SAMPLE PAPER-05
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.

1. Give the IUPAC name of $(CH_3)_3 - C - COOH$.
2. What is meant by protective colloid?
3. Define coagulation value.
4. Give the role of desorption in the process of catalysis.
5. What is an isoelectric point?
6. Explain the term chromatography.
7. Explain the mechanism of dehydration of ethanol.
8. Classify solids based on their conductivities.

Or

Explain anti-ferromagnetism with neat sketch.

9. Name the reagents used in the following reagents:
   i. Conversion of Benzyl alcohol to benzoic acid.
   ii. Dehydration of propan-2-ol to propene.
   iii. Oxidation of a primary alcohol to carboxylic acid.
   iv. Oxidation of a primary alcohol to aldehyde.
10. Differentiate the solutions having positive deviation from ideal behaviour and the solutions having negative deviation from ideal behaviour.
11. Write a note on the following with an example each:
    i. Williamson synthesis of ether.

ii. Kolbe's reaction.

12. Write a note on:
    i. Stephen Reaction
    ii. Gatterman – Koch Reaction
13. Answer the following:
    i. Give an example of an organometallic compound having sandwich structure.
    ii. Why metal carbonyls are called organometallics?
    iii. Give an example of a metal carbonyl having metal-metal bond.

Or

Explain using crystal field theory, whyhexaaquomanganese (II) ion contains five unpaired electrons, while the hexacyano ion contains only one unpaired electrons?

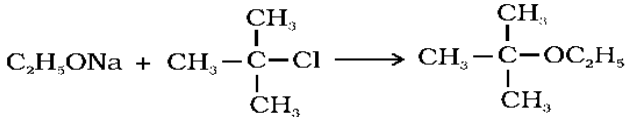
14. Write a short note on Tyndall effect and its cause.
15. Give a short note on:
    i. Friedel Crafts Acylation
    ii. Clemmensen Reduction Reaction
16. Give reasons:
    i. Aldehydes and ketones have lower boiling points than corresponding alcohols and acids.
    ii. Hydrazones of acetaldehyde are not prepared in highly acidic medium.
17. Under what conditions VantHoffs factor 'i' is equal to unity and less than one and greater than one?
18. Explain Brownian movement.
19. Give the application of colloids in electrical precipitation of smoke.
20. Give reasons:
    i. HI is better reagent than HBr for cleavage of ether.
    ii. Highly branched carboxylic acids are less acidic than unbranched acids.
21. Give reason: Phosphorus has more tendency for catenation than nitrogen.
22. Give the reason for the following:
    a. Ethyl iodide undergoes $S_N 2$ reaction faster than ethyl bromide
    b. $(\pm)$ 2-Butanol is optically inactive.
    c. C – X bond length in halobenzene is smaller than C – X bond length in CH_3 – X.
23. Sara went to market to buy fruits and vegetables. The vendor put the fruits and vegetables in the polythene bag but Sara ask the vendor to put the things in the jute bag which he carried with him.
    Now answer the following question
    a. Why did Sara refuse to use polythene bags?
    b. As a student of chemistry why would you advocate the use of jute bags instead of polythene bags? Which values are promoted through the use of jute bag?
    c. Suggest two activities to promote these activities
24. Convert the following:
    a. Toluene to benzaldehyde.

b. Ethanal to but-2-nal.

c. Propanone to 4-methylpent-3-en-2-one.

Or

The following is not an appropriate reaction for the preparation of tert-butyl ethyl ether.



i. What would be the major product of this reaction?

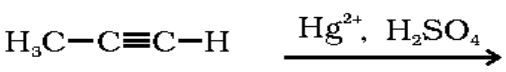
ii. Write a suitable reaction for the preparation of t-butylethyl ether.

25. Give the mechanism of nucleophilic addition reactions.

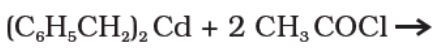
Or

Complete the reactions:

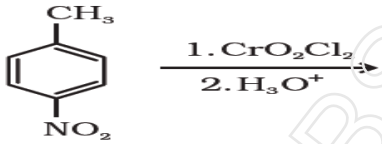
a.



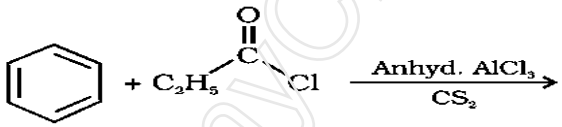
b.



c.



d.



26.

a) Can lanthanum ion exist in +4 oxidation state? Justify.

b) Why europium (II) more stable than cerium (II).

c) Explain the chemistry of all lanthanoids is so identical.

Or

a) Differentiate actinoids and lanthanoids [6 points].

b) Give similarities between actinoids and lanthanoids [4 points]