

Exam.Code:0912
Sub. Code: 6332

2053
B.E. (Biotechnology) Eighth Semester
BIO-815(a): Nanobiotechnology

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) Differentiate between single walled and double walled carbon nanotubes.
- b) What is the importance of chemical modifications of nanostructure?
- c) Mention any two applications of nanoemulsions.
- d) FRET is acronym for _____.
- e) How have nanorobots helped in detection of diseases?
- f) Name any technique to control of motility of the actin/myosin motor system.
- g) Why is cell seeding important for tissue engineering applications?
- h) Name the different types of nanopores.
- i) What is spin coating and how is it done?
- j) What is a Tylor cone? (10x1)

UNIT - I

- II. a) Mention the process of synthesis of carbon nanotubes and enlist any three biomedical applications of carbon nanotubes.
b) Discuss EPR effect. How is nanobiotechnology a boon for cancer treatment? (7,3)
- III. a) Explain the process of formation of focal adhesion plaque when the cell interacts with this surface.
b) "There are various nano-functionalization technologies for biomaterials." Discuss few such technologies in detail. (2x5)

P.T.O.

(2)

- IV. a) What are bucky ball? Elaborate on their method of synthesis and mode of action.
b) Describe synthesis, properties, functionalization and therapeutic applications of dendrimer. (2x5)

UNIT - II

- V. a) Explain the process for creation of linear track to control the movement of molecular motor driven filaments.
b) What are SERS based nanosensors? Describe their basic principle, working and applications. (2x5)
- VI. Describe different techniques for synthesis of biotic and abiotic pores. Give any five applications of nanopores. (10)
- VII. a) Explain the design, manufacturing and programming of a nanorobot for a controlled actuation and target identification in biological system.
b) Write a detailed note on nanopumps, their fabrication and applications. (2x5)

x-x-x