

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I. Write brief notes on following:-

- (a) DNA Origami
- (b) Sol-gel process
- (c) Bio-conjugation
- (d) Lab on a chip
- (e) Nanowires.

(5x2)

**UNIT - I**

- II. Write a note on application of nanoparticles in drug delivery. What are the various top down approaches for the fabrication of nanomaterials? (10)
- III. What is photodynamic therapy? What type of nanomaterials are prepared by sol gel process? What is targeted drug delivery? Explain. (10)
- IV. - Write a brief note on (i) bioassay, and (ii) cellular response to the nanostructured surfaces. What is cellular rejection of nanoparticles? How cellular rejections can be avoided? Explain. (10)

**UNIT - II**

- V. What is DNA molecular therapy? Explain how DNA can be programmed for nanostructured assembly. What is protein nano-array? Briefly explain the construction of a transducer based biosensor. (10)

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(2)

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VI. Explain how viruses are used as a template for the construction of nanoparticle assemblies. Explain the applications of protein nanoarrays. What is tissue engineering? Explain. (10)

VII. What are dendrimers? Explain their role in drug delivery. Briefly explain the techniques to develop scaffolds for tissue engineering. Explain the role of nanoparticles as contrast agents. (10)

x-x-x