



II B.Tech I Sem Supply End Examination, October 2021
Electronic Devices and Circuits
(ECE)

Time: 3 Hours.**Max. Marks: 70**

Note: 1. Answer any FIVE questions.

2. Each question carries 14 marks and may have a, b as sub questions.

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|---|----|---|----|-----|-----|
| 1 | a) | Define i) cut in voltage ii) Peak inverse voltage
iii) Ripple factor iv) Transformer utilization factor
v) Rectifier efficiency vi) Form factor vii) Peak factor | 7M | C01 | BL1 |
| | b) | What is a rectifier? How many types are there? Explain half wave rectifier? | 7M | C01 | BL4 |
| 2 | a) | Explain the operation of full wave rectifier and sketch different wave forms. | 7M | C01 | BL4 |
| | b) | Explain about punch through and base width modulation. | 7M | C01 | BL4 |
| 3 | a) | Draw the circuit diagram of common emitter configuration and explain with I/P & O/P V.I Characteristics. | 7M | C02 | BL3 |
| | b) | Why biasing a transistor? Explain collector to base bias circuit and Obtain expression for its stability factor. | 7M | C02 | BL4 |
| 4 | a) | Define FET parameters and show that $\mu = g_m R_d$. | 7M | C02 | BL1 |
| | b) | An N-channel JFET has $I_{DSS} = 8 \text{ mA}$ and $V_P = -5 \text{ V}$. Determine the minimum value of V_{DS} for pinch-off region and the drain current I_{DS} , for $V_{GS} = -2 \text{ V}$ in the pinch region. | 7M | C03 | BL3 |
| 5 | a) | Explain self bias circuit and derive the expression for stability factor. | 7M | C03 | BL4 |
| | b) | Draw the circuit diagram of tunnel diode and its equivalent circuit and explain with half of energy level diagrams. | 7M | C03 | BL1 |
| 6 | a) | Derive the expression for voltage amplification (A_v) and current amplification (A_i) for CE amplifier. | 7M | C04 | BL6 |
| | b) | Sketch V-I. Characteristics of CE configuration and determine h-parameters. | 7M | C04 | BL3 |
| 7 | a) | For a CB amplifier driven by a voltage source of internal resistance $R_S = 1.2 \text{ K}\Omega$, the load resistance $R_L = 1.5 \text{ K}\Omega$, The h-parameters are $h_{ib} = 22 \Omega$, $h_{rb} = 3 \times 10^{-4}$, $h_{fb} = -0.98$ and $h_{ob} = 0.5 \mu\text{A/V}$. complete A_i , A_v , R_i and R_o . | 7M | C04 | BL3 |
| | b) | Sketch V-I. Characteristics of enhancement MOSFET and explain. | 7M | C05 | BL4 |
| 8 | a) | Derive the expression for A_v , Z_i and Z_o of CG FET amplifier. | 7M | C05 | BL6 |
| | b) | In CG amplifier $R_D = 2 \text{ K}\Omega$ $R_S = 1 \text{ K}\Omega$, $g_m = 1.43 \times 10^{-3} \text{ mho}$, and $r_d = 30 \text{ K}\Omega$. Determine A_v , Z_i and Z_o . | 7M | C05 | BL3 |