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[A-27]

Sardar Patel University
MSc Integrated Biotechnology Examination -Semester 10
PS10CIGIB3: 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 C_{60}.
a) a number of five membered ring isolated by six member rings
b) also known as buckyball
c) atoms contained within are said endohedral
d) rugby ball shape

4 During Plasma arcing, raw material is _____
a) evaporated b) charged
c) converted to ionized gas d) flamed

5 Gramicidine ion channel is made up of _____ protein subunits.
a) one b) two c) three d) four

6 Upon mixing thiolated lipid with gold, lipid through 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 a Chaperone.
a) has hydrophobic core
b) allow aggregation of proteins
c) provide space for folding of protein
d) swell once protein is in side and chaperone is capped

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 ball milling process.

4 Schematically present Deep UV lithography.

5 Application of DNA as glue.

6 What is Critical packing parameter?

7 Applications of HTPS platforms.

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8 Define dispersion and repulsion forces.

9 Briefly describe forces important at nanoscale.

Q.3 A Write a note on natural information derived nanomachinary using appropriate example. [06]

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

OR

B "Biological machinery excels in one ability above all others in performing specific chemical transformations" justify using trios isomarase as example. [06]

Q.4 A How different types of carbon nanotubes formed? Briefly describe the properties of carbon nanotubes. [06]

B Give detailed account on sol-gel method. [06]

OR

B Write a short note on ion beam lithography. [06]

Q.5 A Narrate the functioning of 3D memory using bacteriorhodopsin protein. Describe its advantages over conventional storage. [06]

B What advantage cell based sensors offered over conventional enzyme based sensors? Describe Cell based sensor using appropriate example. [06]

OR

B Write a note on Lipids as structural principle of nano-machine construction [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 detailed account on DNA microarray fabrication. [06]

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