

5 MN 60406 B

FOUR YEAR B.Sc. (Honours) DEGREE EXAMINATION,
NOVEMBER/DECEMBER 2025

FIFTH SEMESTER

Chemistry

Paper XIII B – GREEN CHEMISTRY AND NANOTECHNOLOGY

(w.e.f. 2023-24 Regulations)

Time : Three hours

Maximum : 70 marks

(No additional sheet will be supplied)

PART A — (5 × 4 = 20 marks)

Answer any FIVE questions

1. List any four basic principles of Green Chemistry.
2. Give one example each for rearrangement and addition reaction with 100% atom economy.
3. What are the advantages of aqueous-phase reactions in green synthesis?
4. Mention one application each of Heck and Suzuki reactions.
5. State two merits of microwave-assisted reactions over conventional heating.
6. What is Leukart reaction? Mention its green relevance.
7. Write a short note on oxidation of toluene under green conditions.
8. What is the role of catalysts in green synthesis?
9. Give two key features of nanomaterials.
10. Name two methods used for physical synthesis of nanoparticles.

PART B — (5 × 10 = 50 marks)

Answer ALL the following the questions.

11. Define Green Chemistry. Explain its need, goals, and principles with examples.

Or

12. Discuss the evaluation of rearrangement and addition reactions in terms of atom economy. Provide equations to support your answer.

13. Describe green solvent systems with reference to (a) aqueous-phase reactions, (b) solid-supported synthesis.

Or

14. What is the role of green energy in sustainable chemistry? Discuss with suitable examples.
15. Write the apparatus and method for conducting microwave-assisted organic synthesis.

Or

16. Explain Diels–Alder and Cannizzaro reactions from a green chemistry perspective.
17. Outline the green synthesis of (a) Adipic acid (b) Disodium iminodiacetate.

Or

18. Explain microwave-assisted conversion of methyl benzoate to benzoic acid. Also discuss oxidation of alcohols.
19. Discuss classification and chemical properties of nanomaterials.

Or

20. Describe the aerosol method and inert gas condensation techniques used in nanoparticle synthesis.
-