

ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE, ECE & EIE)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 x 02 = 20 Marks)
- Define transformer utilization factor.
 - Define mass action law.
 - Define amplification factor.
 - What is pitch-off voltage?
 - What is DC load line?
 - Write the relation between S and S' .
 - Draw the h-parameter equivalent circuit for transistor.
 - Define input impedance.
 - State any two applications of LCD's.
 - State the disadvantages of LED.

PART – B
(Answer all five units, 5 x 10 = 50 Marks)**UNIT - I**

- 2 Draw and explain the energy band diagrams for extrinsic semiconductor.

OR

- 3 Explain the working of bridge rectifier. Give the expressions for RMS current, PIV, ripple factor and efficiency.

UNIT - II

- 4 Explain with the help of neat diagram the structure of an N-channel FET. In what ways it is different from a bipolar transistor.

OR

- 5 (a) Sketch and explain a family of CB output characteristics for a transistor.
(b) Indicate the active, cut-off and saturation regions. Explain the shapes of the curves qualitatively.

UNIT - III

- 6 (a) Derive the expression for I_C versus I_B for a CE transistor configuration in the active region.
(b) For $I_B = 0$, what is I_C .

OR

- 7 In the voltage divider bias circuit, if $V_{CC} = 10\text{ V}$, $V_{CE} = 5\text{ V}$, $I_C = 1.2\text{ mA}$, $R_2 = 10\text{ k}\Omega$, $\beta = 100$ and $R_E = 270\Omega$ calculate R_1 and R_3 . Assume $V_{BE(\text{active})} = 0.6\text{ V}$.

UNIT - IV

- 8 (a) Derive the expression for A_V in terms of A_I .
(b) In terms of the h parameters and the source resistance, derive the equation for the output admittance.

OR

- 9 Find h_{re} in terms of the CB h parameters.

UNIT - V

- 10 Sketch and curve of photodiode current as a function of the position of a narrow light source from the junction. Explain the shape of the curve.

OR

- 11 Sketch and explain the characteristics of the tunnel diode.
