

M.Sc.-Semester-4
Preparation Techniques and Characterization of Nanomaterials
Paper Code: 10305
[Phys-N401]

April - 2017

Time: 2Hours 30Min

Marks: 70

Note: Answer all questions. Figures to the right indicate marks allotted.

- 1(a) Explain Inert gas condensation technique of nanomaterial synthesis. [07]
1(b) Explain any one of the physical vapour deposition techniques. [07]
- OR
- 1 Explain Molecular beam epitaxy with equipment diagram. [14]
2 Explain Chemical precipitation and co-precipitation techniques in detail. [14]
- OR
- 2(a) Discuss Sol-gel technique of nanomaterial synthesis. [08]
2(b) Explain emulsion and micro emulsion in brief. [06]
- 3(a) Explain Binomial distribution. [08]
3(b) Discuss differences between conventional heating and microwave heating. [06]
- OR
- 3(a) Explain Gaussian or Normal Distribution. [07]
3(b) Explain Mean, Variance and Co-variance [07]
- 4(a) Explain in detail, working principle of Energy Dispersive X-ray Spectroscopy [EDS/EDAX] with diagram [07]
4(b) Explain working principle of Atomic force microscopy. Compare AFM with SEM [07]
- OR
- 4 Compare working principle of TEM and STM in detail. Give applications of both. [14]
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- 5(a) Explain Josephson effect. [04]
5(b) What is SQUID? Explain components of it in short. Write some applications. [10]
- OR
- 5(a) Explain in detail working principle of DSC. Compare DSC with TGA. [09]
5(b) What is TGA? Explain working principle and application of TGA. [05]