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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2024 ONLY)

SUB CODE 23PCY205

REG.NO.:

N.G.M. COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTER EXAMINATIONS: APRIL 2024

M.Sc. CHEMISTRY **MAXIMUM MARKS: 75**

SEMESTER II **TIME: 3 HOURS**

ORGANIC CHEMISTRY-II ORGANIC REACTIONS AND STEREOCHEMISTRY

SECTION – A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS. (K1)

1.Which reagent is commonly used for the oxidation of primary alcohols to aldehydes?

A. Chromyl chloride B. Lead tetraacetate C. Ozone D. Dioxiranes

2. What does the Stark-Einstein law quantify in photochemistry?

A. Absorption spectrum B. Quantum efficiency C. Rate of reaction D. Energy transfer

3. In the conservation of molecular orbital symmetry, the feasibility of a chemical reaction is determined by:

A. Atomic mass B. Symmetry of molecular orbitals C. Bond dissociation energy D. Molecular weight

4. Ansas compounds are known for their:

A. Axial chirality B. Planar chirality C. Prochirality D. Optical isomerism

5. What is the primary technique used for the determination of the structure of alkaloids?

A. Chromatography B. NMR Spectroscopy C. Mass Spectrometry D. X-ray Crystallography

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Identify a reagent commonly employed for the oxidative cleavage of alkenes.

7. What is the role of photosensitization in photochemistry?

8. Define the Woodward-Hoffman selection rule

9. Explain helicity in the context of optical isomerism of over-crowded molecules.

10.Show the role of Mass Spectrometry in determining the structure of alkaloids.

SECTION – B (5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. a) Explain the mechanism of oxidation using the Dess-Martin reagent, highlighting its advantages and limitations.

(OR)

b) Find the role of Wilkinson catalyst in catalytic hydrogenation reactions, and provide an example.

12. a) Solve the Norrish type I and type II reactions in photoreduction.

(OR)

b) Distinguish between cis and trans isomerization reactions.

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13. a) Illustrate the correlation diagram and the Frontier Molecular Orbital (FMO) approach in the context of cycloaddition reactions.

(OR)

b) Outline the key features of the Cope rearrangement

14. a) Describe the stereochemistry of nitrogen compounds

(OR)

b) Determine the E, Z-notation for configuration of geometrical isomers.

15. a) Demonstrate the general methods of the structure of alkaloids.

(OR)

b) Discuss the structure of morphine

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

(K4 (Or) K5)

16. a) Compare the oxidative capabilities of chromyl chloride and selenium dioxide in organic synthesis.

(OR)

b) Describe the role of hydrazines in organic chemistry, and compare the mechanisms of Clemmensen and Wolff-Kishner reductions.

17. a) Discuss the mechanisms and applications of Barton reaction and the Patterno-Buchi reaction

(**OR)**

b) Demonstrate the mechanism of photooxidation and its significance in organic chemistry.

18. a) Interpret the 4nπ and (4n+2) π systems.

(OR)

b) Summarize the applications of Ene reactions in organic synthesis.

19. a) Discuss the stereoisomerism of cyclic compounds, focusing on aldoximes and ketoximes.

(OR)

b) Elaborate on the conformational aspects of perhydro phenanthrenes

20. a) Infer the synthesis o quinine**.**

(OR)

b) Evaluate the structural elucidation of reserpine.