Oct-Nov- 2017

M.Sc. Physics Examination, Semester 3
Physics of Nanomaterials {PhysN-301]
Paper Code: 4707

Time : 2Hrs 30Min Max Marks:70

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|---|---|---|
| Q1. | a. Discuss current research and future prospects of nano technology.<br><br>b. Write applications of nanotechnology in detail. | [7]<br><br>[7] |
| | OR | |
| Q1. | a. Discuss nanotechnology health risk and ethics.<br><br>b. Give importance and emergence of nanotechnology. | [7]<br><br>[7] |
| | | |
| Q2. | Derive density of states for 0D, 1D and 2D nanostructure. | [14] |
| | OR | |
| Q2. | a. 1. Define following terms: electron confinement, density of states.<br>2. What is surface to volume ratio, discuss in contest of nanomaterials<br><br>b. Discuss conduction electron and dimensionality with example. | [4]<br>[3]<br><br>[7] |
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| Q3. | a. Explain binding mechanism of nanoparticles for the application of magnetic drug delivery system.<br><br>b. Discuss applications of two-dimensional Nanomaterials. | [9]<br><br>[5] |
| | OR | |
| Q3. | a. Discuss Dispersion techniques for Nano particles in Matrix Composites.<br><br>b. Explain Electrostatic Stabilization of Nanomaterials. | [7]<br><br>[7] |
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| Q4. | a. Explain the LASER evaporation technique of synthesis for CNT in detail.<br><br>b. Discuss application of Carbon nano tube in detail. | [7]<br><br>[7] |
| | OR | |
| Q4. | a. Explain synthesis technique for multi-walled carbon nano tube.<br><br>b. Discuss physical property of carbon nano tube. | [7]<br><br>[7] |
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| Q5. | What are the biological entities that can be used for biosynthesis of various nanoparticles. Give an account of biosynthesis of silica nanoparticles by plants. | [14] |
| | OR | |
| Q5. | Write notes on:<br>a. Prerequisites for structural DNA nanotechnology.<br>b. Uses of DNA as nano-material | [14] |