Paper ID [EE207]

(Please fill this Paper ID in OMR Sheet)

MAY 2008

B.Tech. (Sem. - 3rd)
ELECTRONIC DEVICES & CIRCUITS (EE - 207)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

1) Section - A is **Compulsory**.

2) Attempt any **Four** questions from Section - B.

3) Attempt any **Two** questions from Section - C.

Section - A

Q1) (10 × 2 = 20)

a) What is the effect of reverse bias on the width of a PN junction and why?

b) Give the continuity equation for electronics.

c) Differentiate between transition capacitance and diffusion capacitance of a PN junction diode.

d) Why is zener diode used as a voltage regulator?

e) Define α and β of a transistor and derive the relationship between them.

f) How transistor amplifies the input signal? Explain.

g) Explain why the operating point is fixed in the centre of the active region of a transistor characteristics.

h) Prove that the negative feedback in amplifiers increases the bandwidth of the amplifier.

i) Define CMRR of an operational amplifier giving its value for a typical Op-Amp.

j) What do you understand by temperature drift of input offset voltage.

Section - B

Q2) For silicon the intrinsic concentration is approximately 10^{16} carriers/m^3. If an impurity concentration of 10^{22} donor atoms/m^3 is doped, determine the electron and hole concentration.

Q3) Describe the V-I characteristics of a Schottky diode in detail.

Q4) Describe the circuits for half wave rectifier and full wave rectifier.

Q5) Explain the working of a common-emitter amplifier with the help of circuit diagram. Explain how load line is drawn for a common emitter amplifier.

Q6) Describe the ideal characteristics of an operational amplifier.

Section - C

(2 × 10 = 20)

Q7) Explain the working and characteristics of JFET. Define the parameters of a JFET and develop its equivalent circuit.

Q8) Explain the self bias and emitter bias circuit for a bipolar transistor. Derive the expression for stability factors for each.

Q9) Write short notes on the following:
  (a) Concept of oscillators.
  (b) Clippers and Clampers.

⊗ ⊗ ⊗ ⊗