Sample Paper- 03 **Class 12th NEET (2024)**

CHEMISTRY

SECTION-A

1. $CH_3COOH \xrightarrow{NH_3/\Delta} X \xrightarrow{Br_2/NaOH} Y$

Product Y is:

(1) C_2H_5Br
(2) CH_3Br
(3) CH_3OH
(4) CH_3NH_2

2. For a certain reaction of order 'n' the time for half change $t_{1/2}$ is given by; $t_{1/2} = \frac{2-\sqrt{2}}{K} \times c_0^{1/2}$, where K is rate constant and c_0 is initial concentration. The value of n is:

(1) 1
(2) 2
(3) 0
(4) 0.5

3. For a gaseous reaction, following data is given:

$$A \longrightarrow B, k_1 = 10^{15} e^{-2000/T}$$

$$C \longrightarrow D, k_2 = 10^{14} e^{-1000/T}$$

The temperature at which $k_1 = k_2$ is:

(1) 1000 K
(2) 2000 K
(3) 868.82 K
(4) 434.2 K

4. E° for $\frac{1}{2}Cl_2 + e^- \rightarrow Cl^-$ is 1.36 V. What is E° for $2Cl^- \rightarrow Cl_2 + 2e^-$?

(1) –1.36 V
(2) 0.68 V
(3) –0.68 V
(4) +1.36 V

5. Considering the formation, breaking and strength of hydrogen bond, predict which of the following mixtures will show a positive deviation from Raoult's law?

(1) Methanol and acetone
(2) Chloroform and acetone
(3) Nitric acid and water
(4) Phenol and aniline

6. **Statement I:** $[Cr(H_2O)_6]^{3+}$ is an inner orbital complex.

Statement II: H_2O is a strong field ligand generally.

(1) Statement I and statement II both are correct.
(2) Statement I and statement II both are incorrect.
(3) Statement I is correct but statement II is incorrect.
(4) Statement I is incorrect but statement II is correct.

7. Mass of urea required to prepare 2.5 kg of 0.25 molal aqueous solution is:

(1) 38.12 g (2) 39.20 g
(3) 36.95 g (4) 37.50 g

8. Consider the following half-cell reactions:

I. $A + e^- \rightarrow A^-$; $E^o = 0.96$ V
II. $B^- + e^- \rightarrow B^{2-}$; $E^o = -0.12$ V
III. $C^+ + e^- \rightarrow C$; $E^o = +0.18$ V
IV. $D^{2+} + 2e^- \rightarrow D$; $E^o = -1.12$ V

To attain maximum emf, the correct cell set up is:

(1) $A \mid A^- \parallel D^{2+} \mid D$ (2) $A^- \mid A \parallel D^{2+} \mid D$
(3) $A^- \mid A \parallel D \mid D^{2+}$ (4) $D \mid D^{2+} \parallel A \mid A^-$

9. At 600 K, for the following reaction,

$CH_3Br + OH^- \rightarrow CH_3OH + Br^-$

only 0.01% of the total number of collisions are effective. The energy of activation is:

(1) 11.05 kJ mol^{-1} (2) 45.95 kJ mol^{-1}
(3) 0.454 kJ mol^{-1} (4) 4.80 kJ mol^{-1}

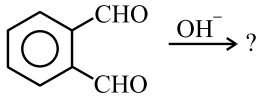
10. An aqueous solution containing 1 M each of Au^{3+}, Cu^{2+}, Ag^+, Li^+ is being electrolysed by using inert electrodes. The values of standard potentials are:

$E^\circ_{Ag^+/Ag} = 0.80$ V, $E^\circ_{Cu^{2+}/Cu} = 0.34$ V,

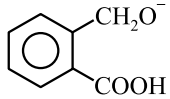
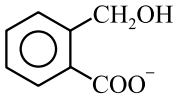
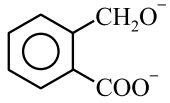
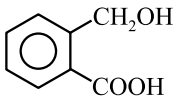
$E^\circ_{Au^{3+}/Au} = 1.50$ V, $E^\circ_{Li^+/Li} = -3.03$ V,

With increasing voltage, the sequence of deposition of metals on the cathode will be:

(1) Li, Cu, Ag, Au (2) Cu, Ag, Au
(3) Au, Ag, Cu (4) Au, Ag, Cu, Li

11. 

The product of the above reaction is:

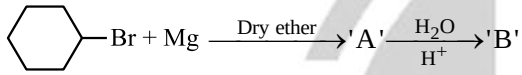
(1) 
(2) 
(3) 
(4) 

12. What is the order of basicity of:

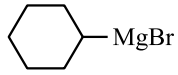
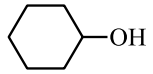
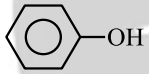
p-methylaniline, (I) m-methylaniline (II)

Aniline, (III) o-methylaniline (IV)

(1) I > II > III > IV
(2) I > II > IV > III
(3) IV > I > II > III
(4) II > I > IV > III

13. 

The product 'B' is:

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

14. A solution of 18 g of non-volatile, non-electrolyte solute in 150 g of water was found to have a boiling point of 100.34°C. If K_b value for water is 0.51 K kg mol^{-1}, what is the molar mass of the solute?

(1) 180 (2) 60
(3) 100 (4) 342

15. Amongst the following, the most stable complex is:

(1) $[Co(H_2O)_6]^{3+}$ (2) $[Co(ox)_3]^{3-}$
(3) $[Co(ONO)_6]^{3-}$ (4) $[CoF_6]^{3-}$

16. **Statement I:** Mn_2O_7 is acidic in nature.

Statement II: $KMnO_4$ is purple in colour due to charge transfer.

(1) Statement I and statement II both are correct.
(2) Statement I and statement II both are incorrect.
(3) Statement I is correct but statement II is incorrect.
(4) Statement I is incorrect but statement II is correct.

17. Glucose can be tested by:

(1) Tollen's reagent (2) Fehling's reagent
(3) Both (1) and (2) (4) None of these

18. The bond angles of NH_3, NH_4^+ and NH_2^- are in the order:

(1) $NH_2^- > NH_3 > NH_4^+$
(2) $NH_4^+ > NH_3 > NH_2^-$
(3) $NH_3 > NH_2^- > NH_4^+$
(4) $NH_3 > NH_4^+ > NH_2^-$

19. The density (in g mL^{-1}) of a 3.6 M sulphuric acid solution, i.e., 29% H_2SO_4 (molar mass = 98 g mol^{-1}) by mass will be:

(1) 1.45
(2) 1.64
(3) 1.88
(4) 1.22

20. **Statement I:** Helium and neon have smallest atomic size among all the elements of group 18.

Statement II: Noble gases have highest ionization energies in their respective periods.

(1) Statement I and statement II both are correct.
(2) Statement I and statement II both are incorrect.
(3) Statement I is correct but statement II is incorrect.
(4) Statement I is incorrect but statement II is correct.

21. **Assertion (A):** In Hunsdiecker reaction, alkyl chloride is formed in poor yield .

Reason (R): In this reaction, carbanion is formed as an intermediate.

(1) Assertion and Reason both are true and Reason is the correct explanation of Assertion.
(2) Assertion and Reason both are true and Reason is not the correct explanation of Assertion.
(3) Assertion is true but Reason is false.
(4) Assertion and Reason both are false.

22. Transition metals are less reactive because of their:

(1) high I.P. and low melting point
(2) high I.P. and high melting point
(3) low I.P. and low melting point
(4) low I.P. and high melting point

23. Which of the following is not an actinide?

(1) Curium (2) Californium

(3) Uranium (4) Erbium

24. **Assertion (A):** Phenol does not react with $NaHCO_3$.

Reason (R): Phenol is less acidic than H_2CO_3.

(1) **Assertion (A)** and **Reason (R)** both are true and **Reason (R)** is the correct explanation of **Assertion (A)**.

(2) **Assertion (A)** and **Reason (R)** both are true and **Reason (R)** is not the correct explanation of **Assertion (A)**.

(3) **Assertion (A)** is true but **Reason (R)** is false.

(4) **Assertion (A)** and **Reason (R)** both are false.

25. When acidified solution of $K_2Cr_2O_7$ is shaken with aqueous solution of $FeSO_4$, then:

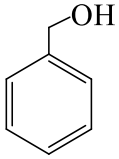
(1) $Cr_2O_7^{2-}$ is reduced to Cr^{3+} ions

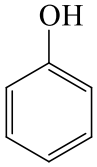
(2) $Cr_2O_7^{2-}$ ion is converted to CrO_4^{2-} ions

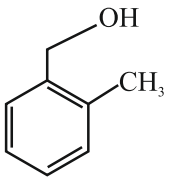
(3) $Cr_2O_7^{2-}$ ion is reduced to Cr

(4) $Cr_2O_7^{2-}$ ion is converted to CrO_3

26. Which of the following is NOT an aromatic alcohol?

(1) 

(2) 

(3) 

(4) None of these

27. Decreasing order of reducing power of hydrogen halides is:

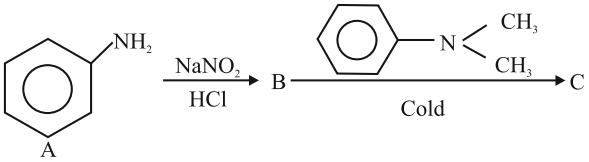
(1) HI > HBr > HCl > HF

(2) HF > HI > HBr > HCl

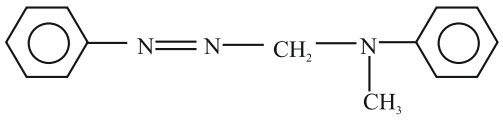
(3) HI > HF > HBr > HCl

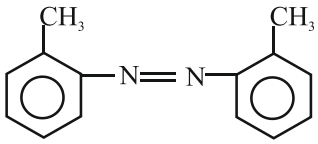
(4) None of these

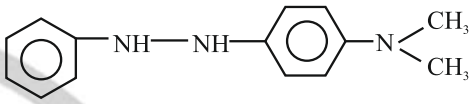
28. In a reaction of aniline, a colored product C was obtained:

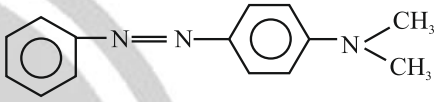


The structure of C would be:

(1) 

(2) 

(3) 

(4) 

29. Among the following, the least basic amine in gaseous phase is:

(1) Ethanamine

(2) N-Ethylethanamine

(3) N, N-Diethylethanamine

(4) Methanamine

30. The compound having least dipole moment is:

(1) $CH_3 - Br$

(2) $CH_3 - F$

(3) $CH_3 - Cl$

(4) $CH_3 - I$

31. Which among the following will exist as a pair of enantiomers?

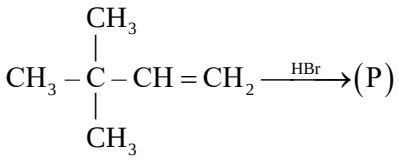
(1) $CH_3CH_2CH_2 - OH$

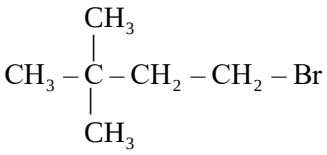
(2) $CH_3\underset{\underset{OH}{|}}{C}HCH_3$

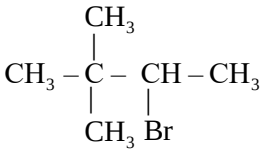
(3) $CH_3CH_2CH_2CH_2 - OH$

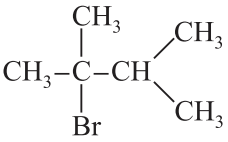
(4) $CH_3CH_2\underset{\underset{OH}{|}}{C}HCH_3$

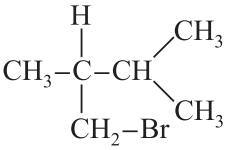
32. Major product (P) of the following reaction is:



(1) 

(2) 

(3) 

(4) 

33. The final product for the given reaction is:

$CH_3 - CO - CH_2CH_3 \xrightarrow{\text{conc. } HNO_3}$

(1) $CH_3 - CH_2 - OH + CH_3CH_2COOH$

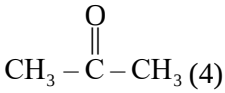
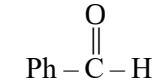
(2) $CH_3 - COOH + CH_3 - COOH$

(3) $CH_3OH + CH_3 - CH_2 - CH_2OH$

(4) $CH_3 - CH_2 - OH + HCOOH$

34. Which of the following compounds will form yellow precipitate when treated with alkaline I_2 solution?

(1) C_2H_5CHO (2) $CH_3 - O - CH_3$

(3)  (4) 

35. $[Co(NH_3)_4Br_2]Cl$ can show:

(1) Geometrical isomerism only

(2) Both geometrical and optical isomerism

(3) Both geometrical and ionization isomerism

(4) Both optical and ionization isomerism

SECTION-B

36. In a complex, CFSE depends on:

(1) Oxidation state of metal ion

(2) Strength of ligand

(3) Series (3d or 4d or 5d) of transition metals of different metals of same group

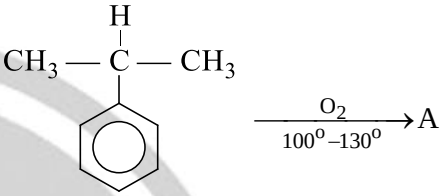
(4) All of these

37. Among the following the one that is ambidentate ligand is:

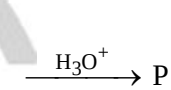
(1) NO_2^- (2) NO_3^-

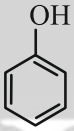
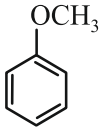
(3) NO (4) $C_2O_4^-$

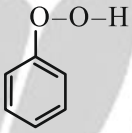
38. Find P in the following reaction sequence:



$\xrightarrow[100^o-130^o]{O_2}$ A

$\xrightarrow{H_3O^+}$ P + 

(1)  (2) 

(3)  (4) Both (1) and (3)

39. The melting point is highest for:

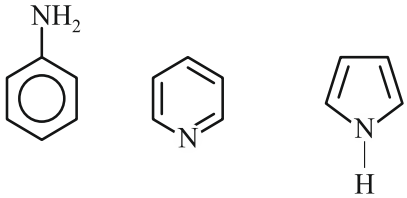
(1) Primary amines

(2) Secondary amines

(3) Tertiary amines

(4) Cannot be predicted

40. The basic strength order for the following compounds is:



1 2 3

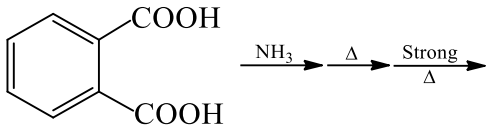
(1) 1 > 2 > 3

(2) 3 > 2 > 1

(3) 2 > 1 > 3

(4) 2 > 3 > 1

41. The total number of π-bonds in the final product is:



(1) 4 (2) 5
(3) 3 (4) 6

42. The potential value of pH of acidic amino acid is:
(1) 3 (2) 7
(3) 10 (4) 12

43. Sucrose is an example of:
(1) Monosaccharide
(2) Disaccharide
(3) Trisaccharide
(4) Tetrasaccharide

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

List-I (Reaction)		**List-II (Reagent/catalyst)**	
(A)	Cannizzaro reaction	(I)	$SnCl_2/HCl$
(B)	Stephen's reaction	(II)	NaOH
(C)	Clemmensen reduction	(III)	Zn/Hg-conc. HCl
(D)	Rosenmund's method	(IV)	$\frac{Pd/BaSO_4}{\text{Boiling xylene}}$

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

45. $KMnO_4$ on treatment with concentrated H_2SO_4 forms a compound (X) which decomposes explosively on heating forming (Y). (X) and (Y) respectively are:
(1) Mn_2O_7, MnO_2 (2) Mn_2O, Mn_2O_3
(3) $MnSO_4$, Mn_2O_3 (4) Mn_2O_3, MnO_2

46. Glucose does not react with which of the following?
(1) HCN
(2) NH_2OH
(3) $C_6H_5NHNH_2$
(4) $NaHSO_3$

47. The correct boiling point order is:
(1) $HF > H_2O > NH_3$
(2) $H_2O > HF > NH_3$
(3) $NH_3 > H_2O > HF$
(4) $HF > NH_3 > H_2O$

48. Match the reaction given in **List-I** with the statements given in **List-II**.

List-I		**List-II**	
(A)	Ammonolysis	(I)	Amine with a lesser number of carbon atoms
(B)	Gabriel phthalimide synthesis	(II)	Detection test for primary amines
(C)	Hoffmann-bromamide reaction	(III)	Reaction of phthalimide with KOH and R–X
(D)	Carbylamine reaction	(IV)	Reaction of alkyl halides with NH_3

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

49. Alanine is _____.
(1) an enzyme
(2) purine base of nucleic acid
(3) hormone
(4) α-amino acid

50. In solid state, PBr_5 exist as:
(1) PBr_5 (2) $[PBr_4]^+ [PBr_6]^-$
(3) $[PBr_6]^+ [PBr_4]^-$ (4) $[PBr_4]^+ [Br]^-$