

November - 2015
M.Sc. Physics Examination Semester - 3
Phys-N301 : Physics of Nanomaterials
Paper Code- 4707

Time : 2 Hours 30 min

Maximum Marks 70

1.	(a) Review of quantum mechanics in context of nanostructures . (b) Discuss nanotechnology health risk and ethics.	[07] [07]
OR		
1.	(a) Discuss in detail: Nanotechnology-Ethics (b) What are the challenges in nanotechnology, and also discuss future prospects of it	[07] [07]
2.	(a) Size effects in metal or semiconductor nanoparticles. (b) Discuss conduction electron and dimensionality with example.	[07] [07]
OR		
2.	Discuss with example: mechanical, structural, melting, electrical , optical and magnetic properties of nanosystems dependent on density of states.	[14]
3.	Discuss in detail : processing of nanoparticles (a) binding mechanisms in nanoparticles (b) dispersion of nanoparticles (c) stabilization of nanoparticles	[14]
OR		
3.	(a) Write a note on Carbon allotropes and Carbon nanostructures (b) Discuss electronic, transport, optical, thermal, vibration and mechanical properties of carbon nanotubes	[07] [07]
4.	Explain followings with adequate figures and graphs (a). Vector notation for CNT (b). Unit cells of CNT (c). Symmetry classification of CNT	[14]
OR		
4.	(a)Discuss any three purification processes of singlewalled and multiwalled CNT (b)Why CNT are very important and if so why we are unable to use it in practical life (c)Discuss bonding in carbon allotropes	[06] [04] [04]
5.	Write notes on: (i) Future challenges in DNA nanotechnology (ii) Prerequisites for structural DNA nanotechnology (iii) Uses of DNA as nanomaterial	[14]
OR		
5.	Write notes on: (i) industrial significance of biomimetics (ii) biomedical applications of nanoparticles (iii) Health hazards of nanoparticles	[14]