

Exam.Code:1034
Sub. Code: 7882

1129
M. E. (Bio-Technology)
Third Semester
Elective – III
ME-BIO-301: Nano-Biotechnology and Nano-Devices

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Answer the following:-
- PDI is defined as_____.
 - What is the importance of measuring zeta potential of a nanoparticle dispersion?
 - SPIONS are repetitively branched molecules. True or False?
 - Carbon nanotubes are used as a contrast agent in MRI. True or False?
 - Mention any one application of virus like nanoparticles
 - SERS stands for_____.
 - Nanolithography is a top down approach to synthesize nanomaterials. True or False?
 - Nanoparticles can induce inflammatory responses similar to pathogens. True or False?
 - The size of the nanoparticles can be determined using_____.
 - Nanorobots are defined as_____.
- (10x1)

UNIT – I

- II. Write a short note on any two:-
- Sol gel process of nanoparticle synthesis
 - Electron beam lithography
 - Applications of nanobiotechnology in medicine
- (5x2)
- III. Draw a labeled diagram of a nanofluidic device and discuss its basic theory and construction. Mention the advantages and disadvantage of the same.
- (10)

P.T.O.

(2)

- IV. a) Discuss any two techniques used in the characterization of nanoparticles. Why is it important to characterize the particle using multiple techniques to obtain reliable results?
- b) Explain the importance of surface functionalization of nanoparticles and how it is done? (2x5)

UNIT - II

- V. a) Write a descriptive note on protein nanoarrays, their construction and applications.
- b) Explain the working of self assembled DNA nanostructures and nanodevices.
- VI. a) Differentiate between single walled and multi-walled carbon nanotubes. Explain any one method of synthesis of carbon nanotubes and mention application of carbon nanotubes in biomedical sciences.
- b) What are dendrimers? Name different types of dendrimers, mention the properties, method of synthesis and applications of dendrimers. (2x5)
- VII. Write a short note on any two:-
- a) Gold nanoparticles
- b) Nanosensors
- c) Quantum dots (2x5)