



ADITYA UNIVERSITY

B.Tech – I Semester End Examinations Supplementary – Dec 2025

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (Common to CE, ME, ECE, CSE & Min.E)

Time: 3 hours

Max. Marks: 100

Answer ONE question from each unit

All Questions Carry Equal Marks

All parts of the questions must be answered at one place only

UNIT-I

- 1 a Illustrate the following laws, with neat sketches. i) Kirchhoff's current law ii) Kirchhoff's Voltage law. L2 CO1 [10M]
b Express the following terms i) Amplitude ii) Phase angle for a sinusoidal waveform with suitable expression. L2 CO1 [10M]

(OR)

- 2 a Explain the series connection of resistors and voltage divider rule. L2 CO1 [10M]
b Define the terms i) Form Factor ii) Peak Factor iii) Apparent Power iv) power factor. L1 CO1 [10M]

UNIT-II

- 3 a Explain with the help of a sketch, the constructional features of a DC machine. L2 CO2 [10M]
b Illustrate the operation of Moving Coil Instrument (PMMC) with neat Sketch. L2 CO2 [10M]

(OR)

- 4 a Explain any two types of Single phase Induction Motors. L2 CO2 [10M]
b Compare and Contrast the Moving Coil and Moving Iron Instruments L1 CO2 [10M]

UNIT-III

- 5 a Explain the Layout and operation of the Hydro power plants with neat diagrams. L2 CO3 [10M]
b Distinguish between Conventional and nonconventional energy resources with examples. L2 CO3 [10M]

(OR)

- 6 a Illustrate the operation of the Wind power generation with neat diagrams. L2 CO3 [10M]
b Explain the working principle of Fuse, Miniature Circuit Breaker, with neat sketches. L2 CO3 [10M]

UNIT-IV

- 7 a Explain the V-I characteristics of a PN junction diode. Discuss forward and reverse bias, breakdown mechanisms. L2 CO4 [10M]
b Describe the input and output characteristics of BJT under common emitter configuration with necessary characteristic curves. L2 CO4 [10M]

(P.T.O)

(OR)

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|---|---|-------------------------------------------------------------------------------------------------|----|-----|-------|
| 8 | a | With the schematic and symbolic diagram of NPN and PNP transistor and describe their operation. | L2 | CO4 | [10M] |
| | b | Draw the schematic of CB, CC, CE configurations of BJT and analyze their performances. | L2 | CO4 | [10M] |

UNIT-V

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|---|---|-------------------------------------------------------------------------------------------|----|-----|-------|
| 9 | a | Describe half-wave and full-wave rectifiers. Explain their operation with neat waveforms. | L2 | CO5 | [10M] |
| | b | Discuss binary, octal, decimal, and hexadecimal systems with suitable examples. | L2 | CO5 | [10M] |

(OR)

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|----|---|---------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-------|
| 10 | a | Derive expressions for the DC output voltage of half-wave, full-wave, and bridge rectifiers, and compare their performance characteristics. | L3 | CO5 | [10M] |
| | b | Explain in detail all basic logic gates: AND, OR, NOT. Draw the logic symbol, truth table. | L2 | CO5 | [10M] |
