

RR

Code: RR 100207

B.Tech I Year (RR) Supplementary Examinations, May 2012

ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE, ECE, CSE, EIE, BME, IT, E.Con.E, CSS and ECC)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions

All questions carry equal marks

- 1 Compare the motion and trajectories of electron when placed:
 - (a) Only in electric fields.
 - (b) Only in magnetic fields.
 - (c) In combined electric and magnetic fields.
- 2 (a) Define the following terms for a PN diode: (i) Dynamic resistance. (ii) Load line. (iii) Difference capacitance. (iv) Reverse saturation current.
(b) A reverse bias voltage of 90 V is applied to a Germanium diode through a resistance R. The reverse saturation current of the diode is $50 \mu\text{A}$ at an operating temperature of 250°C . Compute the diode current and voltage for: (i) $R = 10 \text{ M}\Omega$, (ii) $R = 100 \text{ M}\Omega$.
- 3 (a) Describe the functioning of a BJT in common base configuration.
(b) Determine the collector current of a BJT with both of its junctions reverse biased. Assume $I_{CO} = 5 \mu\text{A}$, $I_{EO} = 3.58 \mu\text{A}$, $\alpha_N = 0.98$ and any other parameter values as required.
- 4 Draw the circuit diagram of current series feedback amplifier and derive expressions for voltage gain and feedback factor.
- 5 Explain the working of UJT and SCR with a neat sketch.
- 6 Explain the working of Hartly and Colpits oscillator and derive the frequency of oscillation.
- 7 Explain the working of N-P-N transistor and mention its input-output characteristics.
- 8 Write a short note on the following:
 - (a) Energy band structure of semi-conductors.
 - (b) UJT.
