

U.S.N.

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

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E.

Branch: Common to all Branches

Course Code: 22EC1ESBEC / 22EC2ESBEC

Course: Basic Electronics

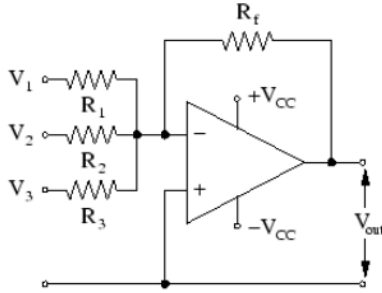
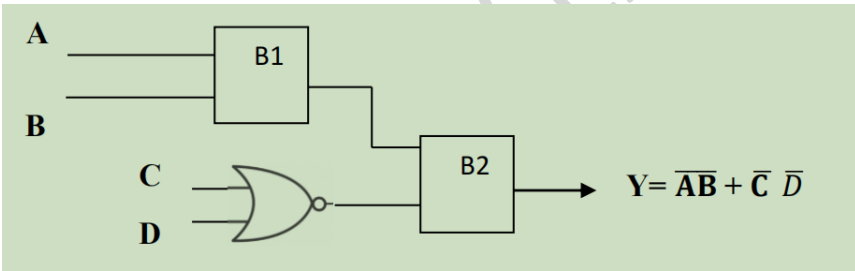
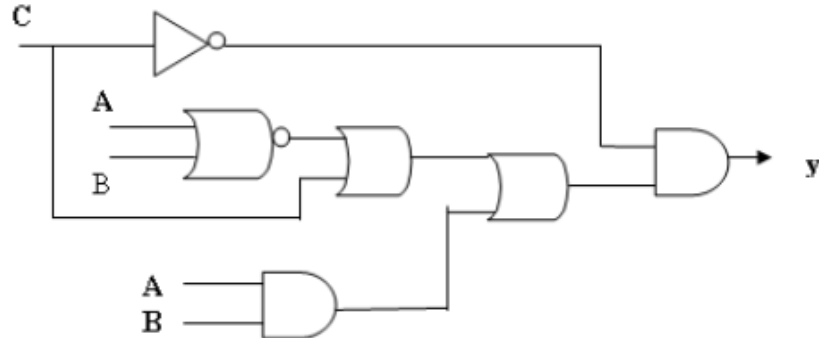
Semester: I / II

Duration: 3 hrs.

Max Marks: 100

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)	Explain the working of Full - Wave Bridge Rectifier with capacitor filter.	-	-	06
		b)	Explain the working of Zener Shunt regulator along with neat circuit diagram and expressions	-	-	08
		c)	A Halfwave rectifier with $R_L=1k\Omega$ is given an input of 10V peak from the stepdown transformer. Calculate DC voltage and load current for ideal and silicon diode.	CO1	PO1	06
			OR			
	2	a)	Derive the expression for Ripple factor and efficiency of Half-wave rectifier	CO1	PO1	08
		b)	Explain the Avalanche and Zener breakdown.	-	-	06
		c)	Design a Zener regulator for following specification: Load current $I_L = 40mA$ output voltage $V_0 = 6.1 V$, Maximum Zener wattage $P_z = 500mW$, Input voltage $V_i = 14\pm 2V$ and $I_{Zmin} = 6 mA$	CO3	PO3	06
			UNIT - II			
	3	a)	With a neat diagram, explain the input and output characteristics of a transistor in common emitter configuration.	-	-	08
		b)	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	06
		c)	Define feedback system, and mention its type. Derive the expression for gain with positive feedback.	CO1	PO1	06
			UNIT - III			
	4	a)	Explain the block of operational amplifier with a neat diagram.	-	-	05
		b)	How sustained oscillations are produced in crystal oscillator and explain its operation with a diagram.	-	-	08

	c)	<p>The summing amplifier as shown in below figure has $R_f = 10K\Omega$, $R_1 = 10K\Omega$, $R_2 = 2.2K\Omega$ and $R_3 = 3.3K\Omega$, If $V_1 = 6V$, $V_2 = -3V$, $V_3 = -0.75V$, Find V_o</p> 	CO1	PO1	07
		UNIT - IV			
5	a)	With the state table, explain the working of SR Flip-flop realized using NAND gates.	-	-	07
	b)	<p>Simplify the following Boolean expression using Boolean Laws and Realize using logic gates and only NAND gates.</p> $f(A, B, C) = AB + \bar{A}BC + A\bar{C} + \bar{A}\bar{B}C$	CO 1	PO 1	08
	c)	<p>Analyze the given circuit to identify the logic used in the blocks B1 and B2 to obtain output Y.</p> 	CO 2	PO 2	05
		OR			
6	a)	Write the truth table of a full adder. Implement the same using basic logic gates.	CO1	PO1	08
	b)	<p>Perform the following</p> <p>i) $(2AB.8)_{16} = (?)_{10} = (?)_8$</p> <p>ii) $(526.44)_8 = (?)_2 = (?)_{10}$</p>	CO1	PO1	06
	c)	<p>Analyze the below given logic circuit for an output Y when input C=0. Write expression at each stage</p> 	CO2	PO2	06

			UNIT-V			
	7	a)	With a neat block diagram explain the components of the basic communication System.	-	-	06
		b)	Explain the different types of modulation techniques with relevant Waveforms. Mention the modulation index of AM and FM wave.	-	-	08
		c)	A 15KHz audio signal is used to frequency modulate a 100MHz carrier, causing a carrier deviation of 75KHz. Determine Modulation Index and Carrier swing?	<i>CO1</i>	<i>PO1</i>	06

SUPPLEMENTARY EXAMS 2023