Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐

S 4807

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Annual Pattern — First Year

Electronics and Communication Engineering

EC 1X01 — ELECTRON DEVICES

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Enlist the types of resistors.

2. Why sweep generator is required in C.R.O.?

3. What are the differences between diffusion currents and drift currents?

4. What is the function of clamper circuit?

5. Draw the small signal equivalent circuit of N channel JFET.

6. If the base current in a transistor is 30 μA and the emitter current is 7.2 mA. What are the values of α, β and I_C?

7. Write the important uses of silicon dioxide.

8. Define SSI, LSI, MSI and VLSI circuits.

9. State the conditions for good ohmic contact.

10. Draw the characteristics of UJT and show the negative resistance region.

PART B — (5 × 16 = 80 marks)

11. (a) Derive an expression for the deflection in an electrostatic deflection system. Obtain the expression for electrostatic deflection sensitivity. (16)

Or

(b) Draw the block diagram of a cathode ray oscilloscope and explain its working. (16)

12. (a) (i) Derive the diode current equation. (10)

(ii) A p-n junction diode has at a temperature of 125°C, a reverse saturation current of 30 μA. Find the dynamic resistance for 0.2 V bias in forward and reverse direction. (6)

Or

(b) (i) With a neat diagram explain the photoconductive cell. (8)

(ii) Write short notes on :

(1) Optocoupler. (4)

(2) Backward diode. (4)

13. (a) With the neat diagram, explain the operation and input and output characteristics of CE configuration. (16)

Or

(b) (i) Explain the construction and working of n-channel JFET with neat diagram and symbol. (9)

(ii) The p-channel FET has a $|I_{DSS}| = -12$ mA, $|VP| = 5$ V, $V_{GS} = 5.32$ V. Calculate I_D, g_m and g_{mo}. (4)

(iii) Compare JFET and MOSFET. (3)

14. (a) (i) With suitable diagrams explain how integrated resistors are fabricated using mass technology. (9)

(ii) Write notes on isolation techniques. (3)

(iii) Write notes on design rules and layout techniques in the VLSI technologies. (4)

Or

(b) With neat sketches explain the fabrication of Bipolar transistors. (16)

15. (a) (i) With relevant sketches explain the construction, working and characteristics of Schottky diode. (10)

(ii) Write short notes on GTO. (6)

Or

(b) With neat diagram, explain the constructional details and working principles of SCR. (16)
