

CBSE Board
Class XII Chemistry
Sample Paper - 9

Time : 3 Hrs

Total Marks: 70

1. All questions are compulsory.
2. Question nos. **1 to 8** are very short answer questions and carry 1 mark each
3. Question nos. **9 to 18** are short answer questions and carry 2 marks each.
Use of calculator is not permitted.
4. Question nos. **19 to 27** are also short answer questions and carry 3 marks each
5. Question nos. **28 to 30** are long answer questions and carry 5 marks each
6. Use log tables if necessary, use of calculators is not allowed.

Q.1 How will you prove that all the carbon atoms of glucose are in a straight chain?

Q.2 How will you prepare hexan-3-one from propan-1-ol?

Q.3 Why is thionyl chloride considered as the best reagent to convert alcohol into alkyl chlorides?

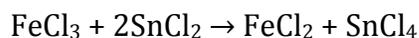
Q.4 Define the following:

- i. Unit cell
- ii. Space lattice

Q.5 Name the most symmetrical and most unsymmetrical primitive unit cell.

Q.6 Why the slowest step is called the rate determining step?

Q.7 For the reaction



The rate law is:

$$\text{Rate} = k [\text{FeCl}_3] [\text{SnCl}_2]^2$$

What is the order and molecularity of the reaction?

Q.8 What happens when conc. H_2SO_4 is slowly added to cane sugar?

Q.9 Calculate the packing efficiency in the case of metal crystal for simple cubic unit cell with the assumption that atoms are touching each other.

Q.10 Ethanol and water solution show positive deviation from Raoult's law. Explain in terms of differences in the structure / polarity of the two components.

Q.11 Explain the mechanism of enzyme catalysis.

Q.12 By giving an example prove the selectivity of a catalyst.

Q.13 Why does sulphur in vapour state exhibit paramagnetic behaviour?

Or

Draw the structures of

- (i) Phosphinic acid
- (ii) Pyrophosphoric acid

Q.14 Write short note on

- (i) Kolbe's reaction
- (ii) Hydroboration

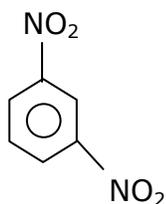
Q.15 Account for the following:

- (i) Alcohols with three or less carbons are water- soluble while alcohols with five or more carbons are insoluble.
- (ii) t - Butanol is more volatile than n - butanol.

Q.16. Give a chemical test to distinguish between propanamine and butan-2-amine

Q.17 Name the following compounds according to the IUPAC system:

i.



ii. H_3C —

Q.18 Arrange the hydrides of group 16 (H_2O , H_2Se , H_2Te , H_2S) in order of increasing

- a. boiling point
- b. acidic strength

Q.19 The rate of reaction triples when temperature changes from 20 to 50°C.

Calculate the energy of activation. ($R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$).

Q.20 Conductivity of 0.00241 M acetic acid is $7.896 \times 10^{-5} \text{ Scm}^{-1}$. Calculate its molar conductivity and if Λ^0_m for acetic acid is $390.5 \text{ S cm}^2\text{mol}^{-1}$. What is its dissociation constant?

Q.21 Describe a method for refining nickel.

Q.22 Give the molecular shapes of XeF_2 , XeF_4 , XeF_6

Q.23 Discuss the nature of bonding in the coordinate entity $[\text{Fe}(\text{CN})_6]^{4-}$ on the basis of valence bond theory.

Q.24 Explain what do you understand by spectrum of antibiotics. Give examples.

Q.25 Bharath went to his grandfather's house in winter this year. As usual he went for fishing. His grandmother told him there will be no fishes in the lake. He noticed that it was more difficult to find fishes in winter. The fishes were deep inside the river. Whereas, in summers they were on the surface and hence he was able to catch fishes.

(a) Why are fishes on the surface in water than in the depth in summer?

(b) What value can be derived from this?

Q.26

(a) What is the difference between nucleoside and nucleotide?

(b) What is a long chain polymers of nucleotides called?

Q.27 Account for the following:

i. Chloroform is stored in dark coloured bottles.

ii. A small amount of ethanol is added to chloroform bottles.

iii. Chloroform is a compound which contains chlorine but it does not give white precipitate with silver nitrate solution.

Or

What are freons? Give some properties of freons.

Q.28 Two elements A and B form compounds having the molecular formula AB_2 and AB_4 . When dissolved in 20 g of benzene, 1.0 g of AB_2 lower the freezing point by 2.3 K, whereas 1.0 g of AB_4 lowers it by 1.3 K. The molal depression constant of benzene is $5.12 \text{ K kg mol}^{-1}$. Calculate the atomic mass of A and B.

Or

The osmotic pressure of a urea solution is 500 mmHg at 10°C . The solution is diluted and its temperature is raised to 25°C . It is now found that the osmotic pressure of the solution is reduced to 105.3 mmHg. Determine the extent of dilution of the solution.

Q.29

- (a) Compare the chemistry of lanthanoids and actinoids in terms of electronic configuration, oxidation states and radioactivity.
- (b) What is the reason for the decrease in atomic/ionic size of lanthanoids along the series?

Or

- (a) Explain giving reasons:
 - i. Transition metals and many of their compounds show paramagnetic behaviour.
 - ii. The enthalpies of atomization of transition metal are high.
 - iii. The transition metal generally form coloured compounds.
- (b) What are the equivalent masses of KMnO_4 in:
 - i. neutral
 - ii. Acidic medium

Q.30

- (a) Why is benzoic acid a stronger acid than phenol?
- (b) How will you bring about the following conversions in not more than two steps?
 - i. Benzoic acid to benzaldehyde
 - ii. Propanoic acid to prop-2-en-oic acid
 - iii. Bromobenzene to 1 - phenyl ethanol

Or

Identify compounds A to E in the following reactions.

