19. (a) Explain isomerization reaction using TiO_2.

Or

(b) Discuss (i) polymerization reaction (ii) substitution reaction. $(2\frac{1}{2} + 2\frac{1}{2})$

20. (a) Explain the use of transferase in biocatalytic reactions of amino acid.

Or

(b) Write a note on covalent catalysis.

PART C — (3 × 10 = 30)

Answer any THREE questions.

21. Explain the various types of adsorption isotherms. (10)

22. Discuss :

(a) Fischer-Tropsch synthesis.

(b) Partial oxidation of n-butane to Maleic anhydride.

23. Derive Stern-Volmer equation. (10)

24. Describe photoelectrolysis of water. (10)

25. Illustrate oxidoreductase with examples. (10)

S.No. 6257 **P 22 CHE 3 B**

(For candidates admitted from 2022-2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Chemistry — Elective

CATALYSIS

Time : Three hours Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

I. (A) Multiple choice questions : (5 × 1 = 5)

1. A catalyst affect the rate of reaction by

(a) Increasing it (b) decreasing it

(c) Both (d) None of these

2. The chemical formula of zeolite is

(a) $FeSO_4 \cdot 7H_2O$

(b) $Al_2(SO_4)_3 \cdot 18H_2O$

(c) $Na_2O \cdot Al_2O_3 \times SiO_2 \cdot YH_2O$

(d) Na_2Al_2O

3. Photo chemical reaction is mainly dependent on

(a) Intermolecular collision

(b) Intensity of light

(c) Density

(d) All of these

4. Electro catalyst can be evaluated by its,

(a) Activity (b) Stability

(c) Selectivity (d) All of these

5. Bio-catalytic conversions are

(a) Stereospecific

(b) Stereoselective

(c) Regiospecific

(d) Chemoselective

(B) Fill in the blanks : $(5 \times 1 = 5)$

6. Promoters increases the ———— of a catalyst.

7. The catalyst used in Zigler Natta polymerization is ————

8. Photodegradation increases with ———— in concentration of catalyst.

9. Electro catalyst operates on ———— surfaces.

10. The biological catalyst is named as ————

II. Answer ALL the question : $(5 \times 2 = 10)$

11. Define catalytic poison.

12. What are zeolites?

13. What is phosphorescence?

14. What is an electrochemical cell?

15. State any two uses of enzyme in organic synthesis.

PART B — $(5 \times 5 = 25)$

Answer ALL questions, choosing either (a) or (b).

16. (a) Explain (i) promoters (ii) catalyst deactivation. $(2\frac{1}{2} + 2\frac{1}{2})$

Or

(b) Write a note on chemisorption.

17. (a) Write a note on Phase-Transfer catalysis.

Or

(b) Discuss catalytic reaction of cracking.

18. (a) Discuss the photochemical reaction between $H_2 - Br_2$,

Or

(b) Explain the application of TiO_2 in photodegradation of dyes.