

2022
B.A./B.Sc.
Fifth Semester
 DISCIPLINE SPECIFIC ELECTIVE – 2
CHEMISTRY
Course Code: CHD 5.21
 (Green Chemistry)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Define and explain green chemistry? 5
- (b) Discuss the principles of green chemistry. Which of the 12 principles are used in the BHC company synthesis of ibuprofen? 6
- (c) How is acid rain caused? 3
2. (a) Define atom economy. Explain the rearrangement and elimination reactions in terms of atom economy, among the two reactions state which is more environmentally favourable. 6
- (b) Write a note on pollution prevention hierarchy. 5
- (c) How are chlorofluorocarbons responsible for depletion of ozone? 3

UNIT-II

3. (a) Write a note on water as a solvent for organic reactions. 4
- (b) Explain what you understand by supercritical carbon dioxide. 5
- (c) Explain the importance of selection of starting materials for organic synthesis. 5
4. (a) Give the advantages of microwave techniques in green chemistry analysis with examples. 4
- (b) Discuss the application of CO₂-SCF in food industry. 5
- (c) Explain the comparison of heterogeneous and homogeneous catalysis. 5

UNIT-III

5. (a) State the fourth principle of green chemistry. Elaborate why the need to adopt such principle by citing an example. 1+3
(b) Suggest some strategies to minimise hazardous waste generation. 4
(c) Briefly explain the Flixborough accident by stating the possible cause. Also, mention the lesson learnt for the individual and its final conclusion by the public inquiry report. 2+2+2=6
6. (a) Explain the following terms in the context of designing green processes: 2×3=6
(i) Minimization
(ii) Substitution
(iii) Simplification
(b) Write in detail about the conventional route and greener route for preparation of carbaryl. 4
(c) List the 12 principles which provide a framework for designing new material products. Which may lead to a green chemical manufacturing process? 4

UNIT-IV

7. (a) Write a note on dry cleaning of garments in green chemistry. 4
(b) Define marine biological fouling. Explain the uses of tributyltin (TBT) as antifouling and its adverse effect on the environment. 1+4=5
(c) Give the green synthesis of the following reactions: 5
(i) Hofmann elimination
(ii) Decarboxylation
8. (a) Write a note on the following: 4
(i) Adipic acid
(ii) Catechol
(b) Write the chemical name of PERC. Explain how PERC is employed in dry cleaning and its adverse effects on human being. 5
(c) Give an account on an efficient, green synthesis of a compostable and widely applicable plastic made from corn. 5

UNIT-V

9. (a) Write a note on green chemistry versus environment. 7
(b) What do you understand by combinatorial green chemistry? Explain. 7
10. (a) Explain in detail green chemistry in sustainable development. 7
(b) Write a note on proliferation of solventless reactants. 7
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