

Reg.No. _____



Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 16NT2003
Sub. Name : Properties of Nanomaterials

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Define Quantum dot and Exciton Bohr radius	1	6
	b.	Classify the size reduction of bulk materials in to different like 1D, 2D and 3D with suitable schematic	1	14
(OR)				
2.	a.	Compare the Quantum Well, Quantum Wire, Quantum Dot structures with suitable electron confinements	1	10
	b.	Distinguish the density of states of bulk, quantum states with suitable diagrams	1	10
3.	a.	What are the physical properties of nanomaterials that change accordingly with size	2	10
	b.	What happens to melting point when the surface energy increases?	2	10
(OR)				
4.	a.	Name the primary reason for the increased hardness of the materials upon size reduction and discuss	2	10
	b.	Based on Gibbs why is the melting point changes with the nanoscale	2	10
5.	a.	Classify the carbon nanotubes based on its chirality with suitable schematic	2	10
	b.	What are the electrical properties of carbon nanotubes	2	10
(OR)				
6.	a.	What happens with the size of a material is reduced from bulk to nano in terms of band gap	2	10
	b.	Demonstrate the electrical properties of CNT's through the Van Hove singularities and step potential	2	10
7.	a.	Describe the processes of optical absorption in nanomaterials and the regions of interest like absorption edge, blue shift	2	10
	b.	Using the UV-Vis absorbance spectrum how will you interpret the presence of nanoparticles. explain with suitable graphical representations	2	10
(OR)				
8.	a.	Describe the surface Plasmon resonance phenomena and explain how it is more pronounced in nanomaterials	2	20
<u>Compulsory:</u>				
9.	a.	Demonstrate the B-H characteristic for hard, soft and Super paramagnetic materials.	2	10
	b.	Classify the different magnetite materials with suitable diagrams	1	10

ALL THE BEST