

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Nanoscience and Nanotechnology

Subject Code : 4SC05NNE1

Branch :B.Sc. (Physics)

Semester : 5

Date:01/04/2017

Time : 2:30 To 5:30

Marks :70

Instructions:

- (1) Use of Programmable calculator & 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.

Q-1	Attempt the following questions:	(14)
	a) What is top down approach?	01
	b) Which optical instrument is used to study surface of the material?	01
	c) Give applications of nanomaterials.	01
	d) What is TEM?	01
	e) Write full name of CNT. How many types of it?	01
	f) How can we measure thermal properties of nanoparticles?	01
	g) How nanoparticle act as efficient catalysts?	01
	h) Define: intrinsic size effect.	01
	i) Define: extrinsic size effect.	01
	j) What do you mean by size effects in nanomaterials?	01
	k) State the difference between CVD and PVD process.	01
	l) Define: Colloidal method.	01
	m) What is nanotechnology?	01
	n) What is SEM?	01
Attempt any four questions from Q-2 to Q-8		
Q-2	Attempt all questions	(14)
	a) Explain physical vapour deposition (PVD) method.	05
	b) Explain thermal and chemical properties of nanoparticles.	05
	c) Discuss why bottom up process is more important than top down process in synthesizing nanomaterials?	04
Q-3	Attempt all questions	(14)
	a) Explain how carbon nanotubes are formed. Discuss their structure, characteristic properties and application.	07
	b) Give various applications of nanomaterials in general.	07
Q-4	Attempt all questions	(14)
	a) What are nanomaterials? Describe briefly different types of nanomaterials and discuss their structures.	07
	b) Give an account on electrical and magnetic properties of nanomaterials.	07



Q-5	Attempt all questions	(14)
	a) Explain in details the principle and working of SEM with figure.	07
	b) Explain sol gel method in detail.	07
Q-6	Attempt all questions	(14)
	a) Explain principle and working of TEM with neat and sketch diagram.	07
	b) Discuss about some Nano-challenges.	05
	c) Define: chiral factor for CNT with its formula.	02
Q-7	Attempt all questions	(14)
	a) Explain in details scanning probe instrument technique.	05
	b) What is smart materials? Discuss about it.	05
	c) Explain mechanical properties of nanoparticles.	04
Q-8	Attempt all questions	(14)
	a) Discuss how X-ray diffraction technique is used to study the nanomaterials?	05
	b) Explain CVD process.	05
	c) Explain the role of nanomaterials in sensors and optics.	04

