

Code: AE2T4, CE2T3, EE2T2, ME2T2

**I B.Tech-II Semester-Regular Examinations - July 2013**

**ENGINEERING PHYSICS**  
**(For AE, CIVIL, EEE, MECHANICAL)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Explain plank's theory of black body radiation. 6 M  
b) Determine the energy values of particle in a box as application of Schrödinger's wave equation. 8 M
2. a) What is packing fraction? Deduce the packing factors for sc, bcc and fcc structures. 8 M  
b) Derive Bragg's law of X-ray diffraction by crystals. 6 M
3. a) Discuss the successes and failures of the free electron theory. 6 M  
b) Write in detail classification of materials. What is an effective mass of an electron. 8 M

4. a) Discuss the frequency dependence of dielectric constant for a dielectric material and polarizability. 8 M
- b) Write short notes on Local field inside a dielectric. 4 M
- c) List out some important applications of dielectrics. 2 M
5. a) Explain clearly the difference between hard and soft magnetic materials. 7 M
- b) Distinguish between Type-I and Type-II superconductors and their magnetic properties. 7 M
6. a) What are semiconductors? Distinguish between intrinsic and extrinsic semiconductors. 4 M
- b) Write a note on direct gap semiconductor. 3 M
- c) Explain conversion efficiency in connection with solar radiation and give applications. 7 M
7. a) Describe the principle, construction and working of He-Ne laser. 7 M
- b) How does light propagate along a fibre? State applications of optical fibres. 7 M

8. a) What are nano materials? Give chemical and physical properties of nano materials. 6 M
- b) What are quantum nanostructures? 4 M
- c) What are the different types of Carbon nano tubes? 4 M