}

35. Which oxide of manganese is most acidic in nature?

- (1) MnO (2) Mn_2O_7
(3) Mn_2O_3 (4) MnO_2

SECTION-B

36. Match **List I** (species) and **List II** (bond orders) and select the **correct** answer:

List I		List II	
(A)	N_2	(I)	1.0
(B)	O_2	(II)	2.0
(C)	F_2	(III)	2.5
(D)	O_2^+	(IV)	3.0

- (1) (A) – (IV), (B) – (II), (C) – (I), (D) – (III)
(2) (A) – (I), (B) – (III), (C) – (IV), (D) – (II)
(3) (A) – (I), (B) – (II), (C) – (IV), (D) – (III)
(4) (A) – (IV), (B) – (III), (C) – (I), (D) – (II)



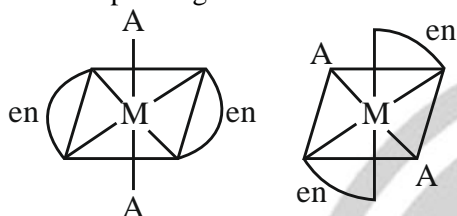
37. A compound MX_2 has observed and normal molar masses 65.6 and 164 respectively. Calculate the apparent degree of ionization of MX_2 .

- (1) 75 % (2) 85 %
(3) 65 % (4) 25 %

38. There is considerable increase in covalent radius from N to P. However, from Sb to Bi only small increase (of 7 pm) in covalent radius is observed. This is due to:

- (1) Poor shielding by completely filled d- and f-orbitals in Bi.
(2) Similar electronegativity of Sb and Bi.
(3) The Bi being last element of the group.
(4) Similar densities of Sb and Bi.

39. The complexes given below are:



- (1) geometrical isomers
(2) position isomers
(3) optical isomers
(4) identical

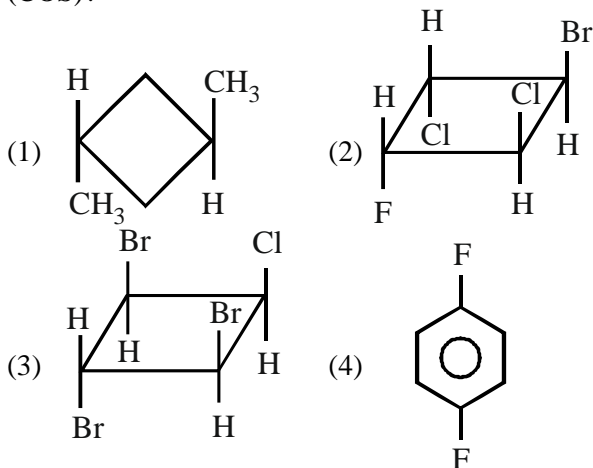
40. The reaction; $\text{X} + 2\text{Y} + \text{Z} \rightarrow \text{N}$, occurs by the following mechanism:

- (i) $\text{X} + \text{Y} \rightarrow \text{M}$: very rapid equilibrium
(ii) $\text{M} + \text{Z} \rightarrow \text{O}$: slow
(iii) $\text{O} + \text{Y} \rightarrow \text{N}$: very fast

What is the rate law for this reaction?

- (1) $\text{Rate} = k[\text{Z}]$
(2) $\text{Rate} = k[\text{X}][\text{Y}]^2[\text{Z}]$
(3) $\text{Rate} = [\text{N}]$
(4) $\text{Rate} = k[\text{X}][\text{Y}][\text{Z}]$

41. Which of the following compound has plane of symmetry (POS) but not centre of symmetry (COS)?



42. **Statement-I:** There are fourteen elements in the lanthanide series and fourteen elements in the actinide series.

Statement-II: All the elements of the actinide series are radioactive.

- (1) Statement I and II both are true.
(2) Statement I and II both are false.
(3) Statement I is true statement II is false.
(4) Statement I is false statement II is true.

43. The paramagnetic species among the following is: Na^+ , Zn^{2+} , Cu^+ , Fe^{3+}

- (1) Na^+ (2) Zn^{2+}
(3) Cu^+ (4) Fe^{3+}

44. Which of the following statements is correct for the complex $[\text{Cr}(\text{NH}_3)(\text{CN})_4(\text{NO})]^{2-}$ (given $n = 1$) ?

- (1) It is d^2sp^3 hybridised.
(2) The chromium is in +1 oxidation state.
(3) It is heteroleptic complex and its aqueous solution is coloured.
(4) All of these.

45. The electrode potentials for

$\text{Cu}^{2+}_{(\text{aq})} + e^- \rightarrow \text{Cu}^+_{(\text{aq})}$ and $\text{Cu}^+_{(\text{aq})} + e^- \rightarrow \text{Cu}(\text{s})$ are +0.15 V and +0.50V respectively. The value of $E^\circ_{\text{Cu}^{2+}/\text{Cu}}$ will be:

- (1) 0.500 V
(2) 0.325 V
(3) 0.650 V
(4) 0.150 V

46. A compound is composed of 74 % C, 8.7 % H and 17.3 % N by mass. If the molecular mass of the compound is 162, what is its molecular formula?

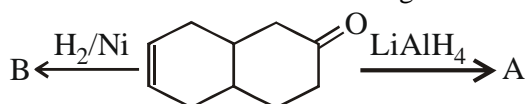
- (1) $\text{C}_5\text{H}_7\text{N}$
(2) $\text{C}_{10}\text{H}_{16}\text{N}_2$
(3) $\text{C}_8\text{H}_{14}\text{N}_3$
(4) $\text{C}_{10}\text{H}_{14}\text{N}_2$

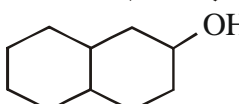
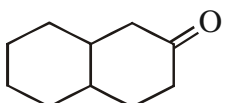
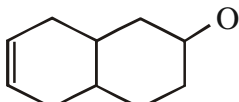
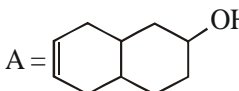
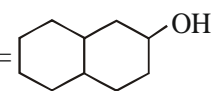
47. Which of the following is not isoelectronic series?

- (1) Cl^- , P^{3-} , Ar
(2) N^{3-} , Ne, Mg^{2+}
(3) B^{3+} , He, Li^+
(4) F^- , S^{2-} , N^{3-}

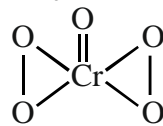


48. What are A and B in the following?



- (1)  in all cases
- (2)  in all cases
- (3)  in all cases
- (4) A =  and B = 

49. CrO_5 has the structure as shown below:



The oxidation state of chromium in the above compound is:

- (1) +4 (2) +5
(3) +6 (4) 0

50. A solution weighing 'a' g has molality 'b'. The molecular mass of solute if the mass of solute is 'c' g, will be:

- (1) $\frac{c}{b} \times \frac{1000}{(a-c)}$ (2) $\frac{b}{a} \times \frac{1000}{(a-b)}$
(3) $\frac{b}{c} \times \frac{1000}{(a-c)}$ (4) $\frac{c}{a} \times \frac{1000}{(b-a)}$

