

2016

**CHEMISTRY**

Paper : CHM 206

**NANOCHEMISTRY**

Full Marks : 40

Time : 1½ hours

*The figures in the margin indicate full marks for the questions*

1. Answer the following : 1 × 5 = 5
  - a. What types of methods are adopted to study the morphology of nanomaterials?
  - b. Who coined the term "Nanotechnology"?
  - c. What type of nanomaterial is used to make the pixels of high definition T.V. monitors?
  - d. Why do nanomaterials have high tensile strength?
  - e. What are quantum wells?
  
2. Answer the following : 2 × 5 = 10
  - a. What is the difference between top-down approach and bottom-up approach in the synthesis of nanomaterials?
  - b. What is the diameter of a bucky ball? How many pentagons and hexagons are there in a bucky ball?
  - c. What are polymeric nanofibres? Explain briefly.

- d. What are donors and acceptors? How deep traps affect the manufacture of semiconductors?
- e. What is the size effect of nanomaterial? Explain briefly.

3. Answer the following questions (any five):

$$3 \times 5 = 15$$

- a. With a neat sketch, explain mechanical milling process for the synthesis of nano particles. Mention advantages and disadvantages also.
- b. What do you understand by Quantum dots? Explain.
- c. What are CNTs? Explain one synthesis of SWNT.
- d. Write a short note on quantum confinement.
- e. Describe any method to study the morphology of nanoparticle.
- f. What are uses of carbon nanotubes?

4. Answer any two of the following:  $5 \times 2 = 10$

- a. What are the general principles of sol-gel processing? Highlight the advantages of electrodeposition for the synthesis of nanoscale materials.
- b. Discuss electrical and optical properties of nano materials.
- c. Discuss the use nano material in synthetic organic chemistry.

41.

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