U.S.N.										

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

Autonomous Institute Affiliated to VTU

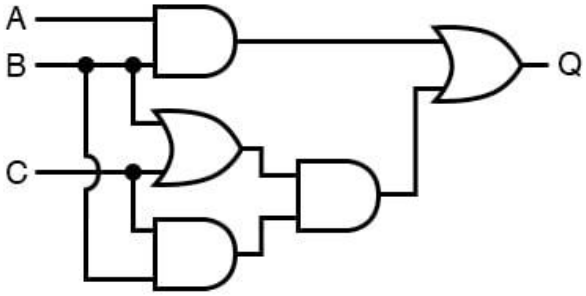
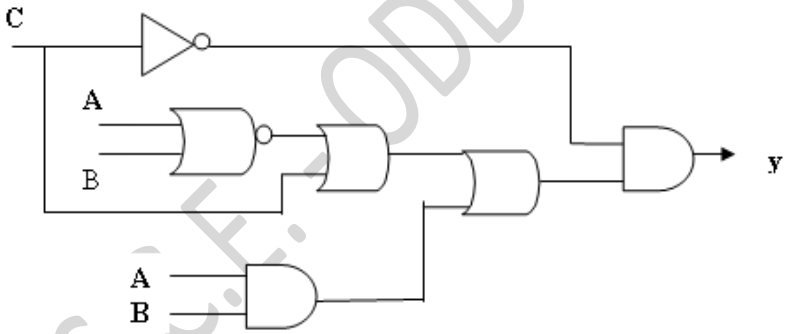
February / March 2024 Semester End Main Examinations

Programme: B.E. **Semester: I / II**
Branch: Common to all Branches **Duration: 3 hrs.**
Course Code: 22EC1ESBEC / 22EC2ESBEC **Max Marks: 100**
Course: Basic Electronics

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

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)		What is Regulated power supply? Explain with block diagram.	-	-	5
	b)		Derive the expression for Ripple factor and efficiency of Bridge rectifier.	CO1	PO1	10
	c)		The saturation current density of a PN junction Ge diode is 250mA/m^2 at 300^0K.Find the voltage that must be applied across junction to cause forward current density of 10^5A/m^2 to flow	CO1	PO1	5
			OR			
2	a)		A sinusoidal wave of V=600sin30t is applied to a half wave rectifier. The load resistance is 2KΩ and forward resistance of the diode is 60Ω. Find **1.** DC current trough the Diode **2**.RMS value of current trough the circuit **3.** DC output voltage **4.**AC power input **5.** DC power output **6.** Rectifier efficiency	CO1	PO1	12
	b)		Design a Zener regulator for following specification: Load current I_L = 30mA output voltage V_0 = 6 V, Zener wattage Pz = 700mW, Input voltage Vi= 10±2V and I_{Zmin} = 6 mA	CO3	PO3	8
			UNIT - II			
3	a)		Briefly explain the any two advantages of negative feedback systems.	-	-	10
	b)		Deduce the relationship between various Transistor current and also α and β of a transistor. In a common emitter transistor circuit, if β = 80 and I_B = 40μA, compute the values of α, I_E and I_C.	CO1	PO1	10
			UNIT - III			
4	a)		Derive how Operational Amplifier can be used as a subtracting device.	CO1	PO1	8
	b)		What is the frequency of Hartley oscillator if the total inductance of L1 and L2 is 50mH and the capacitance of the resonant circuit is 200pF?	CO1	PO1	4
	c)		Design an Op-Amp circuit to provide an output of Vo= - [3V1+6V2+9V3].	CO3	PO3	8

			UNIT - IV			
	5	a)	Perform the following a) $(532.65)_{10} = (?)_{16} = (?)_{8}$ b) $(250.67)_{16} = (?)_{2} = (?)_{10}$	***CO1***	***PO1***	**10**
		b)	Analyze the logic circuit shown in fig. Determine the Boolean function for Q and state its truth table. 	***CO2***	***PO2***	**5**
		c)	Design Full Adder circuit using 2 Half adders .	***CO3***	***PO3***	**5**
			OR			
	6	a)	Simplify and realize using logic gates (i)$f(A,B,C) = A\bar{B}\,C + \bar{C} + BCA + BC$ (ii) $f(A,B,C) = \overline{\overline{AB} + \bar{B} + \overline{CA}} + \bar{B}\bar{C}$	***CO1***	***PO1***	**10**
		b)	Analyze the below given logic circuit for an output Y when input C=1. Write expression at each stage 	***CO2***	***PO2***	**5**
		c)	A logic circuit has 3 inputs A, B, C and one output Y. Y=B XNOR C when A=0, and Y=B when A=1. Design the logic circuit with minimum number of gates and implement using logic gates.	***CO3***	***PO3***	**5**
			UNIT - V			
	7	a)	With a neat block diagram, explain the components of the basic communication System.	-	-	**10**
		b)	Compare 1G, 2G, 3G and 4G technologies of cellular communication.	-	-	**10**

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