



First/Second Semester B.E. Degree Examination, June/July 2024
Basic Electronics and Communication Engineering

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Describe various electronic units of a d.c. power supply with a neat block diagram. (07 Marks)
- b. Derive an expression for overall gain of an amplifier with negative feedback. (07 Marks)
- c. Illustrate single-stage astable multivibrator using operational amplifier and explain the threshold voltages. (06 Marks)

OR

- 2 a. With neat block diagram and waveforms, explain the working of bridge rectifier. (08 Marks)
- b. Explain the working of op-amp comparators and summing amplifiers with input and output waveforms. (08 Marks)
- c. A 5 V zener diode has a maximum rated power dissipation of 500 mW. If the diode is to be used in a simple regulator circuit to supply a regulated 5 V to a load having resistance of $400\ \Omega$; determine a suitable value of series resistor for operation in conjunction with a supply of 9 V. (04 Marks)

Module-2

- 3 a. With the help of truth table and logic expressions, explain full adder using basic gates. (08 Marks)
- b. Discuss the design of a 3-bit asynchronous up-counter. (07 Marks)
- c. Write a note on different data types mentioning the bit size and range of values supported. (05 Marks)

OR

- 4 a. Design a 3-to-8 Decoder and show its implementation using basic gates. (07 Marks)
- b. With the help of timing diagram, explain how D-type bistable circuit works. (06 Marks)
- c. With a neat block diagram, show how typical input and output blocks are connected to a microcontroller unit. (07 Marks)

Module-3

- 5 a. Differentiate : Embedded systems versus General computing systems. Also provide major application areas of Embedded Systems. (08 Marks)
- b. Discuss arrangement of an instrumentation system and a control system. (06 Marks)
- c. Illustrate topology for USB device connection. Also, classify four different data transfers supported by USB. (06 Marks)

OR

- 6 a. Explain the principle of operation, working and applications of stepper motor. (08 Marks)
- b. With relevant diagrams, explain the operation of Relay. (06 Marks)
- c. Write a note on classification of Embedded systems. (06 Marks)

Module-4

- 7 a. Draw a block schematic diagram of the most general form of basic communication system and explain. (08 Marks)
- b. Explain different types of radio wave propagation with a neat diagram. (06 Marks)
- c. Differentiate : (i) Amplitude modulation versus Frequency modulation. (06 Marks)
- (ii) Analog modulation versus Digital modulation.

OR

- 8 a. Explain PAM, PWM, PPM and PCM with the help of waveforms. (08 Marks)
- b. Discuss Forward Error Correction (FEC) technique. With neat diagram and example. (07 Marks)
- c. Define an antenna and discuss various types of antennas. (05 Marks)

Module-5

- 9 a. Draw the schematic diagram of cellular telephone system and define its basic components. (06 Marks)
- b. Draw the block diagram, showing the basic elements of a satellite communication system and briefly explain. (08 Marks)
- c. With the help of block diagram, explain generalized configuration of a fiber-optic communication system. (06 Marks)

OR

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- 10 a. With a neat block diagram, explain GSM system architecture. (08 Marks)
- b. With the help of architecture figure, explain the evolution from GSM to LTE. (08 Marks)
- c. What is Bluetooth? Explain Bluetooth architecture. (04 Marks)

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