

[A-26]

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Sardar Patel University
MSc Integrated Biotechnology Examination -Semester 10
PS10CIGGB3: Nanobiotechnology and Applications
Saturday 25th April, 2015
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 While converting bulk material to nano material enhanced properties are because of
 - a) surface area to volume ratio increases
 - b) surface area to volume ratio decrease
 - c) surface area to volume ratio remains constant
 - d) none of these
- 2 Following molecule allows the charge transfer and can be used as nano wire
 - a) protein
 - b) Lipid
 - c) DNA
 - d) carbohydrate
- 3 Following is not present in fullerene C₆₀.
 - a) a number of five membered ring isolated by six member rings
 - b) rugby ball shape
 - c) atoms contained within are said endohedral
 - d) also known as buckyball
- 4 During Plasma arcing, raw material is _____
 - a) evaporated
 - b) converted to ionized gas
 - c) flamed
 - d) charged
- 5 For specificity in biosensor, _____ is preferred.
 - a) one
 - b) two
 - c) three
 - d) four
- 6 Upon mixing thiolated lipid with gold, thiol group held on surface of gold by ____
 - a) hydrogen bond
 - b) ionic interaction
 - c) covalent linkage
 - d) adsorption
- 7 Following is not true for Actin filaments
 - a) associates to form a directional helical structure with two different ends. When
 - b) monomers add to one end 10 times faster than the other end
 - c) highly dynamic in living cells,
 - d) support and connect cells into tissues
- 8 Most abundant raw material present in nature is _____
 - a) nitrogen
 - b) oxygen
 - c) carbon
 - d) phosphate

Q.2 Attempt any seven

[14]

- 1 Briefly narrate significance of reduction in size with respect to bulk property.
- 2 What is magic number?
- 3 Briefly describe principle of dual pulse laser-beam method.
- 4 Principle of AFM.
- 5 Advantages of protein based 3D memory over conventional storage.
- 6 What is Critical packing parameter?
- 7 Applications of HTPS platforms.
- 8 Briefly narrate role chaperone.

9 Briefly describe forces important at nanoscale.

Q.3 A “Biological machinery excels in one ability above all others in performing specific chemical transformations” justify using trios isomerase as example. [06]

B Narrate the natural information derived nanomachinery to build nanomachine using appropriate example. [06]

OR

B What are quantumdots? Describe the formation of Quntumdots and its applications. [06]

Q.4 A Give detailed account on sol-gel method. [06]

B Write short note on chemical vapour deposition method. [06]

OR

B Write a short note on Deep UV Lithography. [06]

Q.5 A Narrate the construction and functioning of gramicidine based ion channel sensor. [06]

B Narrate construction and functioning of light addressable potentiometric sensor. [06]

OR

B Write a note on Lipids as structural principle of nano-machine construction [06]

Q.6 A Discuss factors influencing protein folding at nano scale. [06]

B What are biomaterials? Describe properties of biomaterials for their application in implants and prosthesis. [06]

OR

B Give detailed comparative account on DNA microarray fabrication by oligonucleotide and in situ method. [06]

