(16)

A).(8)

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(8)

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

Question Paper Code : P 1240

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Third Semester

Electronics and Communication Engineering

EC 1202 — ELECTRON DEVICES

(Common to B.E. (Part–Time) Second Semester Regulation 2005)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define mass action law.

2. What is forbidden energy? What are its typical values for insulators, conductors and semiconductors?

3. What is depletion region?

4. What does volt ampere characteristics of an ideal diode resemble?

5. Mention an important application of Zener diode.

6. What is dark current in a photo diode?

7. Define current gain α.

8. Why is FET called a voltage controlled device?

9. Define intrinsic standoff ratio of UJT.

10. Why are Sckottky diodes called hot carrier diodes?

PART B — ($5 \times 16 = 80$ marks)

11. (a) Explain the motion of an electron in the presence of parallel electric and magnetic fields and perpendicular electric and magnetic fields. (16)

Or

(b) Determine the effect of carrier concentration on the Fermi level in an intrinsic semiconductor. (16)

12. (a) (i) Explain the mechanism of diffusion in a semiconductor. (8)

(ii) Describe how the Hall Effect is used to determine whether a semiconductor is *n* or *p* type. (8)

Or

(b) (i) Describe with neat diagrams the effect of forward and reverse biasing a pn junction. (8)

(ii) What is reverse saturation current? Explain how it varies with temperature. (8)

13. (a) Draw the volt-ampere characteristics of a tunnel diode. Explain the tunneling phenomenon with energy band diagram. (16)

Or

(b) (i) Define transition capacitance. Obtain an equation for the transition capacitance for an abrupt pn junction. (10)

(ii) Explain how transition capacitance is utilized in a varactor diode. (6)

14. (a) (i) Plot the output characteristics of a transistor in CB configuration and indicate the various regions of operation in it. Explain the shape of the characteristics. (10)

(ii) What is base width modulation and what are its effects? (6)

Or

(b) Draw the structure of an enhancement MOSFET and explain its operation. (16)

15. (a) Draw the structure of a UJT and explain its volt ampere characteristics from its equivalent circuit. (16)

Or

(b) Draw the two transistor model of a SCR and explain its operation and characteristics. (16)
