



First Second Semester B.E. Degree Examination, June/July 2025

## Basic Electronics

Max. Marks: 100

## Module-1

- 1 a. Explain the working of PN junction diode under forward and reverse bias condition. (06 Marks)
- b. Explain with a neat diagram and waveform, the working of full wave bridge rectifier. (08 Marks)
- c. Explain equivalent circuit of diode with necessary diagram. (06 Marks)

OR

- 2 a. Show that the efficiency of full wave bridge rectifier is 81.2%. (06 Marks)
- b. Explain how zener acts as voltage regulator. (06 Marks)
- c. Explain the working of half wave with and without capacitor filter with necessary waveforms. (08 Marks)

## Module-2

- 3 a. Explain drain and transfer characteristics of JFET with necessary diagram. (10 Marks)
- b. Explain the construction and working of enhancement type MOSFET. (10 Marks)

OR

- 4 a. Explain the V-I characteristics of SCR with necessary waveform. (10 Marks)
- b. Explain digital circuit applications of CMOS. (10 Marks)

## Module-3

- 5 a. Define the terms : (10 Marks)
  - i) Voltage follower
  - ii) Virtual ground
  - iii) CMRR
  - iv) Slewrate
  - v) Input bias current.
- b. Explain the operation of an OPAMP an inverting amplifiers and write the necessary output waveform  $V_0$  for an input  $V_{in} = 1V$  and gain  $A_v = 10$ . (10 Marks)

OR

- 6 a. Explain how OPAMP can be used as integrator and differentiator with necessary waveform. (10 Marks)
- b. Explain the operation of an adder circuit to meet the equation  $V_0 = -[V_1 + V_2 + V_3]$ . (10 Marks)

## Module-4

- 7 a. Explain the properties and advantages of negative feedback amplifier. (10 Marks)
- b. Explain the working principle of phase shift oscillator with necessary diagram. (10 Marks)

OR

- 8 a. List out the classification of oscillator. (08 Marks)
- b. Explain the operation of IC555 as astable oscillator with necessary diagram, and waveform and also derive its charging and discharging time of the circuit. (12 Marks)

## Module-5

- 9 a. Find :
  - i)  $(1101011101101010)_{16} = (?)_8$
  - ii)  $(EB986)_{16} = (?)_8$
  - iii)  $(925.75)_{10} = (?)_2$
  - iv)  $(745.36)_8 = (?)_{10}$
  - v) Subtract  $(10101)$  from  $(101010) = (?)_{10}$  (10 Marks)
- b. What is flip flop? Explain the operation of master-slave JK flip flop. (10 Marks)

OR

- 10 a. Explain the basic elements of communication system with block diagram. (10 Marks)
- b. Prove that
  - i)  $\overline{A + B + C} = \overline{A} \cdot \overline{B} \cdot \overline{C}$
  - ii)  $\overline{ABC} = \overline{A} + \overline{B} + \overline{C}$  (10 Marks)

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