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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2004.

Second Semester

Electrical and Electronics Engineering

PH 133 — PHYSICS – II

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What do you understand by dielectric polarization?

2. Write the differential form of Maxwell's equations.

3. Discuss the importance of Einstein's mass energy relationship.

4. Mention the differences between fission and fusion.

5. Explain packing factor and the coordination number.

6. What do you understand by the term pair production?

7. Discuss the importance of uncertainty principle.

8. Explain briefly the principle of Raman effect.

9. What are the different classifications of penetrants used in liquid penetrant method?

10. What is triboelectric effect?

PART B — (5 × 16 = 80 marks)

11. (i)   Derive an equation for the energy required to charge a conductor with electric charge Q at a potential V.   (8)

    (ii) Obtain an expression for the loss of electrostatic energy when a charged conductor share its charge with another.   (8)

12. (a) (i) Explain with necessary theory on how the Carey Foster's Bridge may be used to compare two nearly equal resistances. (10)

(ii) Explain how it can be used to determine the temperature coefficient of resistance of platinum. (6)

Or

(b) (i) State and prove Gauss theorem for electrostatic charges. (6)

(ii) Show that at a point P inside a charged sphere (where the charge is uniformly distributed) the electric intensity is directly proportional to the distance of P from the centre of the sphere. (10)

13. (a) (i) Discuss Bragg's law of X–ray diffraction. (6)

(ii) Explain the methodology used for determining the crystal structure using Bragg's law. (10)

Or

(b) Describe in detail :

(i) vector atom model

(ii) shell model and

(iii) four factor formula of fission chain reaction. (7 + 5 + 4)

14. (a) Explain in detail about :

(i) solution growth

(ii) melt growth and

(iii) point defects. (6 + 6 + 4)

Or

(b) Derive time dependent Schrodinger's wave equation and obtain its solution for a particle in a box. (8 + 8)

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15. (a) (i) Explain the principle of X–ray radiography. (3)

   (ii) Discuss the method of detecting the flaw of a specimen using X–ray radiography. (13)

Or

(b) Describe the ultrasonic and thermal method of testing the specimens. (10 + 6)

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