Turn Over



QP CODE: 24000649



Reg No	:	
Name	:	

## **B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, MARCH 2024 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

4FEDE3F7

Time: 3 Hours

Max. Marks: 80

Part A

Answer any ten questions. Each question carries 2 marks.

- What do you mean by 'nanoscience'? 1.
- What is Moore's law? 2.
- What do you mean by a one-dimensional nanomaterial? Give an example. 3
- Give one method of preparation of a quantum dot. 4.
- What is SEM? How is it important in nanoscience? 5.
- What information can you get by analysing backscattered electrons in a SEM instrument? 6.
- What is non-contact mode in AFM? 7.
- Mention one application of nanocrystals in medical field. 8.
- What is meant by a nano-photodetector? 9.
- What are the important types of nano-catalysts? 10.
- Give two examples for nano-based drug delivery systems. 11
- 12. Name two nanomaterals which finds application in biotechnolgy.

 $(10 \times 2 = 20)$ 

## Part B

Answer any six questions. Each question carries 5 marks.

13. Elaborate on the applications of fullerenes.





- 14. Discuss the chemical vapour deposition method for the synthesis of nanoparticles.
- 15. What are monolayer protected metal nanoparticles? How are they synthesised?
- 16. Briefly describe the fundamental principles and working of SIMS.
- 17. Distinguish between XPES and UPES.
- 18. Write a note on plasmon resonance.
- 19. Discuss the applications of STM and AFM in nanolithography.
- 20. Describe briefly on nanosensors and nanobiosensors.
- 21. Discuss the applications of nanotechnology in medical diagnosis.

(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 and dimensions.
- 23. Outline the fundamental principles of quantum tunnelling. How is it important in STM? What is AFM? Compare STM and AFM and discuss their applications in nanoscience and nanotechnology.
- 24. Discuss electrical and optical properties of carbon naotubes. Discuss important applications of carbon nanotubes.
- 25. Discuss the important applications of nanoparticles in nanomedicine.

(2×15=30)