Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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M.Sc.(Chemistry) (2015 to 2017 Batch E-II) (Sem.–4)

NANOCHEMISTRY

Subject Code : MSCH-411

M.Code : 71679

Time : 3 Hrs. Max. Marks : 100

INSTRUCTION TO CANDIDATES :

1. **Attempt Five questions in all including question no 1 which is compulsory and selecting one each from unit I to IV.**
2. **All questions carry equal marks.**

I. Answer briefly :

(a) Why do the objects in nanoscale cannot be seen by visible light? How do we see them?

(b) What are the characteristic properties of objects in the nanoscale?

(c) Why self assembled monolayers are difficult to study?

(d) What made the discovery of fullerenes possible?

(e) Write applications of carbon nanotubes.

(f) Discuss the importance of nanolithography.

(g) What are the essential features of nanoshell attractive in biology?

(h) What are the advantages of magnetic nanoparticles in nanomedicine?

(i) What are molecular logic gates?

(j) Discuss the term 'bio nanocomposite'.

SECTION-B

UNIT-I

2. What do you mean by 'self assembled monolayers'? Describe the different growth techniques used for monolayers. Discuss their applications.

3. Discuss the importance of chemistry in the emerging field of nanotechnology. Describe how chemical techniques are used for the characterization of nanomaterials.

UNIT-II

4. Describe different chemical wet techniques used for the synthesis of nanomaterials. Discuss their advantages and disadvantages also.

5. Explain various steps involved in growth of semiconductor nano-wires using chemical vapour deposition (CVD) technique.

UNIT-III

6. Describe different scattering techniques used for the characterization of nanomaterials. Discuss dynamic light scattering technique in detail.

7. With a general diagram of Atomic force microscope, explain the function of various components. Discuss how it can be used for characterizing the materials.

UNIT-IV

8. What is the requirement of nanosensor? Discuss which physical properties are used for sensing? Describe nano gas sensor in detail with proper mechanism.

9. Discuss how nanotechnology plays an important role in drug delivery. How it will be more effective and cheaper in comparison to conventional methods?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.