CBSE Board
Class XII Chemistry
Sample Paper - 6

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.

Q1: Which of the two: absorption or adsorption is a surface phenomenon?

Q2: Write the IUPAC name of isomer $[Co(NH_3)_5NO_2]Cl_2$.

Q3: Write the IUPAC name of the compound given below:
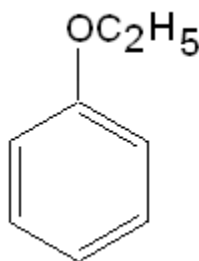
Q4: Give a chemical test to distinguish between benzaldehyde and benzoic acid.

Q5: Why do amines behave as nucleophiles?

Q6: Which type of linkage is responsible for the primary structure of proteins?

Q7: What are biodegradable polymers?

Q8: Name the sweetening agent used in the preparation of sweets for a diabetic Patient?

Q9: Calculate the boiling point of a solution containing 0.456 g of camphor (M.M. = 152) dissolved in 31.4 g of acetone (boiling point = 56.30°C) if molal elevation constant per 100 g of acetone is 17.2°C.

Q10: Write the cell reactions which occur in lead storage battery when the battery is in use.

Q11: Differentiate between lanthanoids and actinoids by giving two points of differences?

Q12: Explain hydrate isomerism. Give an example

Q13: An element E crystalllises in body centred cubic structure. If the edge length of the cell is 1.469×10^{-10} m and the density is 19.3 g cm^{-3}, calculate the atomic mass of this element.

OR

Q13. Potassium crystallizes in bcc lattice. What is the number of unit cells in 3.9 g of K? Atomic Mass of K = 39u

Q14: An element has bcc structure with cell edge of 288 pm. Density of the element is 7.2 g/cm^3. Calculate the number of atoms present in 208 g of element.

Q15:
   (a) Write the name and the structure of the monomer of natural rubber?
   (b) The presence of benzoquinone inhibits the free radical polymerization of vinyl derivative.

Q16: What are detergents? How are they classified?

Q17: Write the structures of
   (a) 1-Chloro-4-ethylcyclohexane
   (b) 4-tert-butyl-3-iodoheptane

Q18: Treatment of alkyl chlorides with aqueous KOH leads to formation of alcohols but in presence of alcoholic KOH, alkenes are formed as major products. Explain.

Q19: What are non – ideal solutions? Explain why non – ideal solution deviates from Raoult's law.

Q 20: When a certain conductivity cell was filled with 0.1 M KCl, it has a resistance of 85 Ω at 25° C. When the same cell was filled with an aqueous solution of 0.052 M unknown electrolyte, the resistance was 96 Ω. Calculate the molar conductivity of the unknown electrolyte at this concentration.

(Specific conductivity of 0.1 M KCl = 1.29 x 10^{-2} Ω^{-1} cm^{-1})

Q 21: An innovative washer woman while washing a copper miner's clothes found that sand and similar dirt particle fell to the bottom, while the ore particles stuck to the soapsuds and came to the top. The washer woman discussed this matter with a client who was a chemist.

(a) What is the reason for this observation?

(b) What value do you get from this episode?

Q 22:

(a) What are the two types of emulsions and how do they differ from one another? Give one example of each.

(b) Which one of the following electrolytes is most effective for the coagulation of $Fe(OH)_3$ sol and why?

NaCl, Na_2SO_4, Na_3PO_4

Q 23:

1. Bond dissociation energy of F_2 is less than that of Cl_2. Why?

2. Oxygen is a gas while sulphur is a solid. Why?

3. Which compound of Xe is isostructural with IF_5? What is the shape of the molecules?

Q 24:

1. What chemical change take place when:

(a) MnO_2 is fused with KOH in air.

(b) pH of a chromate solution is progressively lowered.

2. How would you account for increasing oxidizing power in series?

$VO_2^+ < Cr_2O_7^+ < MnO_4^-$

OR

Q.24

1. Why are Mn^{2+} compounds more stable than Fe^{2+} towards oxidation into their +3 oxidation state?

2. Zn, Cd and Hg are normally not regarded as transition elements. Explain

Q25: Write equations to prepare XeF_2, XeF_4 and XeF_6

Q 26: What do you understand by replication by DNA? How does DNA differ from RNA structurally?

Q 27: Write the steps and conditions to carry out the following conversion: Phenol to benzoic acid.

Q 28:

Explain given reason each of the following:

1. Fluorine exhibits only -1 oxidation state whereas other halogens exhibit positive oxidation states also such as +1,+3,+5 and +7.

2. H_2S is less acidic than H_2Te.

3. Nitrogen does not form pentachloride but phosphorus forms.

4. SF_6 is well known but SCl_6 is not known.

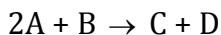5. HCl when reacts with finely divided iron to form ferrous chloride and not ferric chloride.

OR

Q 28:

Complete the reactions:

$$1. (NH_4)_2Cr_2O_7 \xrightarrow{\text{Heat}}$$
$$2. (NH_4)_2SO_4 + 2NaOH \rightarrow$$
$$3. 3NO_2(g) + H_2O(l) \rightarrow$$
$$4. P_4 + 20HNO_3(\text{conc.}) \rightarrow$$
$$5. PbS(s) + 4O_3(g) \rightarrow$$

Q29. The following rate date were obtained at 300 K for the reaction

$2A + B \rightarrow C + D$

Experiment No.	[A] mol L^{-1}	[B] mol L^{-1}	Rate of formation of D mol L^{-1} min^{-1}
1.	0.1	0.1	7.5 x 10^{-3}
2.	0.3	0.2	9.0 x 10^{-2}
3.	0.3	0.4	3.6 x 10^{-1}
4.	0.4	0.1	3.0 x 10^{-2}

Calculate the rate of formation of D when [A] = 0.8 mol L^{-1} and [B] = 0.5 mol L^{-1}.

OR

Q29.

(a) A first order reaction is 15% completed in 23 minutes. How long will it take to complete 60%?

(b) What is the significance of rate constant in a rate law?

Q30.Give reasons for the following:

1. Aliphatic aldehydes do not show position isomers. Why?

2. Why do you expect benzaldehyde to be less or more reactive in nucleophilic addition reactions than propanal? Explain

3. Why do aldyhydes and ketones have high dipole moment?

4. Boiling points of aldehydes and ketones are higher than those of hydrocarbons of comparable molecular mass?

5. The order of reactivity in nucleophilic addition reaction for some aldehydes and ketones is given below. Explain why such an order is observed? Ethanal> Propanal >Propanone >Butanone

OR

Q30.

(a) How are the following conversions carried out? (Write reactions and reaction conditions only).

1. Propanoic acid to 1 – propanol
2. Propanone to 4-Methyl-3-en-2-one
3. Benzyl alcohol to phenylethanoic acid

(b) Describe the following with an example for each:

1. Aldol condensation
2. Decarboxylation reaction