U.S.N.										

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

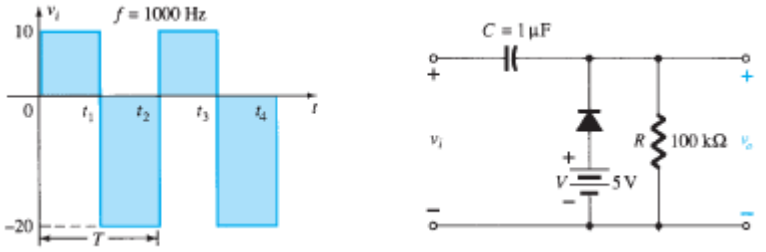
Autonomous Institute Affiliated to VTU

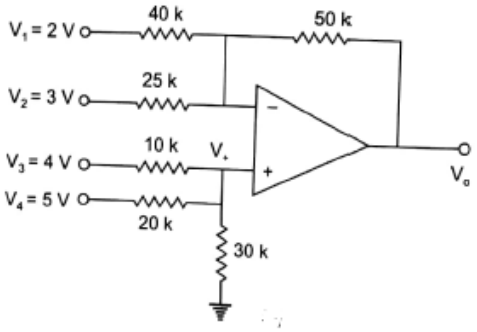
April 2024 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Electronics and Communication Engineering **Duration: 3 hrs.**
Course Code: 22EC3PCAEC **Max Marks: 100**
Course: Analog Electronic Circuits

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)	Analyze the given circuit in Fig 1, determine the output voltage and plot the output waveform for the circuit given below: i) Using ideal diode ii) Using Si diode  Fig-1	CO3	PO 2	10
	b)	Deduce the small signal r_e equivalent model for the voltage divider configuration circuit. Also obtain the expressions for Av. z_i and z_o	CO 2	PO 1	10
		UNIT - II			
2	a)	Derive expressions for gain, input resistance and output resistance of voltage shunt feedback with block representation approach.	CO 2	PO 1	10
	b)	What is the drawback of the Class B Power Amplifier? Explain the measures to overcome the same with suitable diagrams	CO 1	-	5
	c)	Suggest a suitable method to increase the efficiency of series fed Class A Power Amplifier and deduce an expression to prove the efficiency is higher than Series fed Class A type.	CO 2	PO 1	5
		UNIT - III			
3	a)	An enhancement type NMOS transistor with Vt=0.7V conducts a current ID=100μA when $V_{GS}=V_{DS}$=1.2V.Find the value of ID for V_{GS}=1.5V and V_{DS}=3V. Also calculate the value of the drain to source resistance R_{DS} for small V_{DS} and V_{GS}=3.2V.	CO 2	PO 1	10
	b)	Derive an expression for drain current of NMOS transistor that operates in i) Triode region ii) Saturation region	CO 2	PO 1	10

			OR			
	4	a)	Determine and comment on the drain currents for a n-channel MOSFET with t_{ox} = 20 nm, μ_n = 650 cm2/V.s, Vt = 0.8 V, and W/L = 10. (a) V_{GS} = 5 V and V_{DS} = 1 V. (b) V_{GS} = 2 V and V_{DS} = 1.2 V. (c) V_{GS}= 5 V and V_{DS} = 0.2 V. (d) V_{GS} = V_{DS} = 5 V	***CO 2***	***PO 1***	**10**
		b)	With the help of a graphical construction, obtain the transfer characteristics and deduce the condition for operation in the saturation region of a CS amplifier.	***CO 2***	***PO 1***	**10**
			UNIT - IV			
	5	a)	Develop a T equivalent model of a MOSFET with necessary equations and diagrams	***CO 2***	***PO 1***	**10**
		b)	Analyze the three different relationships for determining transconductance g_m.	***CO 3***	***PO 2***	**10**
			UNIT - V			
	6	a)	Deduce an expression for gain of a non-inverting amplifier. Denote the condition and describe the condition for a voltage follower	***CO 2***	***PO 1***	**10**
		b)	For a certain application it is required to convert a voltage signal to proportional output current. Identify the circuit which performs the function and describe the different types.	***CO 2***	***PO 1***	**10**
			OR			
	7	a)	Determine Vo for the adder subtractor circuit shown in Fig-2  Fig-2	***CO 2***	***PO 1***	**10**
		b)	Derive an expression for time period "T" for monostable multivibrator using 555.Describe the working with necessary timing diagram.	***CO 2***	***PO1***	**10**

****