B 544

B.E / B.Tech DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Second Semester

Chemical Engineering

PH 134 — PHYSICS — II

(Common to : Fashion Technology, Bio – Technology, Leather, Polymers, Textile Chemistry and Textile Technology)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Gauss theorem.

2. What is electric quadrupole?

3. What is meant by wave function?

4. State the principle of Uncertainty principle?

5. Write a note on Nuclear fusion?

6. What are power reactors?

7. Lattice constant of copper is 0.38nm. Calculate the distance between (110) planes.

8. Give the co – ordination number for SC, BCC and FCC lattice.

9. What is the principle of radiography?

10. What is image quality indicator?

PART B — (5 × 16 = 80 marks)

11. (i) What are the types of capacitor? (2)

(ii) Explain Gauss theorem. (10)

(iii) Give the applications of Gauss theorem. (4)

12. (a) (i) Define Compton effect. (2)

(ii) Give the theory of Compton effect. (8)

(iii) Discuss the experimental verification of Compton effect. (6)

Or

(b) (i) What are matter waves? (2)

(ii) Derive an expression for energy levels of a particle inside an one dimensional infinitely deep potential well of width "L". (8)

(iii) Find the lowest energy of an electron moving in one dimension of an higher potential base of width 0.1 nm. (6)

13. (a) (i) What is Raman effect? (2)

(ii) What are the characteristics of atomic spectra? (6)

(iii) Explain Raman effect. (8)

Or

(b) (i) Define multiplication factor. (2)

(ii) Explain shell model of nuclear phenomenona. (7)

(iii) Discuss chain reaction. (7)

14. (a) (i) Describe the structure of HCP crystal. (4)

(ii) Derive the expression for atomic packing factor. for HCP crystal (8)

(iii) Show that for a simple cubic lattice, $d_{100} : d_{110} : d_{111} = \sqrt{6} : \sqrt{3} : \sqrt{2}$. (4)

Or

(b) (i) State Miler indices. (2)

(ii) Explain the different imperfections in a crystal. (12)

(iii) Draw ($1\bar{1}0$) plane in a cubic crystal. (2)

15. (a) (i) What is ultrasound? (2)

(ii) Explain the Ultrasonic flaw detection method in NDT. (14)

Or

(b) (i) What is image intensifier? (2)

(ii) Explain imaging techniques in Fluoroscopy. (14)
