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Exam.Code:1034

Sub. Code: 7882

1128

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:-

- a) SPR stands for _____.
- b) Nanoparticles may cross blood brain barrier. True or False?
- c) Dendrimers are repetitively branched molecules. True or False?
- d) Carbon nanotubes are used as a contrast agent in MRI. True or False?
- e) The surface to volume ration in nanoparticle is _____.
- f) Surface functionalization may change the overall size and charge of nanoparticles. True or False?
- g) Nano lithography is a top down approach to synthesise nanomaterials. True or False?
- h) "There's Plenty of Room at the Bottom" was a lecture given by _____.
- i) The size of the nanoparticles can be determined using _____.
- j) Nanorobots are defined as _____.

(10x1)

UNIT – I

II. Write a short note on any two of the following:-

- a) Nanoimprint lithography
- b) Electron beam lithography
- c) Hybrid Nanobiodevices

(5,5)

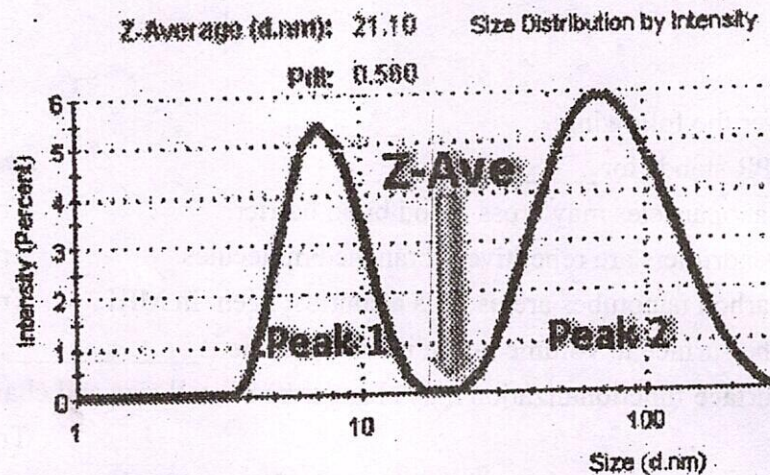
III. What are MEMS systems? Describe the technology including its system components, advantages over the conventional technologies and applications in different fields.

(10)

P.T.O.

(2)

- IV. a) Define bio-functionalization in terms of nanobiotechnology. Enlist the common biofunctional species and their uses.
- b) The following graph is obtained while determining the size of nanoparticles your synthesized. Interpret the graph and explain your interpretation in detail. Is there any drawback of using the current technology.



UNIT - II

- V. Self assembled DNA nanostructures and nanodevices are the future of nanobiotechnology. Justify this statement in light of recent advances and applications in the field. (10)
- VI. a) Explain the techniques for fabrication and construction of three-dimensional scaffolds for tissue engineering.
- b) Mention all the properties that make nanoparticles better than traditional dyes for labeling? What are modifications that can be done in nanoparticles to make them more suitable for labeling purposes? (5,5)
- VII. Write a short note on any two of the following:-
- Gold nanoparticles in health care
 - Virus based nanoparticles
 - Carbon nanotubes
- (5,5)