

Reg. No:

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular & Supplementary Examinations March-2023

BASIC ELECTRONICS ENGINEERING

(Common to CSE, CSM, CAD, CAI, CCC, CSIT, CIC)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

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|---|---|---------------------------------------------------------------------------------------|-----|----|----|
| 1 | a | Explain in detail about mass action law. | CO1 | L2 | 6M |
| | b | Explain the 2-D representation of the Germanium crystal structure with a neat sketch. | CO1 | L2 | 6M |

OR

- | | | | | | |
|---|---|--------------------------------------------------------------------------|-----|----|----|
| 2 | a | Compare and contrast the electrical properties of Silicon and Germanium. | CO1 | L2 | 6M |
| | b | Explain diffusion current with expressions. | CO1 | L2 | 6M |

UNIT-II

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|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|----|
| 3 | a | Illustrate the action of PN junction diode under forward bias and reverse bias and sketch its V-I Characteristics. | CO1 | L3 | 8M |
| | b | A PN junction diode has a reverse saturation current of 30 μ A at a temperature of 1250 C. At the same temperature calculate the dynamic resistance for 0.2 V bias in forward and reverse direction. | CO1 | L4 | 4M |

OR

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|---|---|-----------------------------------------------------------------------------------------------------------------------------|-----|----|----|
| 4 | a | Define Transition and Diffusion capacitances of a PN junction Diode. | CO1 | L3 | 6M |
| | b | Calculate the forward resistance of a PN junction diode when the forward current is 5mA at T = 300 K. Assume Silicon diode. | CO1 | L4 | 6M |

UNIT-III

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|---|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|----|
| 5 | a | Draw the circuit diagram of a half wave rectifier and explain its operation. | CO1 | L1 | 6M |
| | b | Derive the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output, AC Power input and Efficiency of a Half Wave Rectifier. | CO2 | L3 | 6M |

OR

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|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|----|----|
| 6 | a | Define Filter and discuss various types of filters. | CO1 | L2 | 4M |
| | b | Draw the circuit diagram of Full wave rectifier with inductor filter and explain its operation. Also derive the expression for ripple factor. | CO2 | L3 | 8M |

UNIT-IV

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|---|---|----------------------------------------------------------------------------------------------------------|-----|----|----|
| 7 | a | Define Stability Factor S. Derive the expressions for the stability factors S, S' and S'' of a BJT bias. | CO2 | L2 | 6M |
| | b | Draw the Input and Output characteristics of a BJT in CB Configuration. | CO1 | L1 | 6M |

OR

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|---|---|-------------------------------------------------------------------------|-----|----|----|
| 8 | a | Derive the relation between α , β and Y of a Transistor. | CO1 | L3 | 6M |
| | b | Compare the configuration of CE, CB and CC. | CO1 | L2 | 6M |

UNIT-V

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|---|---|-------------------------------------------------------------------|-----|----|----|
| 9 | a | Classify the types of JFET and Draw its symbols. | CO1 | L2 | 4M |
| | b | Explain the construction and working principle of N-channel JFET. | CO1 | L2 | 8M |

OR

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|----|---|-----------------------------------------------------------------|-----|----|----|
| 10 | a | Explain construction and working principle of E-only MOSFET. | CO1 | L2 | 8M |
| | b | Sketch the transfer and drain characteristics of E-only MOSFET. | CO1 | L2 | 4M |

*** END ***

SRINIVASA INSTITUTE OF ENGINEERING & TECHNOLOGY - PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular & Supplementary Examinations March-2023

BASIC ELECTRONICS ENGINEERING
(Common to ESE, ECE, CAD, CAG, CCG, CSM)

158

Max. Marks: 60

Time: 3 hours

(Answer all Parts, parts 2 x 12 = 24 Marks)

UNIT-I

- 1 a Explain the drift and diffusion processes.
- b Explain the E-D representation of the continuous crystal structure with a neat sketch.

OR

- 2 a Compare and contrast the electrical properties of Silicon and Germanium.
- b Explain diffusion current with expressions.

UNIT-II

- 3 a Illustrate the action of PN junction diode under forward bias and reverse bias and sketch its V-I Characteristics.
- b A PN junction diode has a reverse saturation current of 30 μ A at a temperature of 35°C. At the same temperature calculate the dynamic resistance for 0.5 V bias in forward and reverse direction.

OR

- 4 a Define Zener diode and draw the characteristic of a PN junction diode.
- b Explain the forward resistance of a PN junction diode when the forward current flows at $I = 100$ A - assume silicon diode.

UNIT-III

- 5 a Draw the circuit diagram of a half wave rectifier and explain its operation.
- b Derive the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output, AC Power Input and Efficiency of a Half Wave Rectifier.

OR

- 6 a Define Filter and discuss various types of filters.
- b Draw the circuit diagram of Full wave rectifier with inductor filter and explain its operation. Also derive the expression for ripple factor.

UNIT-IV

- 7 a Define stability factor S. Derive the expressions for the stability factor S₁ and S₂ of a BJT bias.
- b Draw the Input and Output characteristics of a BJT in CB Configuration.

OR

- 8 a Derive the relation between α and β of a Transistor.
- b Compare the configuration of CE, CB and CC.

UNIT-V

- 9 a Classify the types of JFET and draw its symbols.
- b Explain the construction and working principle of N-channel JFET.

OR

- 10 a Explain construction and working principle of E-only MOSFET.
- b Sketch the transfer and drain characteristics of D-only MOSFET.