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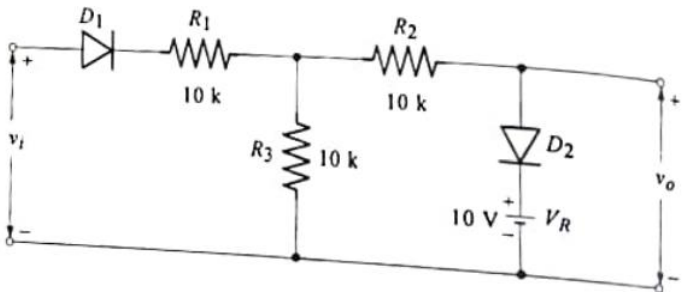
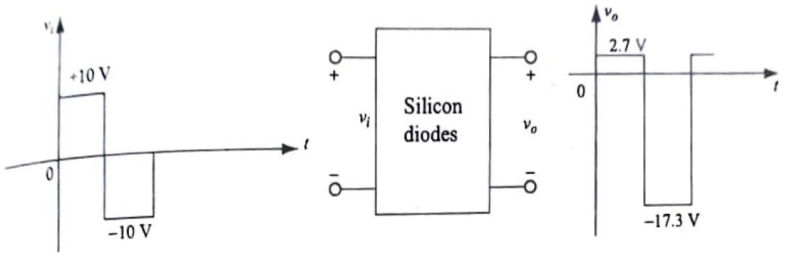
B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**
Course Code: 22EE4PCAEL **Max Marks: 100**
Course: Analog Electronic Circuits and LIC

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)	Explain the operation of double ended clipper circuit	CO2	PO1	**06**
	b)	Explain the operation of positive clamper circuit with relevant circuit and waveforms	CO2	PO1	**06**
	c)	Design a voltage divider bias circuit having silicon transistor with Vcc = 18V, Ic = 2.3mA, VCE = 8.2V, RC = 3.3K, β = 100 & S(ICO) = 5	CO2	PO3	**08**
		OR			
2	a)	Plot the transfer characteristics of the circuit shown in Fig 2a assuming ideal diodes and sketch the output voltage wave form if Vs=40sinωt  Fig 2a	CO2	PO3	**08**
	b)	For the output waveform shown in fig 2b draw the circuit schematic  Fig 2b	CO2	PO3	**06**

		c)	What is the advantage of voltage divider biasing? Justify answer by deriving the expressions for collector current, emitter current and stability factor	*CO1*	*PO2*	**06**
			UNIT - II			
	3	a)	Explain the various types of feedback amplifiers.	*CO2*	*PO2*	**08**
		b)	An amplifier is required to deliver 50W to a 16ohm loud speaker i) Calculate the input power required if the power gain is 20dB ii) Calculate the input voltage required if the amplifier voltage gain is 40dB	*CO3*	*PO2*	**06**
		c)	Explain the operation of a series fed class A amplifier. Obtain expressions for output power, efficiency, maximum efficiency.	*CO2*	*PO2*	**06**
			OR			
	4	a)	Draw the circuit diagram of a Darlington configuration of BJT amplifier circuit. Derive the expressions for the bias points	*CO2*	*PO2*	**10**
		b)	Determine the voltage gain, input, and output impedance with feedback for voltage-series feedback having A = -100, Ri = 10 kΩ, and Ro = 20 kΩ for feedback of (a) b β=0.1 and (b) b β=0.5.	*CO2*	*PO2*	**10**
			UNIT - III			
	5	a)	Draw the structure of MOSFET, and explain the working principle, sketch the output characteristics of MOSFET	*CO2*	*PO2*	**10**
		b)	A transformer coupled class A amplifier drives a load of 8 ohm through a 3:1 transformer. With Vcc=24V, the circuit delivers 2W to the load. The transformer efficiency is 80%. Find i) Power across the transformer primary ii) Conversion efficiency if dc collector current is 260mA	*CO3*	*PO3*	**06**
		c)	Show that class A power amplifier maximum efficiency is 25%	*CO2*	*PO2*	**04**
			OR			
	6	a)	Explain transformer coupled class-A amplifier.	*CO2*	*PO2*	**08**
		b)	Define drain resistance, transconductance and amplification factor of JFET.	*CO2*	*PO2*	**06**
		c)	With the help of a neat diagram explain the operation of *n*-channel enhancement type MOSFET.	*CO2*	*PO2*	**06**
			UNIT-IV			
	7	a)	Obtain the expressions for the voltage gain of inverting and non-inverting amplifier	*CO3*	*PO2*	**08**
		b)	Differentiate between adjustable and fixed voltage regulators	*CO3*	*PO2*	**06**
		c)	Design a low pass filter with fc=2kHz and a pass band gain of 4. Plot the frequency response and determine the value of quality factor Q.	*CO4*	*PO2*	**06**

			OR			
	8	a)	Design an opamp adder-subtractor circuit with the following output voltage expression $V_o=4(V_3+V_4)-2(V_1+V_2)$.	*CO3*	*PO2*	**08**
		b)	Explain the operation of instrumentation Amplifier.	*CO2*	*PO2*	**06**
		c)	Using LM 317 design an adjustable voltage regulator to satisfy the following specifications: output voltage Vo= 10 to 12V and output current Io=200mA, draw the complete circuit diagram and incorporate the component values	*CO4*	*PO3*	**06**
			UNIT - V			
	9	a)	In a symmetrical inverting Schmitt trigger, calculate the values of feedback network resistors if the saturation voltages are ±12*V* and the hysteresis width is 5*V*. Draw the circuit incorporating all the values	*CO3*	*PO3*	**08**
		b)	Explain the operation of saw-tooth generator	*CO3*	*PO2*	**06**
		c)	Explain the operation of voltage to current converter with load grounded.	*CO2*	*PO2*	**06**
			OR			
	10	a)	Explain with a neat circuit diagram & waveform the operation of inverting Schmitt trigger circuit. Design a Schmitt trigger for UTP=3.5V and LTP=2.0V. Vsat=10V.	*CO2*	*PO2*	**10**
		b)	With the help of a neat circuit diagram, explain the operation of the triangular generator op-amp application. Derive an equation for the frequency of oscillations.	*CO2*	*PO2*	**10**

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