

M.Sc. (Physics) (CBCS Pattern) Semester-III
**PSCPHYT11-2 -Paper-XI Core Elective E1.2 : Nanoscience and
Nanotechnology-I**

P. Pages : 2

Time : Three Hours



GUG/S/25/11299

Max. Marks : 80

Either:

1. a) Discuss, why there is shift of peak in nano size photoluminescence materials. 8
- b) What is Raman spectroscopy? Discuss its sensitivity to Nanoscale of materials. 8

OR

- e) Explain the density of states of zero-, one-, two- and three-dimensional materials. 8
- f) Discuss the relation between size dependent properties in Nanomaterials. 8

Either:

2. a) Explain the laser ablation and laser pyrolysis in nanomaterials synthesis. 8
- b) Draw a schematic diagram of synthesis of nanoparticle by CVD and explain its working. 8

OR

- e) Discuss the combustion method and wet chemical method. Explain its merits and demerits. 8
- f) Explain Langmuir-Blodgett method of synthesis of Nanomaterials. 8

Either:

3. a) What is spintronics? Discuss use of spintronics in nanotechnology. 8
- b) How can you explore vibration sample magnetometer in determination of magnetic property. 8

OR

- e) Discuss Atomic force microscopy used for characterization of nanomaterials. 8
- f) Explain the transmission electron microscopy. 8

Either:

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| 4. | a) | Discuss the effect of nano size on the optical and structural properties of nano materials. | 8 |
| | b) | Discuss porous silicon and Aerogels. | 8 |

OR

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| | e) | Discuss the mechanical and thermal properties of nanomaterials. | 8 |
| | f) | Explain with suitable diagram the structure of carbon nanotubes (CNT). | 8 |
| 5. | | Solve following questions. | |
| | a) | Discuss quantum confinement. | 4 |
| | b) | Explain micro emulsion process. | 4 |
| | c) | Explain scanning electron microscopy. | 4 |
| | d) | Describe briefly - Core-shell structure. | 4 |
