

[A-37]

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Sardar Patel University
MSc Integrated Biotechnology Examination -Semester 10
PS10CIGGB3: Nanobiotechnology and Application
Saturday 2nd April, 2016
10:30 am to 1:30 pm

Note:

Total Marks: 70

1. Figures to the right indicate marks.
2. Draw neat and labelled diagram, wherever necessary.

Q.1 Multiple choice questions

[08]

- 1 Bulk material convert to nano material resulted in
a) increase of surface area to volume ratio b) decrease in surface area to volume ratio c) surface area to volume ratio remains constant d) none of these
- 2 _____ has highest net negative charge.
a) protein b) Lipid c) DNA d) carbohydrate
- 3 In experiment for preparation of carbon nanotubes rolling vector was (7:7). These CNT belongs to _____ type of nanotube.
a) Zigzag b) Chiral c) Armchair d) MWNT
- 4 Following property is not offered by Sol gel technology over plastic technology.
a) Inertness b) stability to heat c) decomposition by sun light d) stability of encased molecules is higher
- 5 Silver nitrate incorporated on DNA by _____ it using hydroquinone.
a) oxidizing b) reducing c) precipitating d) charge interaction
- 6 When single chain lipids with small head group areas with critical packing parameter between 1/3-1/2 mixed with water and allow assembling _____ structure.
a) Spherical micelles b) Cylindrical micelles c) Bilayers d) inverted micelles
- 7 The goal of negative design is to ensure that _____.
a) a single folded conformation is created b) it allow all possible interactions
c) it fit together like pieces in a puzzle d) it allow hydrophobic interactions
- 8 Following is not true for Carbon a key raw material to bionanotechnology.
a) providing a wide range of design options
b) The diverse & stable bonding
c) allow additional molecular properties and functionalities by incorporating atoms like oxygen and nitrogen
d) can form hydrogen bonds easily

Q.2 Attempt any seven

[14]

- 1 Define: top down and bottom up approaches for nano material synthesis.
- 2 Define magic number.
- 3 Briefly describe principle of CVD.
- 4 Schematically present AFM.
- 5 Why bacteriorhodopsin is successfully utilize in preparation of sensors compared to other proteins?

- 6 Briefly describe natural nano scale motors.
- 7 Briefly narrate role of chaperone in protein folding.
- 8 Give two examples of natural sensors.
- 9 Which forces prominent at nanoscale?
- Q.3** A Write a note on natural information derived nanomachinery using appropriate example. [06]
- B Justify “chemical transformation process lead by enzyme is specific” using appropriate example. [06]
- OR
- B What are quantum dots? Describe the formation of Quantum dots and its applications. [06]
- Q.4** A Give detailed account on sol-gel method. [06]
- B What are rolling vectors? How they produce different types of carbon nanotubes? Briefly describe the properties of carbon nanotubes? [06]
- OR
- B Write a short note on deep UV lithography. [06]
- Q.5** A Narrate the functioning of 3D memory using bacteriorhodopsin protein. Describe its advantages over conventional storage. [06]
- B Narrate construction and functioning of light addressable potentiometric sensor. [06]
- OR
- B What is targeted drug delivery? Narrate the use of lipid for drug delivery. [06]
- Q.6** A What are biomaterials? Describe properties of biomaterials for their application in implants and prosthesis. [06]
- B Describe negative and positive design in protein folding. [06]
- OR
- B Give comparative account on DNA microarray fabrication methods. [06]

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