KUMARAGURU
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Register Number:……..

B.TECH DEGREE EXAMINATIONS: NOV / DEC 2014

(Regulation 2009)

Sixth Semester

BIOTECHNOLOGY

BTY204: Nano Biotechnology

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Who coined the term “Nanotechnology”?
   a) Albert Einstein b) Richard Feynmann
   c) Norio Taniguchi d) K. Eric Drexler
2. How much is a nanometer in centimeter scale?
   a) 1×10^{-7}cm b) 1×10^{-9} cm
   c) 1×10^{-5} cm d) 1×10^{-12} cm
3. What is the full form of SPM in magnetic structures?
   a) Superpolymaterials b) Superparamagnetism
   c) Superphysicsmaterials d) Superparamaterials
4. What happens to the band gap of semiconductor nanoparticles?
   a) Increase b) Decrease
   c) First increase then decrease d) Do not change
5. Fabrication of Au and Ag wires using the DNA as template was first reported by…..
   a) Martin and co-workers b) Braun and co-workers
   c) Tour and co-workers d) Mitcell and co-workers
6. MD stimulations are used to understand…
   a) Structure of various Paranemic crossover (PX) DNA molecules
   b) Stability of various Paranemic crossover (PX) RNA molecules
   c) Structure and stability of various Paranemic crossover (PX) Protein molecules
   d) Stability of various Paranemic crossover (PX) protein molecules

7. Cyanophycin was first detected in 1887 by….

a) Borzi b) Martin

c) Tour d) Braun

8. What is the percentage of S-layer proteins on the surface of Haloferax volcanii?

a) 95- 98 b) 60- 75

c) 13- 35 d) 15- 30

9. Which one of the following is the main feature of small molecules

a) High-affinity (selectivity) b) Cell permeable and accessible

c) Stable in cellular contexts d) All the above

10. Photosensitizers used in photodynamic therapy, in which light is used to generate…

a) Reactive oxygen b) Radiation

c) Radio active compound d) All the above

PART B (10 x 2 = 20 Marks)

11. Name any four nanomaterial.
12. How will you distinguish top down approach from bottom up approach?
13. Why C-60 molecules are called as bucky balls? Give reasons.
14. List any four application of nano structures in sensors.
15. How DNA based artificial nanostructures are produced?
16. Write a note on DNA double nanowire.
17. Briefly narrate the applications of PHA in nanobiotechnology.
18. How will you distinguish rhodopsin from bacteriorhodopsin.
19. List any four nanotechnology based cancer diagnosis.
20. What is a gene chip?

PART C (5 x 14 = 70 Marks)

21. a) Write a note on the ethical and commercial aspects of nanobiotechnology.

(OR)

b) Explain various architectural characteristics of carbon nanotubes with suitable illustrations.

22. a) (i) Enlist the tools for measuring nanostructures. Explain any one tool in detail. (7)

(ii) Explain the tools to make nanostructures. (7)

(OR)

b) (i) Write short note on following: (7)
Semiconducting nanoparticles.

(ii) Properties of nanotubes. (7)

23. a) (i) How can biomolecules be used for nanomaterial assembly? (7)

(ii) Write a note on functioning of cells at the nano scale. (7)

(OR)

b) What are the systems used and how nanoparticles are useful in the field of nanobiology?

24. a) Write detailed notes on bacteriorhodopsin and their uses in beaming laser light.

(OR)

b) Write detailed notes on magnetosomes and their applications in the area of nanotechnological and biomedical applications.

25. a) (i) What is active targeting and passive targeting in drug delivery? Explain in detail. (4)

(ii) List any five nanoscale device with their working principles. (10)

(OR)

b) (i) Explain how smart materials are used in drug delivery. (10)

(ii) Write a note on nanobiosensor. (4)

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