

R5

Code: R5 100207

B.Tech I Year (R05) Supplementary Examinations, May 2012

ELECTRONIC DEVICES AND CIRCUITS

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

Time: 3 hours

Max Marks: 80

Answer any FIVE questions

All questions carry equal marks

- 1 (a) What is Hall effect? Where it is used?
(b) Explain the principle of operation of CRT.
- 2 (a) Explain the formulation of potential barrier in a p-n junction why is silicon preferred to germanium in the manufacturing of semiconductor device.
(b) A germanium diode draws 50 mA with a forward bias of 0.27 V. The junction is at room temperature of 27°C. Determine the reverse saturation current of the diode.
(c) Write a short note on varactor diode.
- 3 (a) Derive expression for rectification efficiency ripple factor for half wave rectifier.
(b) State and explain the characteristics of a Zener diode. How it can be used as voltage regulator?
- 4 (a) Explain the input and output characteristics of a transistor in CB configuration.
(b) For the given N-channel JFET $I_{DSS} = 20 \text{ mA}$, $V_p = -8 \text{ V}$ and $g_{m0} = 5000 \mu\text{s}$. Determine the drain current and trans conductance at $V_{GS} = -4 \text{ V}$.
- 5 (a) Draw and explain the transistor a.c equivalent circuit.
(b) Write a note on biasing techniques of MOSFET.
- 6 (a) Draw the circuit diagram of a single-stage transistor amplifier. State the function of each component used in this circuit.
(b) Draw the circuit diagram of an R-C coupled amplifier. Explain the characteristics of gain v/s frequency.
- 7 (a) Draw the circuit diagram of common emitter without by-pass capacitor amplifier circuit. Explain that why it is called negative current feedback amplifier.
(b) Give the classification of feedback amplifier.
- 8 (a) What is Barkhausen criterion?
(b) Explain the operation of Colpit's oscillator with the help of a neat circuit diagram and derive expression for frequency of oscillation.
