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

C 3237

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Second Semester/Third Semester

(Regulation 2004)

Electrical and Electronics Engineering

EC 1211 — ELECTRONIC DEVICES

(Also common to Electronics and Instrumentation Engineering and Instrumentation and Control Engineering)

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

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Why a series resistor is necessary when a diode is forward biased?

2. Define Transition capacitance of a p-n diode.

3. Determine β and I_E for a transistor if $I_B = 50\ \mu A$ and $I_C = 3.6$ mA.

4. What bias conditions must exist for a transistor to operate as an amplifier?

5. Define pinch-off voltage.

6. If the V_{GS} of a n-channel JFET is increased negatively, what happens to the drain current I_D?

7. List any four applications of light emitting diode.

8. What is the difference between incoherent and coherent light and which is produced by a laser diode?

9. Why a reverse-biased varactor diode exhibits capacitance?

10. How can an SCR be turned ON and turned OFF?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define and derive the expression for diffusion capacitance of a p-n diode. (8)

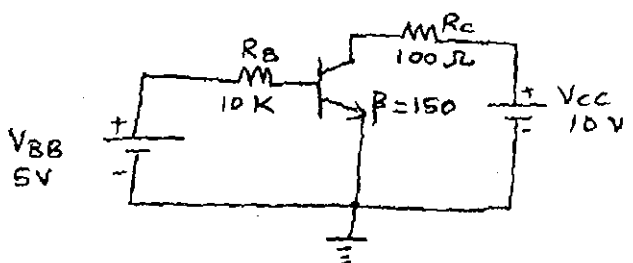
(ii) With necessary diagrams, explain the formation of the depletion region in a p-n diode. (8)

Or

(b) Derive the expressions for both forward current and reverse saturation current of a p-n diode. (16)

12. (a) (i) Draw and explain the input and output characteristics of common emitter configuration of a transistor. (8)

(ii) Determine I_E, I_C, V_{BE} and V_{CE} for the circuit shown below. (8)



Or

(b) (i) Draw the hybrid model for CE configuration and explain. (8)

(ii) Draw and explain the input-output characteristics of a common base configuration of a transistor. (8)

13. (a) (i) Draw the drain and transfer characteristics of a n-channel JFET and explain. (8)

(ii) With necessary diagram explain the principle of operation of a p-channel JFET. (8)

Or

(b) (i) Explain the principle of operation of a unijunction transistor. (8)

(ii) Explain how D-MOSFETs and E-MOSFETs differ. (8)

14. (a) (i) Discuss the operation and characteristics of photodiode. (8)

(ii) Explain the principle of operation of opto couplers. (8)

Or

(b) (i) Discuss the operation and characteristics of photo transistor. (8)

(ii) Describe the LASER diode and how it differs from an LED. (8)

15. (a) (i) Explain how zener diode can be used as a voltage regulator. (8)

(ii) Draw the characteristics of the tunnel diode and explain its negative resistance. (8)

Or

(b) (i) Describe the basic structure and operation of a Triac. (8)

(ii) Write short notes on piezo electric and charge coupled devices. (8)
