U.S.N.										

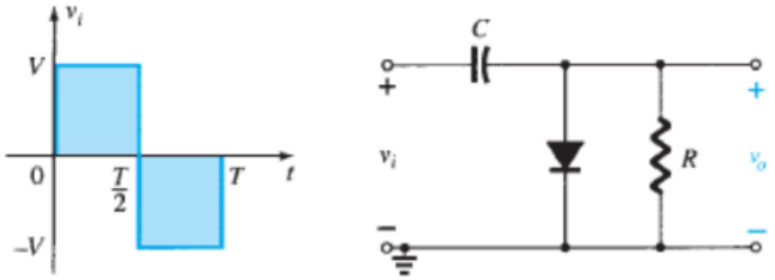
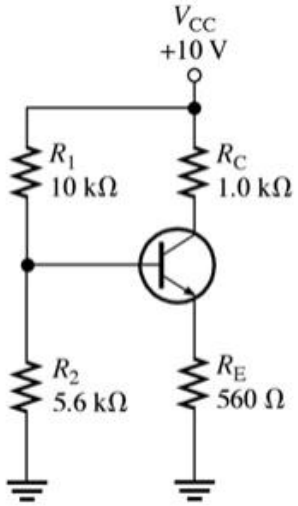
B.M.S. College of Engineering, Bengaluru-560019

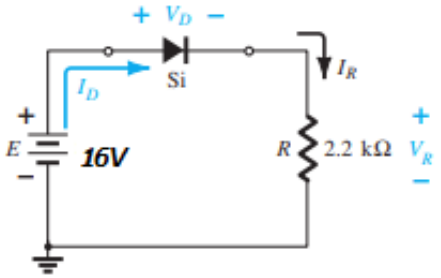
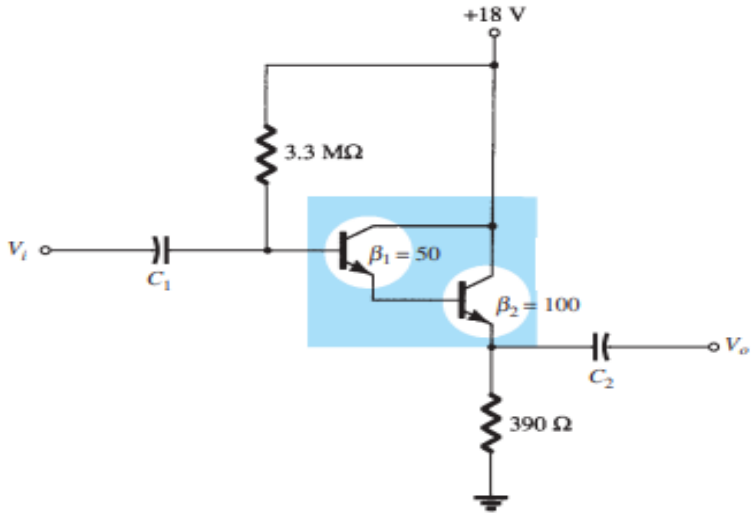
Autonomous Institute Affiliated to VTU

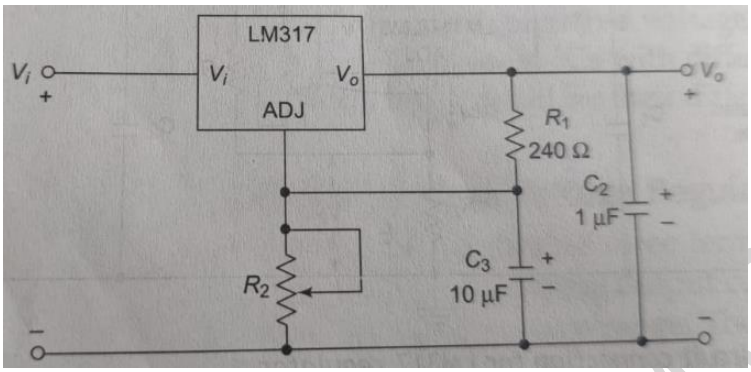
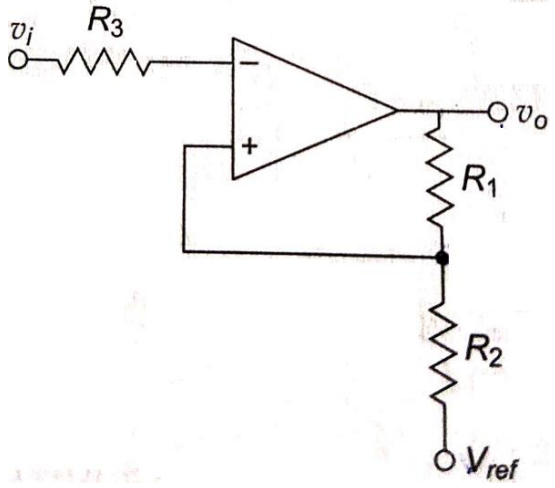
December 2023 Supplementary Examinations

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)		With a neat output device characteristic of BJT explain the importance of Q Point in biasing.	*CO1*	*PO1*	**05**
	b)		Determine the output voltage and input – output waveform of the circuit shown in Fig. 1b. Assuming ideal diodes, 1kΩ resistor and 1 Vp.  Fig.1b	*CO3*	*PO2*	**07**
	c)		Determine V_{CE} and I_C in the voltage-divider biased transistor circuit. Assume β_{DC} = 100 and $I_E \cong I_C$.  Fig.1c	*CO2*	*PO1*	**08**

			OR			
	2	a)	Derive expressions for Av, Ai, Zi and Zo for common emitter voltage divider bias configuration using complete r_e equivalent model	*CO2*	*PO1*	**08**
		b)	For the series-diode shown in Fig 1c. Determine V_D, V_R and I_D  Fig.2b	*CO2*	*PO1*	**06**
		c)	Using exact analysis (Thevenin Theorem), obtain expressions for I_B , V_{CE} for a voltage divider bias circuit.	*CO2*	*PO1*	**06**
			UNIT - II			
	3	a)	Draw the four basic feedback network connections and mark all the significant parameters in it.	*CO1*	*PO1*	**08**
		b)	Determine the dc bias voltages and currents for the Darlington configuration of Fig. 3b.  Fig.3b.	*CO3*	*PO2*	**07**
		c)	With a neat circuit diagram explain the operation of basic cascode connection.	*CO1*	*PO2*	**05**
			UNIT - III			
	4	a)	Describe the working and construction of N channel Enhancement type MOSFET	*CO1*	*PO2*	**08**
		b)	Determine the efficiency of a transformer-coupled class A amplifier for a supply of 12 V and outputs of: a) V(p) = 12 V. b) V(p) = 6 V.	*CO2*	*PO2*	**04**
		c)	With a relevant circuit explain DC bias and AC operation of a series fed Class A amplifier also arrive at the expression for maximum efficiency .	*CO2*	*PO2*	**08**

			UNIT - IV			
	5	a)	With neat circuit diagram and waveforms, explain the operation of a first order low pass filter. Draw the frequency response. Derive an expression for the transfer function of the filter.	*CO1*	*PO2*	**08**
		b)	Referring to the Fig.5b, design an adjustable positive voltage regulator using LM317 for an output voltage V_o varying from 4 to 12V and an output I_o of 1A.  Fig.5b	*CO3*	*PO3*	**07**
		c)	Describe the important features of Instrumentation amplifier	*CO1*	*PO1*	**05**
			OR			
	6	a)	With a neat circuit connection explain the operation of LM337 regulator.	*CO2*	*PO2*	**08**
		b)	Given a band pass filter with resonant frequency of f_r of 1000Hz and a bandwidth (B) of 3000Hz, Determine its a) quality factor b) lower cut-off frequency and c) higher cut-off frequency.	*CO2*	*PO2*	**07**
		c)	With neat block diagrams explain the types of linear voltage regulators.	*CO2*	*PO2*	**05**
			UNIT - V			
	7	a)	For the Schmitt trigger circuit shown in Fig.7a. R1= 56kΩ, R2= 150Ω, V_i =1 V_{pp} sine wave of frequency 50Hz, V_{ref} =0V and op amp 741 is used with supply voltages of = ± 15V and the saturation voltages are ±13V. Determine the threshold voltages V_{UT} and V_{LT} and draw the input and output waveforms. Also, plot the hysteresis voltage curve.  Fig.7a.	*CO2*	*PO2*	**06**

		b)	With a neat circuit diagram enumerate the operation of voltage to current converter with grounded load.	*CO2*	*PO2*	**07**
		c)	With a neat circuit diagram explain triangular wave generator	*CO2*	*PO2*	**07**

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