

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III EXAMINATION – SUMMER 2025****Subject Code:3134104****Date:06-06-2025****Subject Name:Electronic Devices and Circuits****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

| | | MARKS |
|-------------|---|--------------|
| Q.1* | (a) Explain Barrier Potential & Depletion Layer. | 03 |
| | (b) Draw & Explain Energy Band diagram for Conductor, Insulator and Semiconductor | 04 |
| | (c) Explain Intrinsic Semiconductor with its construction diagram and flow of current through it using holes and electrons. | 07 |
| Q.2 | (a) Define following in terms of Diode theory. | 03 |
| | 1. Knee Voltage | |
| | 2. Bulk Resistance | |
| | 3. Power Dissipation | |
| | (b) Draw and explain third approximation of Diode. | 04 |
| | (c) Explain Centre tapped Full wave Rectifier with its circuit diagram and waveforms. | 07 |
| OR | | |
| | (c) Explain Positive and Negative Clamper using its circuit diagram and wave forms. | 07 |
| Q.3 | (a) Compare Zener Breakdown and Avalanche Breakdown | 03 |
| | (b) Explain Schottky Diode. | 04 |
| | (c) Enlist various Optoelectronics devices. Explain any two with its construction. | 07 |
| OR | | |
| Q.3 | (a) Explain unbiased NPN Transistor. | 03 |
| | (b) Explain Transistor as a Switch. | 04 |
| | (c) What is Q point? Explain DC load line for CE transistor configuration. | 07 |
| Q.4 | (a) Explain Optocoupler. | 03 |
| | (b) Compare CB, CE and CC configuration of Transistor. | 04 |
| | (c) Explain Voltage Divider bias circuit for Transistor Biasing. | 07 |
| OR | | |
| Q.4 | (a) Explain the significance of Coupling Capacitor in AC biasing of Transistor | 03 |
| | (b) Explain Collector feedback bias method for transistor biasing. | 04 |
| | (c) Explain Complementary Symmetry pair class B Push Pull amplifier with its circuit diagram and waveforms. | 07 |
| Q.5 | (a) Explain Class A operation with circuit and waveforms. | 03 |
| | (b) Explain P Channel Enhancement type MOSFET. | 04 |
| | (c) Explain Drain curves for JFET with its all regions. | 07 |

OR

- Q.5** (a) Compare JFET and MOSFET. **03**
(b) Draw and explain 04 types of negative feedback configuration **04**
(c) Explain effect of Negative Feedback in Amplifier characteristics. **07**
