

CLASS XII

SAMPLE PAPER

CHEMISTRY

Time:3hrs

MM:70

General instructions:

All questions are compulsory.

Marks for each question are indicated against it.

Questions number 1 to 8 are very short –answer questions, carrying 1 mark each. Answer these in one word or about one sentence each.

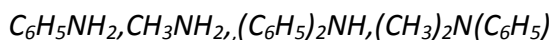
Questions number 9 to 18 are short –answer questions, carrying 2 marks each. Answer these in about 30 words each.

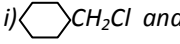

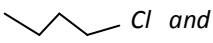

Questions number 19 to 27 are short –answer questions, carrying 3 marks each. Answer these in about 40 words each.

Questions number 28 to 30 are long-answer questions of 5 marks each. Answer these in about 70 words each.

7 Use log tables, if necessary. Use of calculators is not permitted

- | | | |
|----|---|---|
| Q1 | Calculate the packing fraction of simple cubic? | 1 |
| Q2 | Define the term hydrophilic colloid. | 1 |
| Q3 | Define froth floatation method? | 1 |
| Q4 | Why is H_2S is more acidic than H_2O ? | 1 |
| Q5 | Give the I.U.P.A.C.name of the following compound.
$H_2C=C(CH_3)CH_2Br$ | 1 |
| Q6 | Write the structural formula of 4-oxo pentanal. | 1 |
| Q7 | Arrange the following compounds in increasing order of basic strength in their aqueous solutions. | 1 |



- Q8 Write the monomers used for getting the following polymer . 1
 i) Teflon ii) Dacron
- Q9 A reaction is first order in A and second order in B. How is the rate of reaction affected if the concentration of this reaction is 2
 i) Doubled
 ii) Reduced to half
- Q10 Explain 2
 (i) extraction of Ti
 (ii) Zone refining
- Q11 i) Draw the structure of $(HPO_3)_3$ molecule. 2
 ii) Why H_3PO_3 is dibasic acid ?
- Q12 i) Write the method of preparation of Phosphine gas from P_4 . 2
 ii) How is O_3 estimated quantitatively?
- Q13 i) Discuss about the solution shows positive deviation from ideal solution. 2
 ii) Define the term van't Hoff factor.
- Q14 Which one in the following pairs of substances undergoes S_N2 substitution reaction faster and why? 2
- i)  and 
- ii)  and 
- Q15 Complete the following reactions: 2
- i) $CH_3CH=C(CH_3)_2 + HBr \xrightarrow{\text{peroxide}} ?$
- ii) $CH_3CH_2CH_2Cl + NaI \xrightarrow{\text{acetone and heat}}$
- Q16 Explain the following : 2
 a) Denaturation of protein.
 b) Two strands of DNA are not identical but complementary to each other. Explain this statement.
- Q17 Why vitamin A and Vitamin C essential to us ? Give important sources. 2
- Q18 What is a biodegradable polymer? Write the monomer of Nylon 6 and Neoprene. 2

Q19 If the radius of Copper atom is 127.8 pm and density of copper metal is 8.95 g/cm^3 , is the copper unit cell a face centred cubic, a body centred or simple cubic structure. (Given : At. mass of Cu=63.5, $N_A=6.022 \times 10^{23}$) 3

Q20 Determine the amount of CaCl_2 dissolved in 2.5 liter of water such that its osmotic pressure is 0.75 atm at 27°C , assuming that it is completely dissociated. (Given: At. mass of Ca=40 u, Cl=35.5 u) 3

Q21 For a first order reaction, show that time required for 99% completion of a first order reaction is twice time the time required for the completion of 90%. 3

or

The reaction between A and B is first order with respect to A and zero order with respect to B. Fill in the blanks in the following table.

Exp.	$[A] / \text{mol L}^{-1}$	$[B] / \text{mol L}^{-1}$	Initial Rate $\text{Mol L}^{-1} \text{min}^{-1}$
01	0.1	0.1	2.0×10^{-2}
02	-	0.2	4.0×10^{-2}
03	0.4	0.4	-
04	-	0.2	2.0×10^{-2}

Q22 i) Why heat of chemisorption is always more than that of physisorption ? 3
ii) Define activity of catalyst.

iii) Define an emulsion with one example.

Q23 i) Bleaching action of Cl_2 is permanent but not in case of SO_2 . 3

ii) $\text{R}_3\text{P}=\text{O}$ is known while $\text{R}_3\text{N}=\text{O}$ is not known.

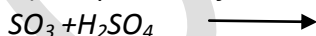
iii) What happens when H_3PO_3 is heated.

Or

i) SF_4 is easily hydrolysed where as SF_6 is not easily hydrolysed.

ii) How XeF_4 can be prepared?

iii) Complete the following reaction



Q24 For the complex $[\text{Fe}(\text{H}_2\text{O})_6]\text{Cl}_2$, identify 3

i) the oxidation number of iron,

ii) the hybridization and shape of complex,

iii) the number of solvate isomers,

- iv) name of complex,
 v) the magnetic moment of iron.
 vi) whether it can show optical isomerism.
- Q25 i) Explain the mechanism of acid catalysed dehydration of ethanol forming ethene. 3
 ii) Convert methanal to Ethanol by using Grignard's reagent.
 iii) Write the reaction between phenol and Br_2 (aq).
- Q26 Giving an example for each describe the following reaction. 3
 i) A coupling reaction
 ii) Kolbe's reaction
 iii) Aldol condensation
- Q27 i) Write the difference between antiseptic and disinfectants with one example in each. 3
 ii) What is non ionic detergent.
- Q28 i) Transition metal compounds generally act as catalyst. (give reason) 5
 ii) Discuss the lanthanoid contraction.
 iii) $E^0 \text{Mn}^{3+}/\text{Mn}^{2+}$ has higher positive value than $E^0 \text{Cr}^{3+}/\text{Cr}^{2+}$ (Atomic number $\text{Cr}=24, \text{Mn}=25$)
 iv) How KMnO_4 can be prepared from pyrolusite ore?
 v) Why do the transition elements form coloured compounds? Explain.
 vi) Write the reaction between KMnO_4 and FeSO_4 in acidic medium.

Or

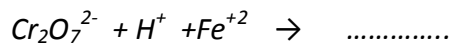
Account for the following : (i) Out of the ions Co^{2+} , Sc^{3+} and Cr^{3+} which one would give coloured aqueous solutions and why ?

(ii) Explain why chromium is a typical hard metal while mercury is a liquid.

(iii) Why in permanganate ion, there is a covalency between manganese and oxygen ?

(iv) Why do the transition elements form interstitial compounds?

(v) Complete the given reaction :

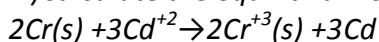


Q29 i) Write the anode and cathode reaction of lead storage battery.

5

ii) Define the molar conductivity .

iii) Calculate the equilibrium constant for the reaction



$$[E^0 \text{Cr}^{3+}/\text{Cr} = -0.74 \text{ V and } E^0 \text{Cd}^{2+}/\text{Cd} = +0.40\text{V}]$$

Or

(i) State Kohlrausch's law.

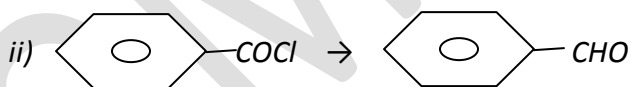
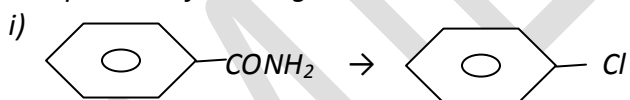
(b) Write down the reactions involved in the working of a $\text{H}_2\text{—O}_2$ fuel cell.

(c) A solution of $\text{Ni}(\text{NO}_3)_2$ is electrolysed between platinum electrodes using a current of 5.0 amperes for 20.0 minutes. What mass of Ni is deposited at the cathode.

$$[\text{At. Wt. Ni} = 58.7]$$

Q30 Complete the following reaction.

5



iii) Distinguish between the following by suitable chemical test

a) Phenol and benzoic acid

b) Benzaldehyde and aniline

Or

i) An organic compound with the molecular formula $\text{C}_9\text{H}_{10}\text{O}$ forms 2,4-DNP derivative, reduces Tollen's reagent and undergoes Cannizzaro reaction .On vigorous oxidation it gives 1,2-benzenedicarboxylic acid. Identify the organic compound.

ii) Arrange the following acid in increasing order of acidity:

$\text{CH}_3\text{CH}_2\text{CH}(\text{Br})\text{COOH}$, $\text{CH}_3\text{CHBrCH}_2\text{COOH}$, $(\text{CH}_3)_2\text{CHCOOH}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$

III) Convert toluene to benzaldehyde.

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