PB **5251**

Roll No. _____ **Total No. of Pages: 02**

M.Sc. (Semester-IV) Examination - June - 2026
Chemistry
Paper- 4.2 CHEM
Recent Methods of Organic Synthesis
(Common for all Specilizations)

Time Allowed: Three Hours **Maximum Marks: 70**

This question paper contains two sections as under : **Minimum Marks: 28**

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Section-A **Max. Marks-20**

This section will have 10 questions, having 02 questions from each unit with no internal choice. Answer in about 20 words. All questions will have equal marks. (2×10=20)

Section-B **Max. Marks-50**

This section will have 10 questions, having 02 questions from each unit, one question to be attempt from each unit. Words limit approximately 400-500 words. Questions may have sub divisions. All questions will have equal marks. (10×05=50)

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Section-A

1. (i) Differentiate homogeneous and heterogeneous catalysts. **2x10=20**

(ii) What are bio catalysts? Give any two examples.

(iii) Why water is a green solvent?

(iv) What do you mean by chiral ionic liquids? Give any two examples.

(v) In which way microwave assisted synthesis differ from conventional synthesis.

(vi) Explain saponification reaction.

(vii) What is sonochemisty?

(viii) Explain Kolbe reaction.

(ix) Explain the different types of reactors.

(x) What is mass and energy balance.

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Section-B

Unit-I

2. Explain the twelve principles of green chemistry in details. 10

OR

Write short notes on: 3+3+4=10

(i) Phase transfer catalysts.

(ii) Polymer supported reagents.

(iii) Solid acid-base catalysts.

Unit- II

3. Describe the preparation and physiochemical properties of ionic liquids. 6+4=10

OR

Explain the following- 5+5=10

(i) Phase diagram of CO_2

(ii) Synthesis of quinoxalines in green solvents.

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Unit – III

4. Explain the limitation and application of microwave assisted organic synthesis. 4+6=10

OR

Describe the following microwave assisted organic synthesis. 5+5=10

(i) Esterification

(ii) Diels-Alder reaction.

Unit – IV

5. Explain following:- 6+4

(i) Homogeneous and Heterogeneous sonochemistry.

(ii) Ultrasound cavitation. 327

OR

Write short notes on- 3+4+3=10

(i) Hetero-Michael reaction.

(ii) Cathodic reductions

(iii) Sonochemical effect.

Unit- V

6. What do you understand about batch reactors? Explain concept of laboratory and pilot scale organic synthesis. 327 2+4+4=10

OR

How do you produced pharmaceuticals and agrochemicals using vapour phase reactors? Explain by using suitable examples. 5+5=10