M.Sc. (Physics) Third Semester (Old) MSC23107 - Paper-V (Optional) Nanoscience and Nanotechnology-I

P. Pages : 2 Time : Three Hours		$\begin{array}{c} 2 \\ \text{bree Hours} \\ \end{array}$	GUG/W/18/23 Max. Marks :	GUG/W/18/2307 Max. Marks : 80	
1.		Either:			
	a)	What is quantum confinement effect? How it is affected on material be wells, wire, dots.	haviour in quantum	8	
	b)	Discuss variation observed in nanomaterial due to shift photoluminesce	ence peaks.	8	
		OR			
	c)	Discuss free electron theory in nanomaterials Highlight its features.		8	
	d)	State and explain DebyeScherrer formula to determine particle size of	f nanomaterials.	8	
2.		Either:			
	a)	Explain synthesis of Nanomaterial through Laser Ablation and Laser P	yrolysis method.	8	
	b)	Explain chemical vapor deposition method for synthesis & nanomateria	als.	8	
		OR			
	c)	Discuss high energy ball milling process of nanomaterial synthesis.		8	
3	d)	What is photolithography technique. How it is used to prepare nanomat	erials.	8	
	a)	Explain Transmission Electron Microscope. Its use in microscop disadvantages.	y, advantages and	8	
	b)	What is scanning TEM describe the working principle of scanning TEM	A and uses.	8	
		OR			
	c)	Describe the principle of working of AFM in three different mode.		8	
	d)	Discuss the importance of VSM for analysing the magnetic material wi	th an example.	8	

4. Either:

5.

a)	What is the basic difference between metal and semiconductor nanoclusters. Give suitable	8
	example.	

b) How CNT are made and applications of CNT.

OR

8

c)	What is the application of Aerogel? Why it is known as good insulator?	8
d)	Explain structural and magnetic behaviour of nanomaterial.	8
a)	Explain the term density of states.	4
b)	How nanomaterials are prepared by using ionised cluster beam deposition method.	4
c)	Write a note on spintronics.	4
d)	Explain Porous silicon.	4
