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NY—126—2023

FACULTY OF SCIENCE

M.Sc. (Second Year) (Fourth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

ORGANIC CHEMISTRY

Paper-XXI

(Advanced Organic Chemistry)

(Friday, 8-12-2023) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) *All* questions carry equal marks.

1. Answer the following questions (any *five*) : 15

   (*a*) Discuss factors responsible for enzyme specificity.

   (*b*) Give structure and applications of α-chymotrypsin.

   (*c*) Explain concept of chiral auxillary.

   (*d*) What are free radicals ? Explain rearrangment reaction involving free radical.

   (*e*) Explain with example Asymmetric hydrogenation including BINAP.

   (*f*) Give methods of synthesis of organotitanium reagent.

   (*g*) Explain concept of Acid-Base catalysis.

2. Answer the following (any *five*) : 15

   (*a*) Explain concept of Multifunctional catalysis.

   (*b*) Discuss chemical structure of Pyrodixal Phosphate.(PLP)

P.T.O.

(*c*) Explain with example Acyloin condensation.

(*d*) Explain with examples Addition reaction involving free radicals.

(*e*) Write a note on McMurry reaction.

(*f*) Give structure of Biotin (CO_2 carrier).

(*g*) Give *two* applications of organomagnesium reagent.

3. (A) Explain generation, stability and stereochemical properties of free radicals. 7

Or

Discuss proline catalyzed assymetric reaction.

(B) Write notes on : 8

(*i*) Three point attachment theory.

(*ii*) Substitution reaction involving enzymes.

4. (A) Give introduction, classification and nomenclature of enzymes 7

Or

What is enzyme inhibition ? Explain concept of Reversible and irreversible enzyme inhibition.

(B) Write notes on 8

(*i*) Homolysis and free radical displacement.

(*ii*) Induced fit mechanism.

5. (A) Select correct alternative and complete the sentence : 5

(*i*) The molecules upon which enzymes act are called .....

(*a*) Reagent

(*b*) Substrate

(*c*) Catalyst

(*d*) All of the above

(*ii*) Key and Lock mechanism was given by .....

(*a*) Emil Fischer

(*b*) Koshland

(*c*) Darwin

(*d*) Mendel

(*iii*) Group of enzymes help digest fats in gut is .....

(*a*) Amylase

(*b*) Lipases

(*c*) Maltase

(*d*) Trypsin

(*iv*) Organometallic reagents are .....

(*a*) Strong electrophile

(*b*) Weak eletrophile

(*c*) Strong nucleophile

(*d*) Weak nucleophile

P.T.O.

(*v*) Molecular formula of Proline is .....

(*a*) $C_5H_9NO_2$

(*b*) $C_5H_{10}NO$

(*c*) C_5H_9NO

(*d*) $C_6H_{12}NO_2$

(B) Write short notes on (any *two*) 10

(*i*) Organomagnesium reagent

(*ii*) Hunsdieker reaction

(*iii*) Transition State Theory.