Reg. No. : | | | | | | | | | | | |

J 3388

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2009.

Second Semester

(Regulation 2004)

Chemical Engineering

PH 1156 — PHYSICS – II

(Common to Polymer Technology, Textile Technology, Bio Technology, Textile Technology (Textile Chemistry), Textile Technology (Fashion Technology) and Petroleum Engineering)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write a short note on Fermi level.

2. How do you confirm that the given material is a high Tc superconductor?

3. Write a short note on effective mass of an electron.

4. Discuss the band theory of solids.

5. What is meant by Ferrites?

6. What are the differences between polar and non polar dielectrics?

7. Define Metallic glasses.

8. Write a short note on aluminum based ceramics.

9. What do you mean by M-scan?

10. List down any two radioactive isotopes used in nuclear medicine.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the important properties of metals? (4)

(ii) Derive an expression for Widemann and Franz ratio. (12)

Or

(b) (i) Explain type I and type II superconductor. (8)

(ii) Discuss $YBar_2Cu_3O_{7-\delta}$ high Tc superconductor and mention its importance. (8)

12. (a) (i) Explain intrinsic semiconductor and extrinsic semiconductor. (6)

(ii) Calculate the carrier concentration in a *n*-type semiconductor and variation of Fermi level with temperature and also the concentration of donor atoms. (10)

Or

(b) (i) Define Hall effect. (4)

(ii) Calculate the Hall constant and derive an expression for mobility of the charge carriers. (12)

13. (a) Discuss the different types of polarization in dielectrics and derive an expression for Langevin-Debye equation. (16)

Or

(b) (i) Discuss Weiss theory of Paramagnetism and Ferromagnetism. (12)

(ii) What is the importance of Iron-Nickel alloy. (4)

14. (a) (i) Give an account of SMART materials and their applications. (8)

(ii) Discuss different types of fiber reinforcement in plastics. (8)

Or

(b) (i) Explain the thermal, mechanical and electrical properties of ceramic materials. (8)

(ii) Discuss Ferroelectric and ferromagnetic ceramics. (8)

15. (a) Explain the principle, construction and functioning of gamma camera with a neat diagram. (16)

Or

(b) Describe the working of Geiger-Muller counter and photo multiplier tube. (8 + 8)
