C.U.SHAH UNIVERSITY Summer Examination-2016

Subject Name: Physics and Chemistry of Nanomaterials

Subject Code: 5SC0	4PCE1	Branch: M.Sc(Physics)	
Semester: 4	Date: 05/05/2016	Time: 02:30 To 05:30	Marks: 70

Instructions:

- (1) Use of Programmable calculator and any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

SECTION – I

Q-1 Attempt the Following questions

(07)

- Give the name of nucleation process used in film growth. a.
- **b.** Give the name of types of PVD process.
- c. Define: Nano bots / Nano robots.
- **d.** What is spontaneous growth?
- e. When electro spinning occurs?
- f. Enlist the names of methods of synthesis of Nano materials using top-down approach.
- g. Classify porous solids from their pore diameter.

Q-2	_	Attempt all questions	(14)
1	Explain about the fundamentals of thin film growth by nucleation with necessary		
	2	diagram. What is CVD method? Explain.	(7)
		OR	

Q-2 **Attempt all questions** (14) Write a note on: Vaccum Science. 1 (5) 2 Explain: Super lattices. (5) 3 State the classification of Hybrids. (4) Q-3 Attempt all questions (14)Explain about the synthesis of metallic Nano particles. 1 (5) Explain about the fundamentals of evaporation condensation growth with figure. 2 (5) (4)

3 Write a short note on: Electro spinning.

OR

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Q-3			Attempt all questions	(14)
	1		Write a note on: Challenges in Nano technology.	(5)
	2		What is Aerosol synthesis? Explain.	(5)
	3		Write a note on: Vapor- Liquid-Solid (VLS) growth.	(4)
			SECTION – II	
Q-4		Attempt the Following questions		(07)
		a.	Define: Super lubricity.	
		b.	What is Sensor?	
		c.	What is single molecule electronic device?	
		d.	On which factors the characterization of Nano materials depends?	
		e.	Write down a shortcoming of TEM.	
		f.	Define: Surface plasma Resonance.	
		g.	Define; Super paramagnetics.	
Q-5			Attempt all questions	(14)
	1		Explain about a nano-electronic devices called computers and memory storage.	(7)
	2		Define and explain: Nano sensor. State its applications too.	(7)
			OR	
Q-5			Attempt all questions	(14)
	1		Write a short note on: Nanorobots/ Nano bots.	(5)
	2		Write a short note on; Micro electro mechanical system.	(5)
	3		Explain about QCM- Quartz crystal microbalance.	(4)
Q-6			Attempt all questions	(14)
	1		Explain in brief about small angel X-ray scattering.	(7)
	2		Write a short note on: Scanning electron Microscopy.	(7)
			OR	
Q-6			Attempt all Questions	(14)
	1		Write a note on: X-ray diffraction.	(5)
	2		State the mechanical properties of Nano-materials.	(5)
	3		What is Surface scattering? Explain.	(4)

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