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

Question Paper Code : 41646

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Second Semester

Electrical and Electronics Engineering

PH 3202 — PHYSICS FOR ELECTRICAL ENGINEERING

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define dipole moment.

2. Differentiate Piezo and Pyroelectricity.

3. Write any two postulates of classical free electron theory.

4. Write Fermi-Dirac probability function and expand each term.

5. Mention the advantages of Schottky diode.

6. Construct energy band diagram with necessary energy levels of P- type semiconductor.

7. Define Plasmonics.

8. What will be the energy in eV for photon of wavelength 450 nm?

9. Why are nanomaterials having superior properties than bulk material?

10. Write the applications of spintronic devices.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the types of polarization in dielectrics and explain what happens to the polarizations under electric field of increasing frequency?

Or

(b) What is piezoelectricity. Explain how it can be produced?

12. (a) Obtain an expression for electrical conductivity of metals and discuss the advantages and disadvantages of classical free electron theory.

Or

(b) Compare dia, para and ferro magnetic materials in detail.

13. (a) Derive the expression for carrier concentration in an intrinsic semiconductor with neat diagram.

Or

(b) Explain the principle and working of Hall devices in detail.

14. (a) Explain the principle, construction and working of light emitting diode with neat diagram.

Or

(b) Discuss in detail about the optical processes in semiconductors.

15. (a) With suitable sketch, explain the working of single electron transistor.

Or

(b) Explain the construction and working of quantum well lasers.
