

M.Sc.(Physics) (CBCS Pattern) Semester-III
PSCPHYT12-2 - Paper-XII - Fundamentals of Nanoscience and Nanotechnology

P. Pages : 2

Time : Three Hours



GUG/W/24/11303

Max. Marks : 80

Either:

1. a) Discuss the density of states for zero, one, two and three dimensional materials. 8
- b) Discuss briefly Quantum wells, wires and dots. 8

OR

- e) Describe Schrodinger equation for particle in a box. 8
- f) Discuss the working of p-n junction and bipolar Transistor. 8

Either:

2. a) Write the importance of thermal behaviour of nano-material compared with bulk material. 8
- b) Explain structural and electrical properties of carbon nanostructure. 8

OR

- e) Discuss the structure of nanotubes. 8
- f) Explain the optical and mechanical properties of nanomaterials. 8

Either:

3. a) Explain the chemical vapour deposition techniques. 8
- b) Discuss cluster beam deposition in details. 8

OR

- e) Describe PUD technique for the synthesis of nanoparticles. 8
- f) Describe combustion method and wet chemical method for the synthesis of nanoparticles. 8

Either:

4. a) Describe the structure of DNA double nanowire. 8
- b) Discuss Micelles and Vesicles. 8

OR

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| e) | What is meant by bioelectric and biosensors. | 8 |
| f) | Discuss the Biological building block of Bionanotechnology. | 8 |

5. Attempt all the followings.

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| a) | Describe Heisenberg's uncertainty principle. | 4 |
| b) | Explain the magnetic property of nanomaterial. | 4 |
| c) | Explain Bottom up Ball Milling synthesis. | 4 |
| d) | Discuss Bilayers. | 4 |
