

**BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT**

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Second Semester B.E. Degree Examinations, Oct/Nov 2023  
**INTRODUCTION TO ELECTRONICS ENGINEERING**

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO: PO: PI)</u>
<b>MODULE – 1</b>			
1.	a. Define Passive elements. Explain the role of R, L and C Components in Electronic Circuit.	6	(2:1:1.3.1)
	b. With VI Characteristics, explain how Zener Diode can be used as a voltage regulator.	6	(2:1:1.3.1)
	c. Define Rectifier. Explain the operation of Halfwave rectifier with capacitor filter with neat circuit diagram and waveforms.	8	(2:1:1.3.1)
<b>OR</b>			
2.	a. Explain the operation of PN junction Diode under No bias, Forward Bias and Reverse Biased Condition with VI Characteristics.	8	(2:1:1.3.1)
	b. Explain the operation of Bridge full wave rectifier with neat circuit diagram and waveforms.	6	(2:1:1.3.1)
	c. With a neat block diagram, explain the working of DC power supply.	6	(2:1:1.3.1)
<b>MODULE – 2</b>			
3.	a. With a neat block diagram, explain negative feedback amplifier. Derive the voltage gain equation for negative feedback Amplifier.	6	(2:4:1.3.1)
	b. Explain RC phase shift oscillator with circuit diagram and necessary equations.	6	(2:4:1.3.1)
	c. Define the following terms with respect to OPAMP	8	(1:4:1.3.1)
	i). CMRR		
	ii). Input offset voltage and Output offset voltage		
	iii). Input offset and Input bias Current		
	iv). Slew Rate		
<b>OR</b>			
4.	a. List and explain the different types of amplifiers.	6	(2:4:1.3.1)
	b. Explain the Barkhausen's criteria for oscillations.	6	(2:4:1.3.1)
	c. Derive an expression for the output voltage of an OPAMP Integrator and Differentiator	8	(3 :4:1.3.1)
<b>MODULE – 3</b>			
5.	a. Explain Full adder. Implement full adder using 2 half adder and an OR gate.	8	(2:3: 1.3.1)

b. Simplify the following expression 6 (3:3:1.3.1)

i).  $\overline{AB + \bar{A} + AB}$

ii).  $AB + \overline{AC} + A\bar{B}C(AB + C)$

c. Explain Clocked SR flip flop using NAND gates. 6 (2:3:1.3.1)

**OR**

6. a. Subtract  $(35)_{10}$  from  $(12)_{10}$  using 1's and 2's complement method. 6 (3:3:2.4.1)

b. State and prove De-morgans theorem of 2 variables. 4 (3:3:1.3.1)

c. Define shift register. Explain SIPO Shift register 4 (2:3:1.3.1)

d i) Convert from SOP to canonical SOP:  $f = A\bar{B} + A\bar{C} + BC$  6 (3:3:1.3.1)

ii) Convert from POS to canonical POS:  $f = (A + \bar{B}). (\bar{B} + C)$

**MODULE – 4**

7. a. Bring out the differences between RISC and CISC. 6 (2:4:1.3.1)

b. With a neat block diagram explain the elements of an embedded system. 6 (2:4:1.3.1)

c. Explain instrumentation and control system with a neat block diagram. 8 (2:4:1.3.1)

**OR**

8. a. Compare Embedded systems and general computing systems. Also provide major application areas of embedded system. 8 (2:4:1.7.1)

b. Explain the different configurations of the 7-segment LED display. 6 (2:4:1.7.1)

c. Write a note on Sensors and Actuators. 6 (2:4:1.7.1)

**MODULE – 5**

9. a. Describe the blocks of basic communication system with neat block diagram. 6 (2:5:1.3.1)

b. Explain with neat diagram the concept of radio wave propagation and its different types. 8 (2:5:1.3.1))

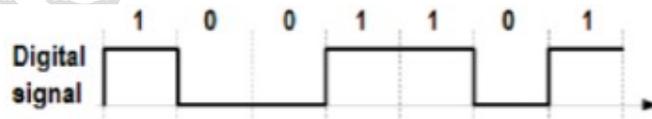
c. Define Amplitude Modulation. With the help of waveforms, explain amplitude modulation. 6 (2:5:1.3.1)

**OR**

10. a. List out the advantages of digital communication over analog communication. 6 (1:5:1.3.1)

b. Describe about radio signal transmission and multiple access techniques. 6 (2:5:1.3.1)

c. Consider the following binary data and sketch the ASK, FSK & PSK modulated Waveforms. 8 (2:5:1.3.1)



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