BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

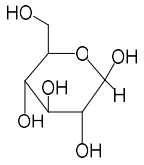
CLASS: IMSc Chemistry **SEMESTER : X**
BRANCH: CHEMISTRY **SESSION : SP/2025**

SUBJECT: CH515 INTERDISCIPLINARY ORGANIC CHEMISTRY

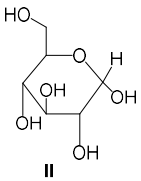
TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Consider the following molecules I and II and answer the subsequent questions:	[5]	1	1



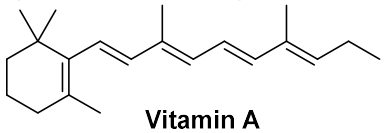
I



II

i) Write their most stable chair conformations with their name.
ii) How can you interconvert them?
iii) Which one is more stable and why?

Q.1(b)	Write a short note on polysaccharides and their types. Write the mechanism of formation of osazone from D-Glucose and phenyl hydrazine.	[5]	1	3
Q.2(a)	How do we distinguish between primary, secondary, and tertiary amines in amino acids or peptides? How does the Zeisel method help identify methoxy groups in peptides or alkaloids? Explain.	[5]	2	2
Q.2(b)	Sketch the Gabriel–Malonic Ester synthesis of amino acids with mechanism. Demonstrate a diagrammatic presentation for the application of electrophoresis in peptide separation.	[5]	2	3
Q.3(a)	Demonstrate the scheme for limonene synthesis from α-terpineol. Elaborate on the structure determination of Nicotine.	[5]	3	4
Q.3(b)	**i)** Write the basic skeleton of Flavanoids. **ii)** What class of terpene is vitamin A? Highlight the isoprene units in it.	[5]	3	4


Vitamin A

Q.4(a)	Mention two differences between thermoplastics and thermosetting plastics. What are conducting polymers? Explain with one application.	[5]	4	3
Q.4(b)	Define the degree of polymerization and polydispersity index (PDI). Differentiate between addition and condensation polymerization.	[5]	3	3
Q.5(a)	Discuss the advantages of supercritical CO_2 as a green solvent. Demonstrate the paracetamol synthesis with a scheme using the green chemistry technique.	[5]	5	3
Q.5(b)	Discuss the significance of TAML catalysts in green chemistry. Explain the "biomimetic synthesis" with a suitable example.	[5]	5	4

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