



21101111

QP CODE: 21101111

Reg No :

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.
6. Give the advantages of SIMS.
7. Distinguish between UPES and XPES characterization techniques.
8. What is meant by surface plasmon resonance?
9. 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 benefit the environment?

(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*





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.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Discuss the classification of nanomaterials in terms of their chemical composition.
23. 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.

(2×15=30)

