



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

II B.Tech I Sem Supply End Examination, July-2022

Electronic Devices and Circuits**(ECE)****Max. Marks: 70**

- Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A**(10*2 Marks = 20 Marks)**

- | | | | | |
|-------|--|----|-----|------|
| 1. a) | Define and give expressions of (i) Static and (ii) Dynamic resistances | 2M | C01 | BL-1 |
| b) | Draw different diode equivalent circuits. | 2M | C01 | BL-2 |
| c) | Define the terms i) emitter ii) base iii) collector. | 2M | C02 | BL-1 |
| d) | Explain briefly DC load and AC load line | 2M | C02 | BL-3 |
| e) | Draw the depletion type MOSFET I-V characteristics | 2M | C03 | BL-4 |
| f) | Describe why the input impedance of FET is higher than BJT. | 2M | C03 | BL-2 |
| g) | Compare CB, CE, CC configurations in terms of input and output resistances. | 2M | C04 | BL-5 |
| h) | Write expressions of A_v , A_i , R_i , and R_o in terms of h-parameters | 2M | C04 | BL-1 |
| i) | Explain briefly the operation of SCR | 2M | C05 | BL-2 |
| j) | Draw the Small-Signal Model of JFET, and list parameters used to analyze the JFET amplifier. | 2M | C05 | BL-4 |

PART- B**(10*5 Marks = 50 Marks)**

- | | | | | |
|-----------|---|-----|-----|------|
| 2 | a) With reference to the rectifiers, explain the following terms and mention its values for full wave and half wave types of rectifiers:
i) Ripple Factor
ii) Efficiency
iii) Peak Inverse Voltage (PIV) | 10M | C01 | BL-5 |
| OR | | | | |
| 3 | With neat sketches discuss the operation of a Full Wave Rectifier & derive the expression for its ripple factor. | 10M | C01 | BL-5 |
| 4 | a) Illustrate the circuit diagram of the NPN transistor in the Common Emitter(CE) configuration. | 5M | C02 | BL-2 |
| | b) With neat sketches and necessary equations, describe CE static input-output characteristics and clearly indicate the cut-off, saturation & active regions on the output characteristics. | 5M | C02 | BL-5 |

OR

5 With a neat diagram explain the various current components in an NPN bipolar junction transistor & hence derive a general equation for collector current I_c 10M C02 BL-4

- 6 a) Comparison of BJT and FET, and list advantages and disadvantages of both. 5M C03 BL-5
b) Draw and explain drain and transfer characteristics of depletion type MOSFET. 5M C03 BL-5

OR

7 Explain the construction of JFET and the principle of operation using different current components. 10M C03 BL-3

- 8 a) Draw and discuss the circuit diagram & small-signal equivalent of CE amplifier using the accurate h-parameter model. 5M C04 BL-3
b) Explain the effect of coupling and bypass capacitors on CE 5M C04 BL-3

OR

9 Find the values of A_v , A_i , R_i and R_o for a bipolar junction transistor with $h_{ie} = 1100\Omega$, $h_{fe} = 50$, $h_{re} = 2.4 \times 10^{-4}$, $h_{oe} = 25 \mu A/V$, is to drive a load of $1K\Omega$ in CB amplifier arrangement. 10M C04 BL-4

- 10 a) Discuss the working principle of SCR and list applications. 5M C05 BL-6
b) Compare CS, CD, and CG configurations of FET amplifiers 5M C05 BL-5

OR

11 Explain the working principle of (i) Tunnel diode and (ii) UJT and list applications. 10M C05 BL-3

---oo0oo---