Exam.Code:0912
Sub. Code: 33392

2055

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. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Answer the following:

a) Mention two applications of nanopores.

b) How are naosensors used for live cell imaging?

c) What are nanorobots and how are they used in molecular detection?

d) SARS is an acronym for_____.

e) How are nanopumps fabricated?

f) How are nanoemulsions prepared?

g) Differentiate between single walled and multi walled carbon nanotubes?

h) The repetitive branched nanostructures are called_____.

i) How can you functionalize the nanoparticles?

j) Draw a labelled diagram of a nanoshell. (10x1)

UNIT - I

II. a) Explain fabrication of DNA nanostructure in two and three dimension for therapeutic application.

b) Explain any two methods for synthesis of carbon nanotubes. Give advantages and disadvantages of each method. (2x5)

III. Explain the generation of functional tissue employing three main components of tissue engineering. (10)

IV. a) List the key factors determining the suitability of scaffold for tissue engineering. Elucidate any three scaffold fabrication techniques.

b) Elucidate nanoshell mediated plasmonic photothermal therapy. How is it better than conventional strategies employed for cancer treatment? (2x5)

P.T.O.

UNIT - II

V. Explain various solid state nanopore fabrication techniques. Give applications of nanopores. (10)

VI. a) Explain the design, manufacturing and programming of a nanorobot for a controlled actuation and target identification in biological system.

b) Describe nanopump fabrication using silicon on insulator wafer. (2x5)

VII. Write short note-

a) Temporal and spatial control of molecular motors.

b) MEMS based nanopump. (2x5)

x-x-x