



Sample Paper-05

Dropper NEET (2024)

CHEMISTRY

SECTION-A

1. A solution containing 2.665 g of $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ is passed through a cation exchanger. The chloride ions obtained in solution were treated with excess of AgNO_3 to give 2.87 g of AgCl . The structure of compound is :

- (1) $[\text{CrCl}(\text{H}_2\text{O})_5]\text{Cl}_2 \cdot \text{H}_2\text{O}$
 (2) $[\text{CrCl}(\text{H}_2\text{O})_4]\text{Cl} \cdot \text{H}_2\text{O}$
 (3) $[\text{CrCl}_2(\text{H}_2\text{O})_4]\text{Cl} \cdot \text{H}_2\text{O}$
 (4) $[\text{CrCl}_2(\text{H}_2\text{O})_5]\text{Cl}_2 \cdot \text{H}_2\text{O}$

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

List-I		List-II	
(A)	O_2^-	(I)	Paramagnetic
(B)	CN^-	(II)	Diamagnetic
(C)	CO	(III)	Diamagnetic
(D)	^+NO	(IV)	Diamagnetic

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

3. If each orbital can take maximum of three electrons, the number of elements in the third period of the periodic table will be :

- (1) 12 (2) 6
 (3) 8 (4) 24

4. Mole fraction of the solute in 0.5 molal aqueous solution is :

- (1) $\frac{1}{112}$ (2) $\frac{1}{56}$
 (3) $\frac{1}{25}$ (4) $\frac{1}{150}$

5. Match the compounds given in **List-I** with the name reactions given by them in **List-II** and select the correct option given below :

List-I		List-II	
(A)	Phenol	(I)	Etard
(B)	Acetic acid	(II)	Cannizzaro
(C)	Formaldehyde	(III)	Reimer-Tiemann
(D)	Toluene	(IV)	Hell-Volhard-Zelinsky

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

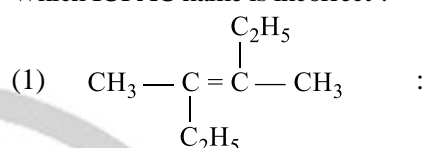
6. The total number of optically active products formed by the monochlorination of 2-methylpentane is :

- (1) 4 (2) 5
 (3) 6 (4) 8

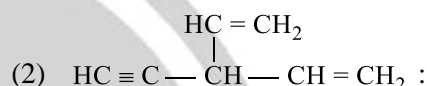
7. Molality of aqueous solution of urea is 3 m. The mass percentage of urea in the solution is :

- (1) 10.5% (2) 25.25%
 (3) 15.25% (4) 12.25%

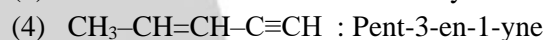
8. Which IUPAC name is incorrect ?



2,3-Diethylbutene



3-Ethynylpenta-1,4-diene



9. $\frac{N_A}{2}$ atoms of X (g) are converted into X^- (g) by absorbing E_1 energy. $2N_A$ atoms of X (g) are converted into X^- (g) by releasing E_2 energy. Calculate ionisation enthalpy and electron gain enthalpy of X (g) per atom.

- (1) $\text{I.E.} = \frac{2E_1}{N_A}$, $\Delta_{\text{eg}}H = -\frac{E_2}{2N_A}$
 (2) $\text{I.E.} = -\frac{2E_1}{2N_A}$, $\Delta_{\text{eg}}H = \frac{E_2}{2N_A}$
 (3) $\text{I.E.} = \frac{2E_1}{2N_A}$, $\Delta_{\text{eg}}H = -\frac{E_2}{2N_A}$
 (4) $\text{I.E.} = \frac{N_A}{2E_1}$, $\Delta_{\text{eg}}H = -\frac{2N_A}{E_2}$

10. **Statement-I** : There is no exchange in internal energy in a cyclic process.

Statement-II : In a cyclic process, the system returns to original state in a number of steps.

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



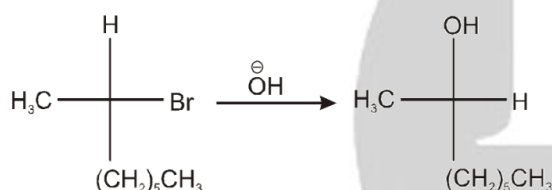
11. The compound, $\text{ClCH}=\text{CHCH}(\text{OH})\text{COOH}$ with molecular formula $\text{C}_4\text{H}_5\text{O}_3\text{Cl}$ can exhibit :
- (1) Geometrical, optical, position and functional isomerism.
 - (2) Geometrical, optical and functional isomerism only.
 - (3) Position and functional isomerism only.
 - (4) Geometrical and optical isomerism only.

12. **Statement-I:** Addition of inert gases at equilibrium will support the dissociation of PCl_5 at constant temperature.

Statement-II: The addition of inert gas at constant volume will not affect the equilibrium.

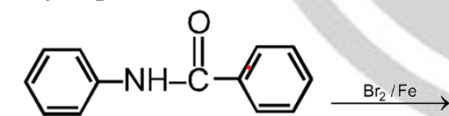
- (1) Statement I and Statement II both are correct.
- (2) Statement I is correct but Statement II is incorrect.
- (3) Statement I is incorrect but Statement II is correct.
- (4) Statement I and Statement II both are incorrect.

13. Following reaction is :



- (1) E_1
- (2) $\text{S}_{\text{N}}1$
- (3) E_2
- (4) $\text{S}_{\text{N}}2$

14. The major product obtained in the following is:



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

15. Select the correct order of the strength of acids given below :

- (1) $\text{HClO}_4 < \text{HClO}_3 < \text{HClO} < \text{HClO}_2$
- (2) $\text{HClO}_4 < \text{HClO}_3 < \text{HClO}_2 < \text{HClO}$
- (3) $\text{HClO} < \text{HClO}_2 < \text{HClO}_3 < \text{HClO}_4$
- (4) None of these

16. The correct statement in respect of protein haemoglobin is that it :

- (1) Functions as a catalyst for biological reactions.
- (2) Maintains blood sugar level.
- (3) Act as an oxygen carrier in the blood.
- (4) Forms antibodies and offers resistance to diseases.

17. Which of the following halides is most acidic ?

- (1) PCl_3
- (2) SbCl_3
- (3) BiCl_3
- (4) CCl_4

18. **Assertion (A) :** The spin only magnetic moment of Sc^{3+} is 1.73 B.M.

Reason (R) : The spin only magnetic moment of an ion is equal to $\sqrt{n(n+2)}$; where n is the number of unpaired electrons in the ion.

- (1) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is a correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not a correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true and **Reason (R)** is false.
- (4) **Assertion (A)** is false and **Reason (R)** is true.

19. Among the three types of orbitals p, d and f :

- (1) Both p and f-orbitals have center of symmetry.
- (2) Both p and d-orbitals have center of symmetry.
- (3) Only d-orbitals have center of symmetry.
- (4) f-orbitals alone have center of symmetry.

20. Which one of the following is a free radical ?

- (1) CO
- (2) CN^-
- (3) NO
- (4) OH^-

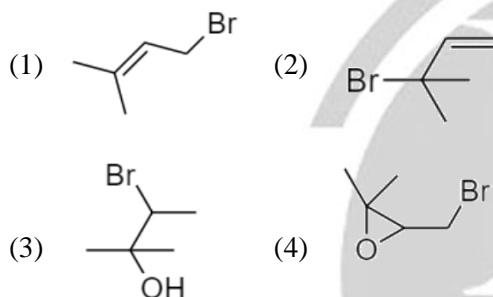


21. The concentration of a reactant decreases linearly with time. What is the order of the reaction ?
- (1) 0 (2) 1
(3) 2 (4) 3

22. A reversible process is that which always :
- (1) takes infinite time for completion.
(2) satisfies $\Delta S = 0$ for universe.
(3) satisfies $\Delta G = 0$.
(4) gives minimum work.

23. Reaction of phenyl benzoate with an excess of methyl magnesium bromide gives a mixture of :
- (1) Trimethyl methanol and phenol
(2) 2-phenylpropan-2-ol and phenol
(3) Acetophenone and toluene
(4) 2-phenylbenzoic acid and toluene

24. The major product formed in the reaction of 2-methylbut-3-en-2-ol with HBr is :



25. The monomer of biopolymer DNA is :
- (1) Nucleotide (2) Amino acid
(3) Disaccharide (4) Fatty acid

26. Natural sugar and amino acids are respectively :
- (1) D and L (2) D and D
(3) L and D (4) L and L

27. Addition of BH_3 to a carbon-carbon double bond is :
- (1) Anti-Markovnikov syn addition
(2) Anti-Markovnikov anti addition
(3) Markovnikov syn addition
(4) Markovnikov anti addition

28. **Statement-I:** Dextro-isomers rotate the plane of polarised light towards right.
Statement-II: Dextro-isomers are represented by putting (D) before their name.
- (1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

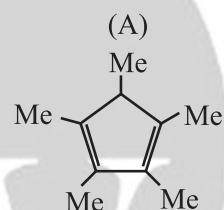
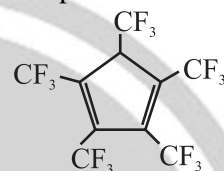
29. There is $\pi\pi$ - $d\pi$ multiple bonding in :

- (1) NO
(2) CO_2
(3) NO_2
(4) CS_2

30. If hexan-3-one is treated with NaBH_4 followed by hydrolysis with D_2O , the product will be :

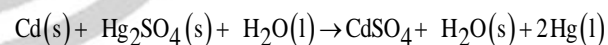
- (1) $\text{CH}_3\text{CH}_2\text{CH}(\text{OD})\text{CH}_2\text{CH}_2\text{CH}_3$
(2) $\text{CH}_3\text{CH}_2\text{CD}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$
(3) $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{CH}_3$
(4) $\text{CH}_3\text{CH}_2\text{CD}(\text{OD})\text{CH}_2\text{CH}_2\text{CH}_3$

31. The correct order of acidity of the following compounds is :



- (1) $\text{B} > \text{C} > \text{A}$ (2) $\text{C} > \text{B} > \text{A}$
(3) $\text{A} > \text{C} > \text{B}$ (4) $\text{A} > \text{B} > \text{C}$

32. Consider the following cell reaction :



The value of E_{Cell}^0 is 4.315 V at 25°C .

If $\Delta H^\circ = -825.2 \text{ kJ mol}^{-1}$, the standard entropy change, ΔS° in J K^{-1} is :

[Given: Faraday's constant = 96487 C mol^{-1}]

- (1) 25 (2) 30
(3) 35 (4) 15

33. Solid crystalline PCl_5 has structure which of the following ?

- (1) Bipyramidal moieties
(2) Octahedral and tetrahedral ions
(3) Square pyramidal moieties
(4) Pentagonal moieties



34. At 363 K, the vapour pressure of A is 21 kPa and that of B is 18 kPa. 1 mol of A and 2 mol of B are mixed. Assuming that this solution is ideal, the vapour pressure of the mixture is _____ kPa.

- (1) 22 (2) 19
(3) 17 (4) None of these

35. The equilibrium ;



is followed to set-up at 127°C in a closed vessel. The total pressure at equilibrium was 20 atm. The K_c for the reaction is :

- (1) 0.092 M² (2) 0.085 M²
(3) 3.045 M² (4) None of these

SECTION-B

36. EDTA⁴⁻ is ethylenediaminetetraacetate ion. The total number of N-Co-O bond angles in [Co(EDTA)]¹⁻ complex ion is :

- (1) 4 (2) 10
(3) 12 (4) 8

37. [Co(NH₃)₄(NO₂)₂]Cl exhibits :

- (1) ionisation isomerism, geometrical isomerism and optical isomerism.
(2) linkage isomerism, geometrical isomerism and optical isomerism.
(3) linkage isomerism, ionisation isomerism and optical isomerism.
(4) linkage isomerism, geometrical isomerism and ionisation isomerism.

38. Molten sodium chloride conducts electricity due to the presence of :

- (1) Na atom (2) Cl atom
(3) Ions (4) Free electrons

39. At 100°C the vapour pressure of a solution of 6.5 g of a solute in 100 g water is 732 mm. If $K_b = 0.52$, the boiling point of this solution will be :

- (1) 102°C (2) 103°C
(3) 101°C (4) 100°C

40. In the given transformation, which of the following is the most appropriate reagent ?



- (1) Zn(Hg) - HCl (2) Na, liq. NH₃
(3) NaBH₄ (4) NH₂NH₂, OH⁻

41. Vitamin B₆ is known as :

- (1) pyridoxine (2) thiamine
(3) tocopherol (4) riboflavin

42. Which of the following contains secondary amino group ?

- (1) Leucine (2) Glycine
(3) Proline (4) None of these

43. What is the relationship between benzyl acetate and phenyl acetate ?

- (1) Isomers (2) Rotamers
(3) Metamers (4) None of these

44. What is the energy in eV required to excite the electron from $n = 1$ to $n = 2$ state in hydrogen atom ? (n = principal quantum number)

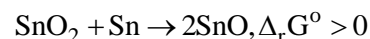
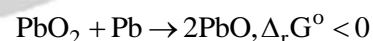
- (1) 13.6 (2) 3.4
(3) 17 (4) 10.2

45. **Assertion:** In methane, ammonia and water, the respective central atoms are sp³ hybridised.

Reason: All the three are having same bond angle.

- (1) Both **Assertion (A)** and **Reason (R)** are the true and **Reason (R)** is a correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are the true but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true and **Reason (R)** is false.
(4) **Assertion (A)** is false and **Reason (R)** is true.

46. In view of the signs of $\Delta_r G^\circ < 0$ for the following reactions:



Which oxidation states are more characteristics for lead and tin?

- (1) For lead +2, for tin +2
(2) For lead +4, for tin +4
(3) For lead +2, for tin +4
(4) For lead +4, for tin +2

47. pOH of H₂O is 7 at 298 K. If water is heated to 350 K, which of the following statement should be true ?

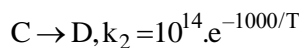
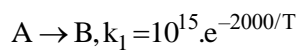
- (1) pOH will decrease.
(2) pH will increase.
(3) pOH will remain 7.
(4) Both (1) and (2).



48. If 1.5 moles of oxygen combine with Al to form Al_2O_3 , the weight of Al used in the reaction is :

- (1) 27 g (2) 40.5 g
(3) 54 g (4) 81 g

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



The temperature at which $k_1 = k_2$ is :

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

50. Bond angles of NH_3 , PH_3 , AsH_3 and SbH_3 are in the order :

- (1) $\text{PH}_3 > \text{AsH}_3 > \text{SbH}_3 > \text{NH}_3$
(2) $\text{SbH}_3 > \text{AsH}_3 > \text{PH}_3 > \text{NH}_3$
(3) $\text{SbH}_3 > \text{AsH}_3 > \text{NH}_3 > \text{PH}_3$
(4) $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$



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