



Name :

B.Sc DEGREE (CBCS) EXAMINATION, APRIL 2021

Sixth Semester

Choice Based Core Course - CH6CBT02 - NANOCHEMISTRY AND NANOTECHNOLOGY

Common for B.Sc Chemistry Model I, B.Sc Chemistry Model II Industrial Chemistry & B.Sc Chemistry Model III Petrochemicals

2017 Admission Onwards

68141395

Time: 3 Hours Max. Marks: 80

Part A

Answer any ten questions.

Each question carries 2 marks.

- 1. What are nanomaterials? Do they exist in nature?
- 2. How will you synthesize single-walled CNTs?
- 3. What is CVD? What are its advantages?
- 4. How do you prepare self-assembled monolayers on metallic substrates?
- 5. Outline the principle of AFM.
- Give the advantages of SIMS.
- 7. Distinguish between UPES and XPES characterization techniques.
- 8. What is meant by surface plasmon resonance?
- Account for the excellent electrical conductance of carbon nanotubes.
- 10 What is meant by liposome?
- 11 What do you mean by biomimetics?
- 12 How will nanotechnology be used to be benefit the environment?

 $(10 \times 2 = 20)$

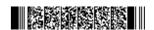
Part B

Answer any six questions.

Each question carries 5 marks.



Page 1/2 Turn Over



- 13. Discuss Moore's laws from the point of view of nanotechnology.
- 14. Classify nanomaterials according to origin. Give examples for each.
- 15. Describe two methods of preparation of fullerenes.
- 16. Compare and contrast SEM and STM.
- 17. Discuss the principle of TEM and ETEM. Evaluate the importance of these techniques in the characterization of nanomaterials.
- 18. Discuss different types of nano-lithographic fabrication techniques used for patterning in the nanoscale region.
- 19. 'Nanomaterials can revolutionize the field of photodetection.' Substantiate the statement.
- 20. Discuss the important applications of nano-catalysis.
- 21. Describe briefly on nanosensors and nanobiosensors.

 $(6 \times 5 = 30)$

Part C

Answer any two questions.

Each question carries 15 marks.

- 22 Discuss the classification of nanomaterials in terms of their chemical composition.
- Outline the fundamental principles of quantum tunnelling. How is it important in STM and AFM techniques? Compare these characterization techniques and discuss their applications in nanoscience and nanotechnology.
- 24. Discuss the electrical, optical and magnetic properties of nanocrystals.
- 25. Discuss the important applications of nanoparticles in nanomedicine.

 $(2 \times 15 = 30)$

