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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.

UNIT - I			<i>CO</i>	<i>PO</i>	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.	<i>CO1</i>	<i>PO1</i>	06
OR					
2	a)	Derive the expression for Ripple factor and efficiency of Half-wave rectifier	<i>CO1</i>	<i>PO1</i>	08
	b)	Explain the Avalanche and Zener breakdown.	-	-	06
	c)	Design a Zener regulator for following specification: Load current $I_L = 40\text{mA}$ output voltage $V_0 = 6.1\text{ V}$, Maximum Zener wattage $P_z = 500\text{mW}$, Input voltage $V_i = 14\pm2\text{V}$ and $I_{Z\min} = 6\text{ mA}$	<i>CO3</i>	<i>PO3</i>	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 $I_B = 50\mu\text{A}$, compute the values of α , I_E and I_C	<i>CO1</i>	<i>PO1</i>	06
	c)	Define feedback system, and mention its type. Derive the expression for gain with positive feedback.	<i>CO1</i>	<i>PO1</i>	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

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.

	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_{out}</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)	Simplify the following Boolean expression using Boolean Laws and Realize using logic gates and only NAND gates.	CO 1	PO 1	08
		$f(A, B, C) = AB + \bar{A}BC + A\bar{C} + \bar{A}\bar{B}C$			
	c)	Analyze the given circuit to identify the logic used in the blocks B1 and B2 to obtain output Y.	CO 2	PO 2	05
		$Y = \overline{AB} + \overline{C} \overline{D}$			
		OR			
6	a)	Write the truth table of a full adder. Implement the same using basic logic gates.	CO1	PO1	08
	b)	Perform the following i) $(2AB.8)_{16} = (?)_{10} = (?)_8$ ii) $(526.44)_8 = (?)_2 = (?)_{10}$	CO1	PO1	06
	c)	Analyze the below given logic circuit for an output Y when input C=0. Write expression at each stage	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>COI</i>	<i>POI</i>	06

SUPPLEMENTARY EXAMS 2023