[4-A] **SEAT No._____** No. of Printed Pages : 2

Sardar Patel University
MSc Integrated Biotechnology Examination -Semester 10
PS10CIGIB3: Nanobiotechnology and Applications
Saturday 15th April, 2017
10:00 am to 1:00 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 _____ is remain functional only if correct structure retain.
a) protein b) Lipid c) DNA d) carbohydrate

3 In experiment for preparation of carbon nanotubes rolling vector was (10:7). These CNT belongs to _____ type of nanotube.
a) Zigzag b) Chiral c) Armchair d) MWNT

4 Material is converted to ionized gas in _____ method.
a) plasma arcing b) CVD c) ball milling d) none of these

5 _____ is used as a targeted delivery drug delivery vehicle.
a) micelles b) liposome c) liposome with antibody d) DNA

6 _____ is used for preparing SAM on gold electrode.
a) Lipid b) thioalkenoates c) proteins d) DNA

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 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 nanoparticle and nanopowder.

2 Define magic number.

3 Briefly describe principle of dual pulse laser-beam method.

4 Schematically present SEM.

5 Why lipid can be used as bricks in a nano machinery?

6 Briefly describe flagella as nanomoter.

7 Briefly narrate the role of chaperone in protein folding.

8 Role of nano material in cosmetics.

	9	Raw materials used in natural nano machinery.	
Q.3	A	Why chemical transformation process lead by enzyme is specific? Explain using appropriate example.	[06]
	B	Write a note on the natural information derived nanomachinary using appropriate example.	[06]
		OR	
	B	"The reduction in the dimension improves properties of material" justify using appropriate example.	[06]
Q.4	A	Write a short note on deep UV lithography.	[06]
	B	What are rolling vectors? How they produce different types of carbon nanotubes? Briefly describe the properties of carbon nanotubes?	[06]
		OR	
	B	Give detailed account on the plasma arcing method.	[06]
Q.5	A	What is the importance of data storage device? Narrate the functioning of 3D memory using bacteriorhodopsin protein. Describe its advantages over conventional storage.	[06]
	B	Narrate the construction and functioning of gramicidine based ion channel sensor.	[06]
		OR	
	B	What is critical packing parameter? How lipids can be self assembles in various shapes?	[06]
Q.6	A	What are biomaterials? Describe properties of biomaterials for their application in implants and prosthesis.	[06]
	B	Describe forces play a role in protein folding.	[06]
		OR	
	B	Enlist types of microarray. Give comparative account on DNA microarray and protein microarray.	[06]