Course Code: 23EC5E01

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

**(AUTONOMOUS)**

***III - B.Tech I-Semester Regular Examinations (BR23), Nov/Dec - 2025***

**ELECTRONIC DEVICES AND CIRCUITS (CSE AI&DS, AI&ML)**

Time: 3 hours | Max. Marks: 70

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*Question Paper consists of Part-A and Part-B*
*Answer **ALL** the question in **Part-A andPart-B***

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PART–A (10X2 = 20M)

| | | Marks | CO | BL |
|---|---|---|---|---|
| 1. a) | Write continuity equation? | (2M) | CO1 | BL1 |
| b) | What is zener break down ? | (2M) | CO1 | BL1 |
| c) | What is an LED? Write applications of LED? | (2M) | CO2 | BL1 |
| d) | What are the advantages of bridge rectifier over full wave rectifier? | (2M) | CO2 | BL1 |
| e) | Why n channel MOSFET Preffered over p channel MOSFET? | (2M) | CO3 | BL1 |
| f) | What is early effect? | (2M) | CO3 | BL1 |
| g) | What is the need of transistor biasing? | (2M) | CO4 | BL1 |
| h) | What is thermal runaway and thermal stability? | (2M) | CO4 | BL1 |
| i) | Write the advantages h parameters? | (2M) | CO5 | BL1 |
| j) | Compare CB.CC.CE amplifier configurations? | (2M) | CO5 | BL2 |

PART–B (5X10 = 50M)

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| 2a. | Define hall effect ?Derive an expression for hall coeffient for a semiconductor material. | 5(M) | CO1 | BL3 |
| b. | Give the mathematical analysis of Fermi level lies in the centere of forbidden energy band for an intrinsic semi conductor | 5(M) | CO1 | BL4 |
| | (OR) | | | |
| 3a. | Derive expression for contact potential in open circuit PN junction Diode? | 6(M) | CO1 | BL3 |
| b. | Explain the characteristics of PN junction diode in both forward and reverse bias? | 5(M) | CO1 | BL2 |
| 4a. | Explain the operation of tunnel diode with necessary diagrams? | 5(M) | CO2 | BL2 |
| b. | Discuss principle and operation of silicon controlled rectifier with its characteristics. | 5(M) | CO2 | BL2 |
| | (OR) | | | |
| 5a. | Derive an expression for ripple factor and efficiency of full wave full wave rectifier. | 5(M) | CO2 | BL4 |

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| b. | Draw the circuit diagram of LC filter and derive its ripple factor. | 5(M) | CO2 | BL3 |

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| 6a. | Draw and explain the input and output characteristics of BJT In Common emitter configuration | 5(M) | CO3 | BL3 |
| b. | Explain EBERS MOL MODEL OF Transistor | 5(M) | CO3 | BL2 |
| | (OR) | | | |
| 7a. | Explain the construction and characteristics FET? | 5(M) | CO3 | BL3 |
| b. | Comparison between MOSFET and JFET. | 5(M) | CO3 | BL |

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|---|---|---|---|---|
| 8a. | Explain need for biasing in electronic circuits .what are the factors effecting stability factor. | 5(M) | CO4 | BL2 |
| b. | Why self bias technique is so popular? and derive an expression for stability factor. | 5(M) | CO4 | BL3 |
| | (OR) | | | |
| 9a. | Explain FET biasing methods | 5(M) | CO4 | BL2 |
| b. | Draw AC load line and DC load line of a transistor? And determine operating point of transistor. | 5(M) | CO4 | BL3 |

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| 10a. | Derive an expression for voltage gain current gain ,input impedence,output admittance with respect source and current gain, with respect generalized transistor amplifier at low frequencies. | 10(M) | CO5 | BL4 |
| | (OR) | | | |
| 11a. | Using approximate h parameter model of CE obtain the expression for i)AI ii)RI iii)AV iv)RO | 6(M) | CO5 | BL3 |
| b. | Give the comparison of transistor as amplifiers. | 4(M) | CO5 | BL2 |

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