Reg. No.:

प्रज्ञानं ब्रह्म
Manipal
INSPIRED BY LIFE

Manipal University

Department of Applied Sciences – M. Sc. (Physics)

Subject: Condensed Matter Physics-I (PHY-707.1)

Time: 3 hr **December 2015** **Max. Marks: 50**

Note: Answer any FIVE full questions **Marks**

1.a). Mention the merits and demerits of preparation of the thin film by resistive heating and arc evaporation techniques. (4)

b). Derive the Knudsen cosine law for the surface source of evaporation adopted in the thin film preparation. (6)

2. a). Describe the preparation of thin films using LB method and mentions its applications. (6)

b). Mention the difference between magnetron and reactive sputtering process. (4)

3. a). Discuss the merits and demerits of chemical vapour deposition and chemical reaction deposition. (4)

b). Explain the effect of deposition parameters on nucleation and growth of thin films. (6)

4. a). Derive an expression for conductivity of continuous metal films based on surface scattering. (6)

b). Discuss the influencing factors on conductivity of semiconductor thin films. (4)

5. a). Derive an expression for transmission of light by non-absorbing single layer thin films using summation method. (7)

b). Write the conditions for single layer antireflection coating. (3)

6. a). How are nano-materials prepared under top-down approach?. Explain with proper diagram. (6)

b). Explain the preparations and applications of fullerene. (4)

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