

CBCS SCHEME

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21ELN14/24

First/Second Semester B.E. Degree Examination, Jan./Feb. 2023 Basic Electronics and Communication Engineering

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Suggest a circuit that converts ac to dc in which two diodes conducts in the positive half cycle as well as negative half cycle and reduces the ripples. Show all the relevant waveforms. (07 Marks)
- b. A wideband operational amplifier has a slew rate of $20\text{V}/\mu\text{s}$. If the amplifier is used in a circuit with a voltage gain of 30 and input of 50mV is applied to its input, determine the time taken for the output to change level. (06 Marks)
- c. Write the circuit of a sinewave oscillator in which 180° phase shift provided by RC ladder network and another 180° by the transistor. Determine the frequency of oscillations of the above circuit in which $C = 5\text{nF}$ and $R = 25\text{K}\Omega$. (07 Marks)

OR

- 2 a. Write a circuit which regulates the output voltage using zener. If a 10V zener diode has a maximum rated power dissipation of 6.00mw . If the diode is to be used in a simple regulator circuit having a resistance of 600Ω . Determine a suitable value of series resistor for operation in conjunction with a supply voltage of 20V . (08 Marks)
- b. An amplifier with a negative feedback applied has an open-loop voltage gain of 100 and one-twentieth of its output is feedback to the input. Determine the overall voltage gain with negative feedback applied. (06 Marks)
- c. Write the operational amplifier circuit in which the output is differentiation of the input signal. If the input in sine signal, write the resulting output waveform. (06 Marks)

Module-2

- 3 a. Write the 5 stage binary counter using JK bistable circuits. (07 Marks)
- b. Illustrate the input and output states of JK bistable circuit under the following conditions:
i) Preset and clear input ii) Clocked operation. (06 Marks)
- c. Implement a 3 to 8 decoder circuit using basic gates. (07 Marks)

OR

- 4 a. Describe the microcontroller system with typical inputs and outputs. (06 Marks)
- b. Represent the 5 bit shift register circuit and explain the working for the input data 10110. (10 Marks)
- c. Show the implementation of a 4 to 1 Mux. (04 Marks)

Module-3

- 5 a. Bringout the difference between Harvard and Von-Neumann processor. (08 Marks)
- b. Describe the working principle of 7 segment LED display. (08 Marks)
- c. Give 4 examples for serial communication interfaces. (04 Marks)

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, $42+8=50$, will be treated as malpractice.

OR

- 6 a. Illustrate the instrumentation and control system. (10 Marks)
b. Describe the working principles behind 3 input and 3 output transducer. (10 Marks)

Module-4

- 7 a. Represent the analog transmitter and receiver section in a communication system. (10 Marks)
b. Explain the concept of multiple access techniques in a wireless communication system. (10 Marks)

OR

- 8 a. Define the following: i) AM ii) FM iii) PAM iv) PWM v) PPM. (10 Marks)
b. Describe multipath and fading effect in a wireless communication system. (10 Marks)

Module-5

- 9 a. Represent a cellular telephone system and concept of frequency reuse. (10 Marks)
b. Describe the features of GEO and LEO satellites. (10 Marks)

OR

- 10 a. Briefly explain the GSM architecture. (10 Marks)
b. Represent the frequency modulated microwave communication system and explain. (10 Marks)
