CBSE Board
Class XII Chemistry
Sample Paper - 1

Time : 3 Hrs Total marks : 70

(a) All questions are compulsory.
(b) Marks for each question are indicated against it. Question 26 is a value based question carrying four marks.
(c) Question nos. 9 to 18 are short answer questions and carry 2 marks each. Use of calculator is not permitted.
(d) Question nos. 19 to 27 are also short answer questions and carry 3 marks each
(e) Question nos. 28 to 30 are long answer questions and carry 5 marks each
(f) Use log tables if necessary, use of calculators is not allowed.

Q 1: What are the physical states of dispersed phase and dispersion medium of a cloud?

Q 2: A compound contains A atoms at the corners and B at centers of all faces. What is the formula of the compound?

Q 3: Name the process used for concentration of zinc blende (ZnS) ore.

Q 4: An electrolyte A_3B_2 is 25% ionized. What will be the van't Hoff factor?

Q 5: What is the basicity of orthophosphoric acid?

Q 6: Arrange the following in increasing order of reactivity towards alcohols:
HCl, HBr, HI.

Q 7: Why is nitrogen molecule less reactive than phosphorus molecule?

Q 8: Which of the two: aldehydes or ketones, is more reactive towards nucleophilic addition reactions and why?

Q 9: Calculate the vapour pressure lowering of water when 5.67g of glucose($C_6H_{12}O_6$) is dissolved in 25.23 g of water at 25°C. The vapour pressure of water at 25°C is 23.8 mmHg. What is the vapour pressure of the solution?

Q 10:
(a) How is zirconium purified?
(b) Name a stationary phase used in chromatography.

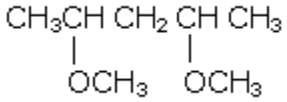
Q 11: Explain the following terms.
(a) Essential amino acids (b) Denaturation of proteins

Q 12:
Which of the two is more acidic and why? p-nitrophenol or p-methoxyphenol.

OR

What happens when:
(i) Phenol reacts with Br_2 in CS_2 at 273K
(ii) Phenol reacts with conc. HNO_3

Q 13: Give IUPAC name of following compounds.
(i) $CH_3\ CH{=}CH\ CH_2\ CH\ (OH)\ CH_3$
(ii)



Q 14:
(i) Convert benzamide to toluene.
(ii) Write the name of reactants, reagents and products involved in conversion of nitrobenzene to m-bromoaniline.

Q 15: An organic compound A (C_3H_5N) on boiling with alkali gives ammonia and sodium salt of an acid B ($C_3H_6O_2$). Upon reduction, A gives C (C_3H_9N) which on treatment with nitrous acid gives D (C_3H_8O). Identify A, B, C and D. give all equations involved.

Q 16: Give two points of difference between DNA and RNA.

Q 17: 1M aqueous solution of a solute is more concentrated than 1m solution. Why?

Q 18: The reaction: $2NO_2 \longrightarrow 2NO + O_2$
has an activation energy of 110 $kJmol^{-1}$. At 400^0C, the rate constant is $7.8mol^{-1}Ls^{-1}$. What is the value of rate constant at 430^0C?

Q 19:
(i) Which type of defect is shown by ionic substances in which the anion and cation are of almost similar sizes?
(ii) What is the difference between semiconductors obtained by doping Si with Al and with P?
(iii) What is the difference between ant ferromagnetic and ferromagnetic substances? What is the reason behind this difference?

Q 20:

The decomposition of Cl_2O_7 at 400K in gas phase to Cl_2 and O_2 is a first order reaction.

(i) After 55s at 400K, the pressure of Cl_2O_7 falls from 0.062 to 0.044 atm. Calculate the rate constant.

(ii) Calculate the pressure of Cl_2O_7 after 100s of decomposition at this temperature.

Q 21:

(i) Why are deltas formed at places where river meets sea?

(ii) List two characteristics of catalysts.

(iii)(iii)What are macromolecular colloids? Give an example.

OR

Explain the following terms:

(i) Electrophoresis

(ii) Coagulation

(iii)Emulsions

Q 22. Complete the equations.

(i) $I_2 + H_2O + Cl_2 \rightarrow$

(ii) $P_4 + SOCl_2 \rightarrow$

(iii) $(NH_4)_2Cr_2O_7 \xrightarrow{Heat}$

Q 23. When conc. H_2SO_4 is added to an unknown nitrate salt contained in a test tube, a brown gas, A, was evolved. The brown fumes intensified when Cu turnings were added to the test tube. On cooling the gas changed to a colourless gas, B.

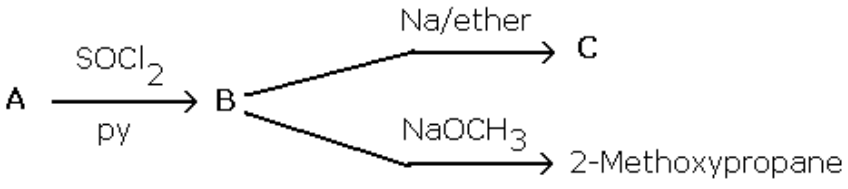
(i) Identify the gases A and B

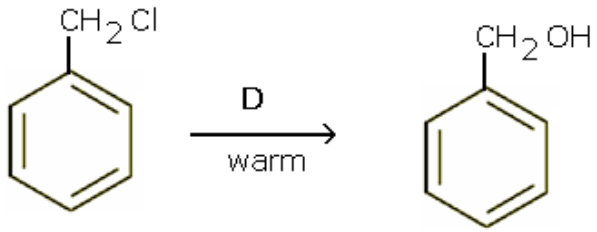
(ii) Give all the equations involved.

Q 24.

(i) Give chemical test to distinguish between chlorobenzene and benzyl chloride.

(ii) Identify A, B, C and D:





Q 25. Shyam owns a shop and sells electrical switches. His friend wants to buy cheap switches so he asks for PVC made switches and not the expensive Bakelite switches. But, Shyam suggested him to take the expensive Bakelite switches. Why? What are the values associated this case (at least two)?

Q 26.

(i) Name the forces are involved in holding the drugs to the active site of enzymes?
(ii) Name the drug used for treatment of typhoid. What type of drug it is?
(iii) What are the consequences of using non-biodegradable detergents?

Q 27.

(i) Give IUPAC name of $K_3[Cr(C_2O_4)_3]$
(ii) What is the number of unpaired electrons in $[CoF_6]^{3-}$ and $[Co(NH_3)_6]^{3+}$?
(iii) Name the isomerism exhibited by following pair of compounds.
$[Co(en)_2(H_2O)Cl]Cl_2$ and $[Co(en)_2Cl_2]Cl.H_2O$]

Q 28.

(i) Name two transition elements which show +1 oxidation state.
(ii) Name the transition element which does not exhibit variable oxidation state.
(iii) Transition elements show catalytic properties. Why?
(iv) Explain why Cu^+ ion is not stable in aqueous solutions?

OR

(i) Write steps involved in the preparation of
(a) Na_2CrO_4 from chromite ore and
(b) K_2MnO_4 from pyrolusite ore
(ii) What is the effect of increasing pH on $K_2Cr_2O_7$ solution?
(iii) Draw the structure of dichromate ion indicating the bond angles and bond lengths.

Q 29. The e.m.f of the cell reaction,

$3Sn^{4+} + 2Cr \rightarrow 3Sn^{2+} + 2Cr^{3+}$ is 0.89 V.

Calculate

(a) ΔG^θ for the reaction.
(b) Equilibrium constant for the reaction relating to
(i) ΔG^θ and (ii) E^θ_{cell}

OR

Given:

$Cu^{2+} + 2e^- \rightarrow Cu \quad E^\theta = +0.34$ V

$Ag^+ + e^- \rightarrow Ag \quad E^\theta = +0.80$ V

(a) Write the cell reaction.
(b) Construct the galvanic cell.
(c) For what concentration of Ag^+ ions will the emf of the cell be zero at 25°C, if the concentration of Cu^{2+} is 0.01 M?

Q 30.

(a) Ethanol reacts with acetic acid in the presence of conc. H_2SO_4 to give a sweet smelling substance. Give the equation involved in the reaction.

(b) Write a note on

(i) Rosenmund's reduction

(ii) Hell Volhard Zelinsky reaction

OR

(a) Complete the equations:

(i) $CH_3CH_2COOH \xrightarrow{NH_3} A \xrightarrow{Br_2/KOH} B$

(ii) $(CH_3)_2C{=}O \xrightarrow[a.\ \text{dil } OH^-]{\text{i. HCN}} X \xrightarrow{H_2/Ni} Y$

(iii) $C_6H_5CHO + CH_3COCH_3 \longrightarrow C + D$

(b) Semicarbazide contains two NH_2 groups but only one participates in reaction with carbonyl compounds. Why?

(c) Which of the two will give yellow precipitate with iodine and sodium hydroxide? Pentan-2-one or pentan-3-one