

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026**(Regular/Improvement/Supplementary)****CHEMISTRY****GCHE6B12T: ADVANCED AND APPLIED CHEMISTRY****Time: 2 Hours****Maximum Marks: 60****SECTION A: Answer the following questions. Each carries two marks.
(Ceiling 20 marks)**

1. Discuss the stability of lyophilic and lyophobic sols. Which is more stable?
2. Explain the term quantum size confinement.
3. What are fullerenes? Give one application.
4. State the percentage atom economy of a synthesis taking a suitable example.
5. What do you mean by the term molecular recognition?
6. Differentiate between Ab Initio and Semi-empirical methods.
7. What do you mean by prodrugs? Give an example.
8. Comment on mixed fertilizers with an example.
9. Briefly explain the chemistry behind the setting of cement.
10. What is Ajinomoto? Give its structure and use.
11. Define the terms (i) Cetane number (ii) Flash point.
12. What is meant by 'impact factor' of a journal?

**SECTION B: Answer the following questions. Each carries five marks.
(Ceiling 30 marks)**

13. Write a note on the optical and electrical properties of colloids.
14. What do you mean by green synthesis? Explain how green synthesis of ibuprofen can be carried out.
15. Discuss the different Softwares used in computational chemistry calculations.
16. Explain the chemical synthesis of paracetamol and aspirin.
17. Where is the factory Travancore titanium products located? How is TiO_2 manufactured from Ilmenite. Mention the uses of TiO_2 .
18. Discuss the applications of combinatorial synthesis in drug discovery.
19. How are dyes classified according to the mode of application to the fabrics? Explain.

SECTION C: Answer any one question. The question carries ten marks.

20. Explain the various steps involved in the experimental research work.
21. Write short notes on:
 - (a) Saddle point.
 - (b) Refractory materials.
 - (c) Classification of synthetic detergents.

(1 × 10 = 10 Marks)