



Sample Paper- 02

NEET XII (2024)

CHEMISTRY

Answer Key

- | | |
|---------|---------|
| 1. (1) | 26. (4) |
| 2. (4) | 27. (4) |
| 3. (3) | 28. (2) |
| 4. (1) | 29. (1) |
| 5. (4) | 30. (2) |
| 6. (3) | 31. (3) |
| 7. (2) | 32. (1) |
| 8. (3) | 33. (4) |
| 9. (3) | 34. (3) |
| 10. (3) | 35. (3) |
| 11. (3) | 36. (2) |
| 12. (4) | 37. (4) |
| 13. (3) | 38. (2) |
| 14. (2) | 39. (1) |
| 15. (1) | 40. (4) |
| 16. (4) | 41. (3) |
| 17. (3) | 42. (1) |
| 18. (3) | 43. (1) |
| 19. (4) | 44. (1) |
| 20. (2) | 45. (4) |
| 21. (3) | 46. (4) |
| 22. (1) | 47. (1) |
| 23. (2) | 48. (3) |
| 24. (1) | 49. (1) |
| 25. (1) | 50. (1) |



Hints & Solutions

1. (1)

This law is only applicable for dilute solutions, where the interactions between the solute and solvent molecules are negligible. In concentrated solutions, the interactions between the solute and solvent molecules become significant, and the vapor pressure of the solvent deviates from Raoult's law.

Henry's law is only applicable when the molecules of the system are in a state of equilibrium.

2. (4)

Earlier rate = $K[A]^n [B]^m$

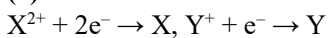
$$\text{New rate} = K[2A]^n \left[\frac{B}{2}\right]^m$$

$$\frac{\text{New rate}}{\text{earlier rate}} = 2^n 2^{-m} = 2^{n-m}$$

3. (3)

$$\begin{aligned} E_{\text{cell}} &= -0.0591 \log_{10} \frac{10^{-8}}{10^{-3}} \\ &= -0.0591 \log_{10} 10^{-5} \\ &= 0.295 \text{ volt} \end{aligned}$$

4. (1)



2 mole e^- produced X = 1 mole = $(1 \times M)g$

2 mole e^- produced Y = 2 mole = $2 \times \frac{M}{2} = M g$

Hence ratio of the masses of Y : X is 1 : 1

5. (4)

Given in question is that, when sugar is dissolved in water the solution feels cool to touch. This meant that when sugar is dissolved in water, it absorbed the heat of the provided water to get solvated. However, when the reaction going on is absorbing heat from the medium it means that the reaction is endothermic.

6. (3)

$$\frac{0.693}{t_{1/2}} = \frac{2.303}{t} \log_{10} \left(\frac{a}{a-x} \right)$$

$$\frac{0.693}{10} = \frac{2.303}{100} \log_{10} \left(\frac{100}{100-x} \right)$$

$$x = 99.9\%$$

7. (2)

Assertion (A): The rate constant for a zero-order reaction is equal to rate of reaction. **(True)**

Reason (R): $t_{1/2}$ for zero order reaction is directly proportional to initial concentration. **(True)**

Reason: For a zero-order reaction;

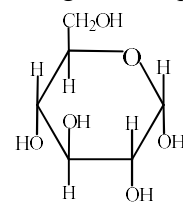
$$\text{Rate} = k[A]^0$$

$$\text{Rate} = k \times 1$$

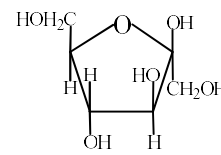
$$\text{Rate} = k$$

8. (3)

The given compounds are functional isomers.



α -D-(+)-glucose



β -D-(-)-Fructose

9. (3)

For BaSO_4 :

$$\Lambda_m^\infty = \Lambda_m^\infty \text{ of } (\text{BaCl}_2 + \text{H}_2\text{SO}_4 - 2\text{HCl}) \text{ and}$$

$$\Lambda_{\text{equiv.}}^\infty = \Lambda_{\text{equiv.}}^\infty \text{ of } (\text{BaCl}_2 + \text{H}_2\text{SO}_4 - \text{HCl})$$

10. (3)

We know that

$$Y_A = \frac{P_A^\circ X_A}{P_{\text{total}}} \text{ or } \frac{Y_A}{X_A} = \frac{P_A^\circ}{P_{\text{total}}}$$

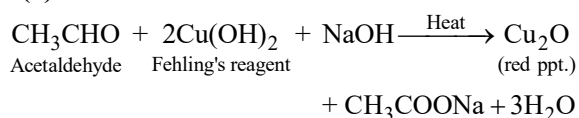
$$\therefore P_A^\circ > P_{\text{total}} \text{ so } \frac{Y_A}{X_A} > 1 \text{ or } Y_A > X_A$$

11. (3)

$$\frac{0.55}{M} \times 3 = \frac{0.55 \times 100 \times 60}{96500}$$

$$\Rightarrow M = 48.25 \text{ g/mol}$$

12. (4)





13. (3)

Statement I: In presence of DMSO, the rate of S_N2 reaction increases. **(True)**

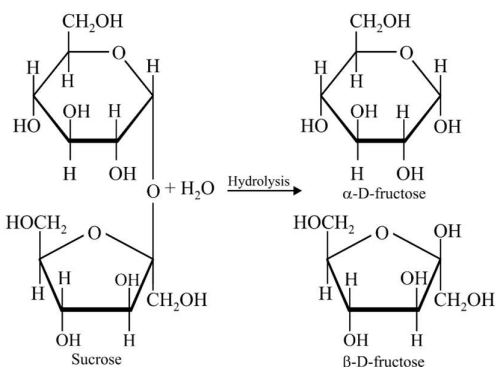
Statement II: DMSO is a polar protic solvent. **(False)**

DMSO is a polar aprotic solvent.

14. (2)

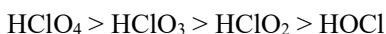
Sucrose is produced naturally in plants, from which table sugar is refined.

It is made up of one molecule of glucose and one molecule of fructose joined together. As shown below:



15. (1)

Decreasing order of thermal stability of oxy-acids of chlorine:



In HClO_4 , chlorine is in +7 oxidation state.

16. (4)

Assertion (A): Formic acid is the strongest mono carboxylic acid. **(False)**

Reason (R): Trifluoroacetic acid is weaker than formic acid. **(False)**

Trifluoroacetic acid is strongest organic acid.

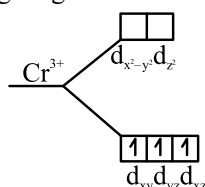
17. (3)

CFSE depends on nature of ligand.

In the given NH_3 is strongest ligand. Hence option (3) has highest CFSE.

18. (3)

Degenerate orbitals of $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$ are shown in the following diagram:



Hence, according to the options given, degenerate orbitals are d_{xz} and d_{yz} .

19. (4)

The availability of lone pair of electrons on an atom decreases down a group because of increase in size. Hence, basicity of these hydrides decreases from NH_3 to SbH_3 due to increase in the size of the atom from N to Sb.

20. (2)

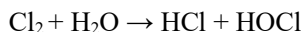
NeF_2 does not exist.

21. (3)

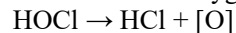
Pt is an inert element and does not react very easily. Zn, Ti and Fe are quite reactive.

22. (1)

Chlorine bleaches by the process of oxidation. It needs moisture for its bleaching action. It reacts with water to form hydrochloric and hypochlorous acids.



Hypochlorous acid is unstable, and it easily dissociates to form nascent oxygen.



Nascent oxygen is more powerful oxidizing agent. Its formation is responsible for the bleaching nature of chlorine in the presence of moisture.

23. (2)

The oxidation number of sulphur in the S_8 molecule is 0, because it is in elemental form.

Covalency of S_8 molecule is 2 because each sulphur atom forms two (2) covalent bonds in its crown structure.

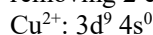
Rhombic sulphur is the most stable allotropic form of sulphur, but it is not the explanation of assertion as the stability of allotropic form of sulphur does not depend on the valency.

24. (1)

Column-I		Column-II	
(A)	Ethyl amine	(I)	1° amine
(B)	Dimethyl amine	(II)	2° amine
(C)	Triethyl amine	(III)	3° amine
(D)	Benzyl amine	(IV)	Aryl amine

25. (1)

Cu has valence shell configuration of $3d^{10} 4s^1$, on removing 2 electrons it becomes;



Hence, leaving one unpaired electron in d-subshell.

26. (4)

On heating $\text{K}_2\text{Cr}_2\text{O}_7$ decomposes to give potassium chromate, chromium oxide with evolution of O_2 gas.

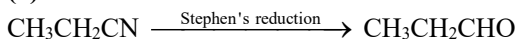




27. (4)

Chloroethene : Vinylic halide
Benzyl chloride : Benzylic halide
Chlorobenzene : Aryl halide
Chloroethane : Alkyl halide

28. (2)



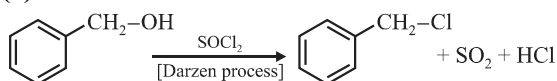
29. (1)

CO is neutral towards litmus. SnO_2 and ZnO are amphoteric as they form salts and water with acids and bases. SiO_2 is acidic as it forms salts with bases.

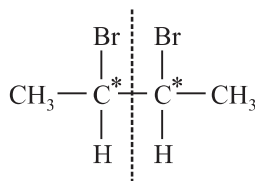
30. (2)

This is because of poor screening effect by 4f electrons, which lead to the lanthanoid contraction. Hence, this is the reason that Zn and Hf have almost equal atomic size.

31. (3)

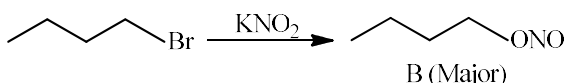
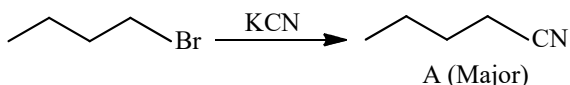


32. (1)

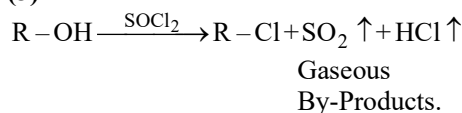


Symmetrical molecule, optical active isomers = 2^{n-1}
= 2^{2-1}
= $2^1 = 2$

33. (4)



34. (3)



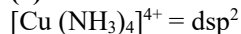
35. (3)

Benzylidene chloride : $\text{C}_6\text{H}_5\text{CHCl}_2$

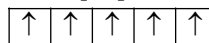
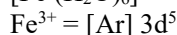
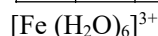
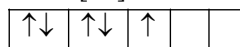
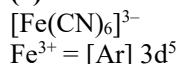
36. (2)

Rosenmund's reduction is used for the preparation of aldehydes.

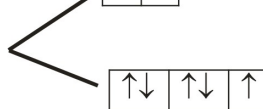
37. (4)



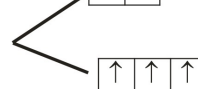
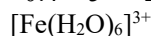
38. (2)



n = 5



$$-0.4 \times 5 = -2.0$$

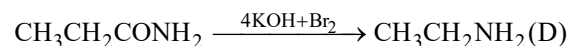
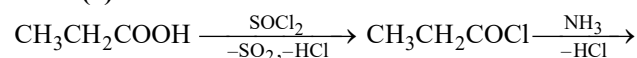


$$-0.4 \times 3 + 0.6 \times 2 = 0$$

39. (1)

Dichlorocarbene $\Rightarrow : \text{CCl}_2$

40. (4)



41. (3)

+M & +I effect increases the basic strength of aniline and vice versa.

In the given compounds, $-\text{NO}_2$ has -M & -I characteristics whereas $-\text{CH}_3$ has +M & +I characteristics.

42. (1)

During denaturation of proteins secondary and tertiary structures are destroyed but primary structure remains intact.



43. (1)

A compound which acts as a reducing agent because of the presence of either ketoses or aldoses group forms a reducing sugar. All monosaccharides come under reducing sugars. Disaccharides which have aldehydic and ketonic group free, act as reducing sugars e.g., maltose and lactose.

44. (1)

$$\begin{aligned}\Delta T_b &= i K_b m \\ &= 2 \times 0.51 \times 0.1 \\ &= 0.102^\circ\text{C}\end{aligned}$$

$$\begin{aligned}\text{Hence, Boiling Point} &= 100^\circ\text{C} + \Delta T_b \\ &= 100^\circ\text{C} + 0.102^\circ\text{C} \\ &= 100.102^\circ\text{C}\end{aligned}$$

45. (4)

$$\begin{array}{l} A(g) \rightarrow B(g) + C(g) \\ \text{Initial: } 10 \quad 0 \quad 0 \\ \text{Final: } 10 - x \quad x \quad x \\ 10 - x + x + x = 12 \quad (\text{given}) \\ 10 + x = 12 \\ x = 2 \end{array}$$

For a 1st order reaction;

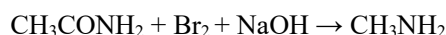
$$\begin{aligned}k &= \frac{2.303}{t} \log \frac{P_0}{P_0 - x} \\ &= \frac{2.303}{20} \log \frac{10}{10 - 2} \\ &= \frac{2.303}{20} \log \frac{10}{8} \text{ min}\end{aligned}$$

46. (4)

Vitamin B group is a water-soluble vitamin. Also, vitamin C is a water-soluble vitamin, whereas Vitamin A, D, E and K are fat soluble vitamins.

47. (1)

This is an example of Hoffmann bromamide reaction.



48. (3)

Freshly prepared glucose solution gets equilibrated to an unequal mixture of (+)- and (–)-glucose (that is the change in the equilibrium between two epimers, when the corresponding stereocenters interconvert). This phenomenon is called mutarotation.

Cyclic sugars show mutarotation as α and β anomeric forms interconvert.

49. (1)

Priority order of groups attached with chiral carbon: $-\text{OH} > -\text{COOH} > -\text{CH}(\text{OH})\text{COOH} > -\text{H}$

50. (1)

Complexes which have only one type of ligands are called homoleptic complexes.

