U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

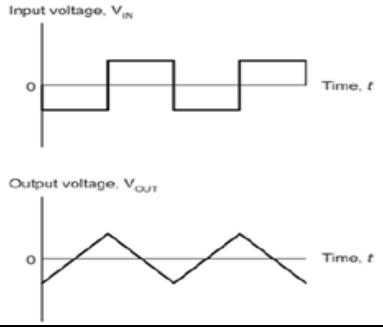
February / March 2025 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22EC1ESIEL / 22EC2ESIEL **Max Marks: 100**
Course: Introduction to Electronics Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Choice is in Unit I and III.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	The R–C smoothing filter in a 50 Hz mains operated half-wave rectifier circuit consists of R1 = 100 Ω and C 2 = 1,000 μF. If 1 V of ripple appears at the input of the circuit, determine the amount of ripple appearing at the output.	*CO1*	*PO1*	**5**
	b)	It is required to increase the voltage of a halfwave rectifier from 'V' to '2V' volts. Determine the kind of circuit that will provide this functionality and explain its working with the help of a neat diagram.	*CO1*	*PO1*	**5**
	c)	Explain with the help of a circuit diagram the operation of a Zener diode voltage regulator.	-	-	**10**
		OR			
2	a)	Identify and list the various regions of operation of a BJT.	*CO1*	*PO1*	**2**
	b)	The following measurements were made during a test on an amplifier: Vin = 200 mV, Iin = 1.5 mA, Vout = 8 V, Iout = 350 mA Determine: (a) the voltage gain (in dB); (b) the current gain (in dB); (c) the power gain (in dB); (d) the input resistance. If the voltage gain of the amplifier increases by 30%, find the value of Vout for the same input voltage?	*CO1*	*PO1*	**10**
	c)	With a neat diagram, explain the input and output characteristics of a transistor in common emitter configuration.	-	-	**8**
		UNIT - II			
3	a)	Analyze the input and output waveforms shown in the figure below. Identify the appropriate circuit used to obtain the output waveform from the input waveform and explain the same.	*CO2*	*PO2*	**5**

						
		b)	Draw the circuit diagram of an OPAMP Summing and Difference Amplifiers and explain each one of them.	-	-	**8**
		c)	Draw and explain the OPAMP Ladder Network Oscillator.	-	-	**7**
			OR			
	4	a)	What is an Oscillator and analyze the conditions for Oscillations	***CO2***	***PO2***	**5**
		b)	Draw the circuit diagram of an OPAMP Differentiator and Integrator and explain each one of them.	-	-	**8**
		c)	Draw and explain the OPAMP Wien bridge Oscillator	-	-	**7**
			UNIT - III			
	5	a)	Perform the following conversions: (a) $(1.00011)_2$ = ( )$_8$ = ( )$_{16}$ (b) $(25EC.6A7)_{16}$ = ( )$_2$ = ( )$_{10}$	***CO1***	***PO1***	**8**
		b)	Write the truth table for a 4-input system that indicates "TRUE" when majority of its inputs are "TRUE". Write the SOP expression / canonical minterm expression.	***CO2***	***PO2***	**6**
		c)	Implement Boolean expression for EX-NOR gate ($AB+\bar{A}\bar{B}$) using NOR Gate	***CO1***	***PO1***	**6**
			OR			
	6	a)	Find the complement of the functions F1 = $\bar{x}y\bar{z} + \bar{x}\bar{y}z$ and F2 = = x ($\bar{y}\bar{z} + yz$), by applying DeMorgan's theorems	***CO1***	***PO1***	**4**
		b)	What characteristics identify a combinational circuit? Explain a Half-adder using a Truth Table. Provide the gate level implementation for the same.	***CO2***	***PO2***	**10**
		c)	Simplify (a) Y = $\bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + AB\bar{C}$ (b) Y = $(A + C)\ (AD + A\ \bar{D}\ ) + AC + C$	***CO1***	***PO1***	**6**
			UNIT - IV			
	7	a)	Compare RISC and CISC Processors/Controllers	-	-	**6**
		b)	Identify the appropriate input or output transducer in the following situations (name & distinguish them) and describe the working principle [physical quantity]: i) Dairy Industry (Milk production – pasteurization) ii) Automotive Car Audio System Control iii) Automotive Car Seat Adjustment System	***CO2***	***PO2***	**6**
		c)	Explain the various Classification of Embedded Systems.	-	-	**8**

			OR			
	8	a)	Comment on Von Neumann and Harvard Architectures with relevant figures.	-	-	**6**
		b)	To display 2022 in a seven-segment, how many 7-segment displays are required? And also write the Binary and hexadecimal equivalent code for each.	***CO2***	***PO2***	**8**
		c)	Define actuator and discuss briefly the LEDs.	-	-	**6**
			UNIT - V			
	9	a)	Explain the concept of cellular communication system.	-	-	**10**
		b)	Identify briefly explain the common network topologies.	-	-	**5**
		c)	List networks characterized by their physical capacity or organizational purpose. Very briefly explain each one.	-	-	**5**
			OR			
	10	a)	Define Noise in communication system. Explain the various key parameters used to measure the quality of the received signal?	-	-	**8**
		b)	Explain different modulation techniques with neat waveforms?	-	-	**12**