

Manufacturing Engg. All Semesters.

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B.E./B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2012

Second Semester

Manufacturing Engineering

PH 9164 — PHYSICS OF MATERIALS

(Regulations 2008)

Time: Three Hours

Maximum marks: 100

Answer ALL questions

PART A — (10 x 2 = 20 Marks)

1. What is the use of lever rule?
2. Draw a general binary phase diagram for completely soluble components.
3. What is the physical significance of wave function?
4. What are high T_c superconductors? Give two examples.
5. What is effective mass of an electron?
6. Mention the uses of Hall effect.
7. What is giant magneto resistance?
8. What are the different types of dielectric breakdown mechanisms?
9. List the steps involved in the fabrication a ceramics?
10. What are the advantages of using titanium alloys?

PART B — (5 x 16 = 80 Marks)

11. Describe any three techniques of growing single crystals.
 12. (a) Derive the time independent Schroedinger equation for a one-dimensional case. Use it to prove that a particle enclosed in a one-dimensional box has quantized energy values.

Or

(b) Explain the superconducting phenomenon. Discuss the properties and applications of superconductors.
 13. (a) Derive an expression for the concentration of electrons in the conduction band of an intrinsic semiconductor.

Or

(b) Derive an expression for the concentration of holes in the valence band of a p-type semiconductor.
 14. (a) Explain the various types of energy involved in ferromagnetic domain formation.

Or

(b) Deduce an expression for the local field in a solid dielectric and hence derive the Claussius-Mosotti equation.
 15. (a) What are metallic glasses? How are they prepared? Explain their applications.

Or

(b) Explain the methods used to fabricate fiber reinforced plastics and metals.
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