SAMPLE PAPER-04
CHEMISTRY (Theory)
(Questions)
Class – XII

Time allowed: 3 hours Maximum Marks: 70

General Instructions:

a) All the questions are compulsory.
b) There are **26** questions in total.
c) Questions **1** to **5** are very short answer type questions and carry **one** mark each.
d) Questions **6** to **10** carry **two** marks each.
e) Questions **11** to **22** carry **three** marks each.
f) Questions **23**is value based question carrying **four** marks.
g) Questions **24**to **26** carry **five** marks each.
h) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and all three questions in five marks each. You have to attempt only one of the choices in such questions.
i) Use of calculators is **not** permitted. However, you may use log tables if necessary.

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1. Give the structure of Propane-1,2,3-tricarbaldehyde.
2. Give the IUPAC name of $C_6H_5 - CH_2 - CH_2COOH$.
3. Identify all the possible monochloro structural isomers expected to be formed on free radical monochlorination of $(CH_3)_2CHCH_2CH_3$.
4. What is prosthetic group? Give its function.
5. Why the hydrolysis of ester is slow in the beginning and becomes faster after sometimes?
6. How is cast iron different from pig iron?
7. Give reasons:
   i. Aldehydes do not form stable hydrates but chloral exists as chloral hydrate.
   ii. Acetic acid can be halogenated in presence of red phosphorus and chlorine but formic acid cannot be halogenated.
8. Give the application of Henry's law on scuba drivers.
9. Explain Frenkel defect.

Or

Silver forms ccplattice and X-ray studies of its crystals show that the edge length of its unit cell is 408.6 pm. Calculate the density of silver (Atomic mass = 107.9 u).

10. Write a note on order of a reaction.
11. Give a short note on:
    a. Reimer – Tiemann Reaction.
    b. Friedel Crafts Reaction.

12. Show that in a first order reaction, time needed for completion of 99.9% is ten times of half-life of the reaction.
13. Complete the following reactions:
    a. $KNO_2 + O_3 \rightarrow$
    b. $KI + O_3 + H_2O \rightarrow$
    c. $HCl + O_3 \rightarrow$
14. Differentiate between rate of reaction and reaction rate constant.
15. Explain the fact that in aryl alkyl ethers the alkoxy group activates the benzene ring towards electrophilic substitution reaction and it also directs the incoming substituents to o- and p-positions in benzene ring.
16.
    i. Why bithional is added to soaps?
    ii. Sulpha drugs work like antibiotics, but are not antibiotics. Comment.
    iii. What type of drug is phenacetin?
17.
    i. Define chelation.
    ii. What is meant by chelating ligand?
    iii. What is denticity?

    Or

    What are cationic complex, anionic complex and neutral complex? Give examples.
18.
    a) Give the sources of lead compounds.
    b) Define the term 'chemotherapy'.
    c) Name the macromolecules that are chosen as drug targets.
19. Write the possible sequences of the tripeptide which on complete hydrolysis gives glycine, alanine and phenylalanine.
20. What are the three ways to control the microbial diseases?
21. Explain pseudo first order reaction with an appropriate example.
22. Explain the term:
    a) Electro-osmosis
    b) Coagulation
23. The use of hydroelectricity is increasing day-by-day. Government is trying to reduce its dependency on thermal power plants

    Now answer the following question

    a. Why Government is trying to reduce its dependency on thermal power plant?
    b. What values are promoted by the use of hydroelectricity?
    c. Suggest two methods to promote above values.
24. Give the cause of lanthanoid contraction.

    Or

    Give five chemical characteristics of lanthanoids.

25. An organic compound (A) with molecular formula C_8H_8O forms an orange-red precipitate with 2,4-DNP reagent and gives yellow precipitate on heating with iodine in the presence of sodium hydroxide. It neither reduces Tollens' or Fehlings' reagent, nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid, it gives a carboxylic acid (B) having molecular formula $C_7H_6O_2$. Identify the compounds (A) and (B) and explain the reactions involved.

Or

Write chemical equations for the following conversions:

i. $CH_3–CH_2–Cl$ into $CH_3–CH_2–CH_2–NH_2$
ii. $C_6H_5–CH2–Cl$ into $C_6H_5–CH_2–CH_2–NH$
iii. Benzyl alcohol to phenylethanoic acid
iv. 4-Methylacetophenone to benzene-1,4-dicarboxylic acid

26. Calculate its resistivity, conductivity and molar conductivity, if the electrical resistance of a column of 0.05 mol L^{-1}NaOHsolution of diameter 1 cm and length 50 cm is 5.55 × 10 ohm.

Or

a) A solution of $CuSO_4$ is electrolysed for 10 minutes with a current of 1.5 amperes. What is the mass of copper deposited at the cathode?
b) What are the observations made in a galvanic cell after the circuit is completed?