

Subject Code: 24EC11RC04

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GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

(Affiliated to Andhra University, Visakhapatnam)

I B.Tech. - II Semester Regular Examinations, June / July – 2025

ELEMENTS OF ELECTRONICS ENGINEERING

(Common to CSE & IT)

1. All questions carry equal marks
2. Must answer all parts of the question at one place

Time: 3Hrs.

Max Marks: 70

UNIT-I

1. a. Differentiate between conductors, insulators, and semiconductors based on energy bands. [7M]
b. What is the total current in a semiconductor under both drift and diffusion mechanisms? [7M]

OR

2. a. Derive an expression for carrier concentration in intrinsic semiconductors. [7M]
b. How does conduction occur in conductors, semiconductors, and insulators? [7M]

UNIT-II

3. a. Sketch and explain the V-I characteristics of a PN junction diode. [7M]
b. Draw the circuit of a bridge rectifier without filter and explain its operation. [7M]

OR

4. a. Differentiate between transition capacitance and diffusion capacitance. [7M]
b. What is the role of a capacitor filter in a halfwave rectifier circuit with the help of circuit diagram? [7M]

UNIT-III

5. a. Draw the circuit and explain the operation of a BJT in Common Emitter (CE) configuration. [7M]
b. What are the three operating regions of a transistor? Explain each briefly. [7M]

OR

6. a. Analyze the input and output characteristics of a BJT in a Common Base (CB) configuration and discuss the effect of base width modulation. [7M]
b. How do biasing techniques prevent thermal runaway? [7M]

UNIT-IV

7. a. Draw the circuit diagram of a two-stage RC coupled amplifier and explain its working. [7M]
b. Derive the expressions for voltage gain, current gain, input and output resistance of a CE amplifier using h-parameters. [7M]

OR

8. a. Explain the small signal model of a transistor using h-parameters [7M]
b. Explain how gain changes in the low, mid, and high-frequency ranges in a two-stage amplifier. [7M]

UNIT-V

9. a. Define and explain the JFET parameters. [7M]
b. Draw and explain the construction of: n-channel Depletion MOSFET. [7M]

OR

10. a. Differentiate between Enhancement-mode and Depletion-mode MOSFETs [7M]
b. Draw and explain the transfer characteristics of N-Channel JFET. [7M]