U.S.N.										

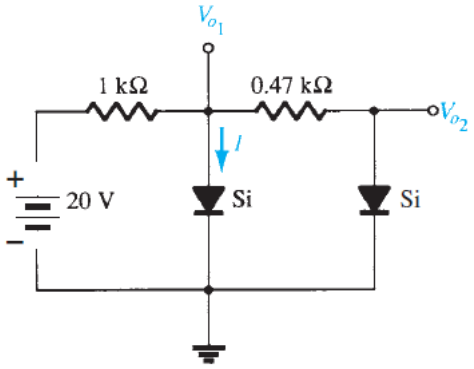
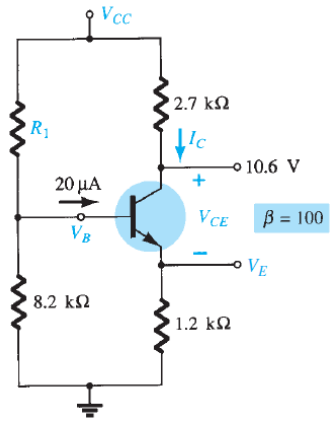
B.M.S. College of Engineering, Bengaluru-560019

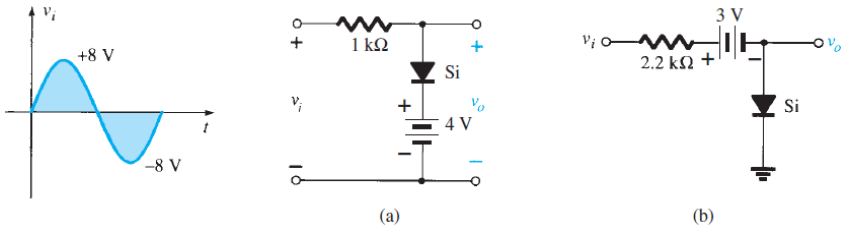
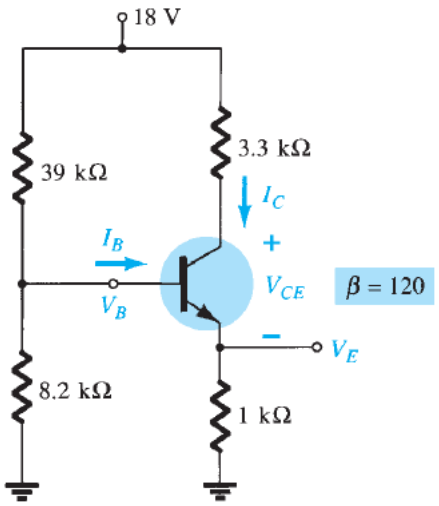
Autonomous Institute Affiliated to VTU

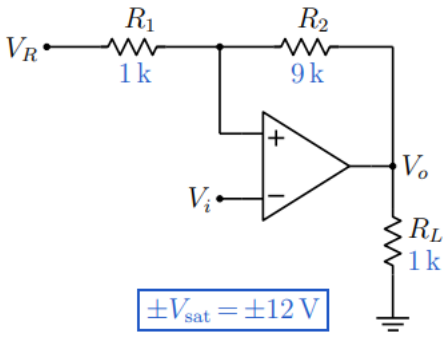
September / October 2023 Semester End Main Examinations

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)	What is meant by transistor biasing? Using exact analysis (Thevenin Theorem), obtain expressions for I_B, I_C, V_{CE} for a voltage divider bias circuit.	CO1	PO1	**08**
	b)	Determine V_{o1} , V_{o2} , and I for the network of Fig.1.b  Fig 1.b	CO2	PO1	**06**
	c)	Given the information appearing in Fig. 1.c , determine: a. I_C b. V_E c. V_{CC} d. V_{CE} e. V_B f. R_1  Fig 1.c	CO2	PO1	**06**
		OR			

	2	a)	What is bias stabilization? What are the factors affecting the stability of a transistor? Define stability factors and give expressions for stability factors for voltage divider bias.	*CO1*	*PO1*	**06**
		b)	Determine v_o for each network of Fig. 2.b for the input shown  Fig 2.b	*CO2*	*PO1*	**08**
		c)	Determine the following for the voltage-divider configuration of Fig 2.c using the approximate approach if the condition is satisfied. a. I_C b. V_{CE} c. I_B d. V_E e. V_B  Fig 2.c	*CO2*	*PO1*	**06**
			UNIT - II			
	3	a)	What is the main feature of a Darlington connected transistor amplifier circuit? Draw the circuit diagram of an Emitter-follower configuration with a Darlington amplifier. Calculate the bias voltages for the following specifications: V_{cc}=18V, R_B=3.3MΩ, R_E=390Ω, β_1=50, β_2=100.	*CO3*	*PO2*	**10**
		b)	Draw the four basic feedback network connections and mark all the significant parameters in it. Derive the expressions of gain, input impedance and output impedance of voltage series feedback amplifier.	*CO2*	*PO1*	**10**
			UNIT - III			
	4	a)	Explain the operating principle of series fed class A amplifier. Obtain the expressions for output power, efficiency and maximum efficiency.	*CO1*	*PO1*	**08**
		b)	For a class B amplifier providing a 20-V peak signal to a 16Ω load (speaker) and a power supply of V_{CC} = 30 V, determine the input power, output power, and circuit efficiency.	*CO2*	*PO1*	**04**

		c)	With neat structural diagram and waveforms, describe the working of n-channel enhancement type MOSFET. Draw output and transfer characteristics	*CO1*	*PO1*	**08**
			UNIT - IV			
	5	a)	With a neat circuit diagram, explain the operation of an instrumentation amplifier. List the important features and any two applications of instrumentation amplifier	*CO2*	*PO1*	**10**
		b)	With neat circuit diagram and waveforms, explain the operation of a second order low pass filter. Draw the frequency response. Derive an expression for the transfer function of the filter.	*CO2*	*PO1*	**10**
			OR			
	6	a)	With the help of a circuit diagram, show that an op-amp can be used as (i) inverting adder and (ii) non-inverting adder. Draw an op-amp circuit whose output is $V_4+V_3-V_1-V_2$	*CO3*	*PO2*	**10**
		b)	With neat circuit diagram and waveforms, explain the operation of a second order low pass filter. Draw the frequency response. Derive an expression for the transfer function of the filter.	*CO2*	*PO1*	**10**
			UNIT - V			
	7	a)	With circuit diagrams, explain the operation of a voltage to current converter if the load is (i) floating and (ii) grounded. Is there any limitation on the size of the load when grounded?	*CO2*	*PO1*	**10**
		b)	For the Schmitt trigger circuit shown in Fig. 7 b, plot V_o versus V_i for (a) $V_R = 0$ V, (b) $V_R = 5$ V.  Fig. 7.b	*CO4*	*PO2*	**10**

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