

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Advanced Supplementary Examinations March- 2025
BASIC ELECTRONICS

(Open Elective)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from Each unit

All Questions Carry Equal Marks

UNIT-I

1. a) Explain how p-n junction diode acts as a rectifier with appropriate circuit diagrams. [7M]
b) Draw the circuit diagram and explain the operation of half wave rectifier with input and output wave forms. [7M]

(OR)

2. a) Derive the conductivity equation for an N-type and P-type semiconductor. State mass-action law. [7M]
b) Compare half-wave, full-wave and bridge rectifiers with respect to various performance parameters. [7M]

UNIT-II

3. a) Distinguish between avalanche and Zener breakdown mechanisms. Name the p-n junction diodes which affect breakdown mechanisms. [7M]
b) Describe with the help of a relevant diagram the construction of a Light Emitting Diode and explain its working. List the applications of LED. [7M]

(OR)

4. a) Explain the operation of Zener diode with circuit diagram and characteristics. How it is different from an ordinary diode? [7M]
b) Explain the principle behind the varactor diode with neat sketch and list out its applications. [7M]

UNIT-III

5. a) Draw and explain the operation of Bipolar Junction Transistor with the help of potential barrier diagrams. [7M]
b) Explain how transistor acts as a switch with suitable circuit diagram and proper illustration. [7M]

(OR)

6. a) Define various parameters pertaining to current components of a Bipolar Junction Transistor and deduce the expression which gives the relation between them. [7M]
b) Explain the output characteristics of Bipolar Junction Transistor in CC configuration with respect to various regions of operation. [7M]

UNIT-IV

7. a) Explain the construction and operation of n-channel Junction Field Effect Transistor with suitable diagram. [7M]
b) Draw and explain the characteristics of depletion type MOSFET & also mention how the depletion MOSFET is differing from JFET. [7M]

(OR)

8. a) Draw and explain various JFET biasing methods, in brief. [7M]
b) Explain the construction and operation of n-channel enhancement MOSFET with neat sketch. [7M]

UNIT-V

9. a) Explain the two transistor analogy of an SCR. Once the SCR is triggered, how the gate loses its control. [7M]
b) Draw and explain the schematic representation of an optocoupler. List the applications of optocoupler? [7M]

(OR)

10. a) Explain V-I characteristics of a UJT. Define the terms peak point voltage and valley point voltage of a UJT. [7M]
b) Explain how triggering of an SCR can be controlled by the gate signal supplied. Define the terms firing angle and conduction angle of an SCR. [7M]
