U.S.N.										

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

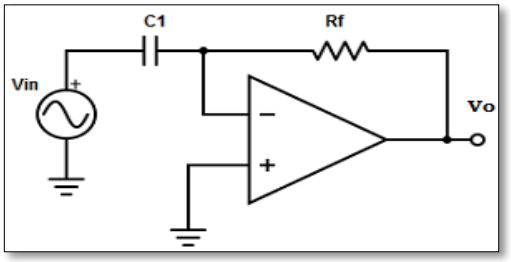
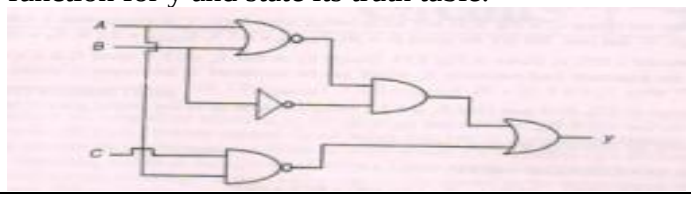
Autonomous Institute Affiliated to VTU

February / March 2024 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.

			UNIT - I	CO	PO	Marks
1	a)		What is Regulated power supply? Explain with block diagram.	-	-	**6**
	b)		Define Amplifier. List the types of Amplifiers.	-	-	**7**
	c)		Deduce the relationship between various Transistor current and also α and β of a transistor. In a common emitter transistor circuit, if $\beta = 100$ and $I_B = 50\mu A$, compute the values of α, I_E and I_C.	*CO1*	*PO1*	**7**
			OR			
2	a)		Explain voltage regulator circuit using Zener diode.	-	-	**6**
	b)		Explain the working of Full - Wave Bi-Phase Rectifier with circuit diagram and wave form.	-	-	**7**
	c)		An amplifier produces an output voltage of 2 V for an input of 50 mV. If the input and output currents in this condition are, respectively, 4 mA and 200 mA, determine: (a) the voltage gain; (b) the current gain; (c) the power gain.	*CO1*	*PO1*	**7**
			UNIT - II			
3	a)		State the characteristics of an Ideal Op-Amp. How do the characteristics of a practical Op-Amp differ from those of the ideal Op-Amp.	-	-	**5**
	b)		Explain Ladder Network Oscillator with circuit diagram and relevant expression. Design a ladder network oscillator that uses three RC sections, R = 10 KΩ. If the oscillator is to generate frequencies in the range from 1KHz to 100 KHz, what should be the range of C?	*CO1*	*PO1*	**10**
	c)		Identify the circuit shown in figure. When a sine wave of 1v Peak at 1000Hz is applied to the circuit with the following specification: RF =1kΩ and C1=0.33μF, find its output waveform and its output equation.	*CO2*	*PO2*	**5**

						
			UNIT - III			
	4	a)	State and prove duality theorem	***CO1***	***PO1***	**5**
		b)	Analyze the logic circuit shown in fig. Determine the Boolean function for y and state its truth table. 	***CO2***	***PO2***	**5**
		c)	Simplify the following functions i)$F = \bar{A}B + \bar{A}C + BC + A\bar{B}C$ ii)$F = \bar{A}B\bar{C} + \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}C$ iii)F = xy′ + x′y′z + xyz′ iv) X = a'b'c' + a'bc' + a'bc + ab'c + abc'	***CO1***	***PO1***	**10**
			OR			
	5	a)	Discuss the universality of NAND and NOR gates	***CO1***	***PO1***	**5**
		b)	The rocket motor of an air-launched missile with three inputs (launch, Unsafe- height and target-lock), will operate if and only if any two inputs are high. Implement a suitable logic circuit with minimum logic gates	***CO2***	***PO2***	**5**
		c)	Simplify the following Boolean expression using Boolean Laws and Realize this expression with logic gates of your choice (i) $f(A,B,C) = A\bar{B}\ C + \bar{C} + BC$ (ii) $f(A,B,C) = \overline{\overline{AB} + \bar{B} + \overline{CA}}$	***CO1***	***PO1***	**10**
			UNIT - IV			
	6	a)	Explain the different configurations of 7-segment LED Display.	-	-	**10**
		b)	Explain the classification of embedded systems based on generation, complexity, deterministic behavior, triggering and performance requirements.	-	-	**10**
			UNIT - V			
	7	a)	Explain the different types of modulation techniques with relevant Waveforms. Mention the modulation index of AM and FM wave.	-	-	**10**
		b)	Calculate the Carrier swing, frequency deviation and modulation index for an FM signal which reaches a maximum frequency of 99.047MHz and a minimum frequency of 99.023 MHz. The frequency of the modulating signal is 7KHz.	***CO1***	***PO1***	**4**
		c)	Discuss various network topologies commonly used in computer communication networks.	-	-	**6**

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