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

Question Paper Code : Q 2710

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

Annual Pattern — First Year

Computer Science and Engineering

EC 1X11 — ELECTRON DEVICES AND CIRCUITS

(Common to Information Technology)

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions

PART A — (10 × 2 = 20 marks)

1. Draw the energy band diagram of n-type silicon semiconductor.

2. What is meant by diffusion capacitance in diode?

3. In a BJT, $\beta = 150$, $I_B = 10\ \mu A$ and $I_{CEO} = 50\mu A$. Find the value of I_C.

4. What is meant by thermal runaway in BJT?

5. Compare the input impedance and the voltage gain of CE and CC amplifiers.

6. What are the advantages of negative feedback in amplifier?

7. Draw the V-I characteristics of TRIAC.

8. Write the function of opto isolator.

9. What operation is done during epitaxy in monolithic IC fabrication?

10. What are the advantages of active filter over passive filter?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the energy band structure of PN junction diode. (8)

(ii) Describe the working principle of full wave bridge rectifier. (8)

Or

(b) (i) Explain the V-I characteristics of zener diode in reverse bias. (8)

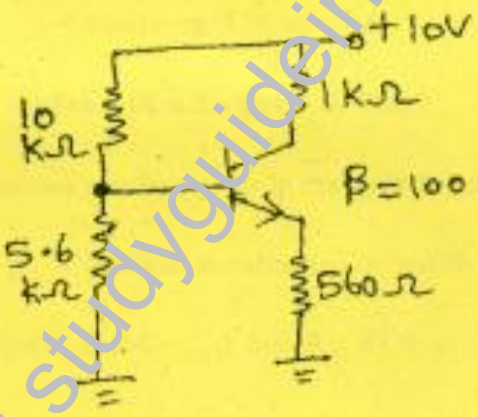
(ii) With necessary circuit and waveforms, describe the working principle of positive clipper. (8)

12. (a) (i) Explain the transistor switching times with neat waveforms. (8)

(ii) Describe the $V_{DS} - I_D$ characteristics of n-channel JFET. (8)

Or

(b) (i) In the following circuit, find the values of I_{BQ}, I_{CQ} and V_{CEQ}. (10)



(ii) Explain fixed biasing of JFET. (6)

13. (a) (i) Describe the frequency response of common emitter amplifier. (8)

(ii) Derive the expression for input impedance and voltage gain with feedback in a voltage-series negative feedback amplifier. (8)

Or

(b) Explain the construction and working principle of crystal oscillator and write the expression for frequency of oscillation in it. (16)

14. (a) Describe the construction, operation and characteristics of SCR. (16)

Or

(b) (i) Explain the working principle of UJT relaxation oscillator. (8)

(ii) Describe the principle of operation of any one type of LCD. (8)

15. (a) Explain the various steps involved in the fabrication of monolithic integrated circuit. (16)

Or

(b) (i) Draw the circuit of a voltage to current converter using op-amp and explain its operation. (8)

(ii) Describe the working principle of half wave precision rectifier. (8)

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