U.S.N.										

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

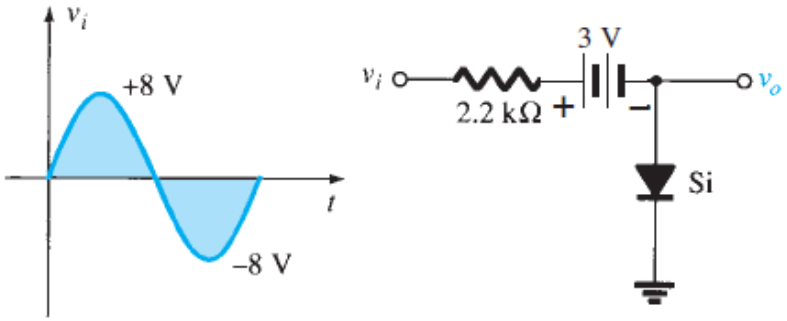
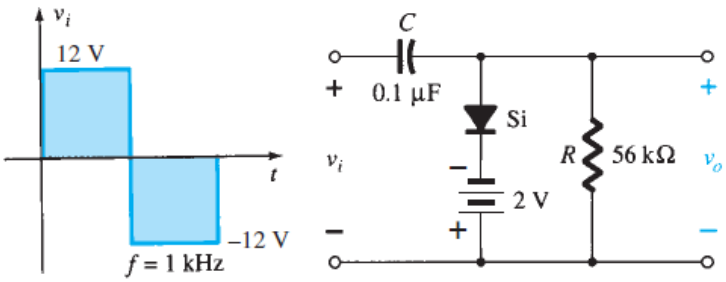
Autonomous Institute Affiliated to VTU

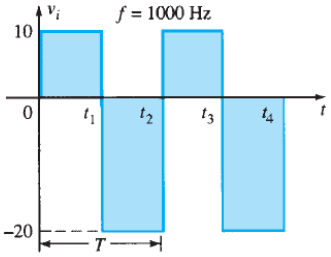
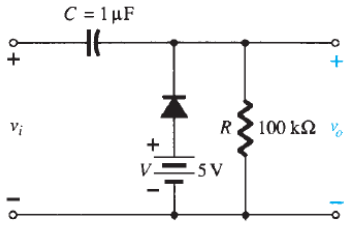
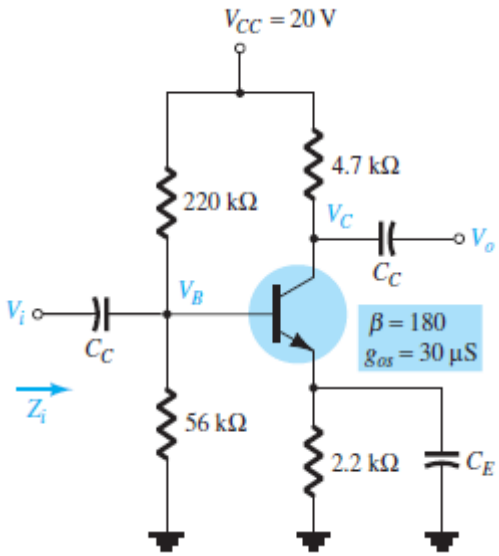
April 2024 Semester End Main Examinations

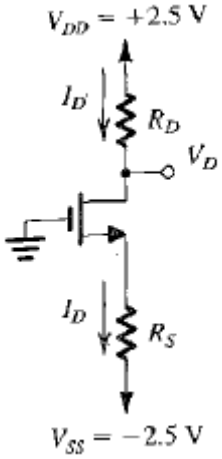
Programme: B.E. **Semester: III**
Branch: MD/EIE **Duration: 3 hrs.**
Course Code: 23ES3PCAME **Max Marks: 100**
Course: Analog Microelectronics

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)		Determine Vo for the circuit shown in figure 1.a  Fig 1.a	CO1	PO1	**06**
	b)		Sketch Vo for the circuit shown in fig 1.b  1.b	CO1	PO1	**06**
	c)		Derive an expression for Zi, Zo, Av for the voltage divider network without bypass capacitor.	CO1	PO1	**08**
			OR			
2	a)		Briefly narrate the process of fixing the operating point using voltage divider bias network.	CO1	PO1	**06**
	b)		For the circuit shown in figure draw the output waveform	CO1	PO1	**06**

			 			
	c)	Determine re, Vb, Ve, Zi, Av for the circuit shown in figure 2.c  Fig 2.c	*CO1*	*PO1*	**08**
		UNIT - II			
3	a)	Explain with the help of mathematical expressions, how the negative feedback in amplifiers increases amplifier bandwidth and reduces distortion in amplifiers.	*CO2*	*PO2*	**06**
	b)	An amplifier with gain of -1000 and feedback of β=-0.1 has 20% change in gain, calculate the change in gain of the feedback amplifier.	*CO2*	*PO2*	**06**
	c)	For the voltage series feedback amplifier topology, obtain expression for AV and Rif.	*CO2*	*PO2*	**08**
		UNIT - III			
4	a)	Derive the equation for maximum efficiency of a series fed class A power amplifier and explain its operation.	*CO3*	*PO3*	**08**
	b)	For a class B amplifier providing a 20-V peak signal to a 16Ω load (Speaker) and a power supply of *VCC* = 30 V, determine the input power, output power, and circuit efficiency.	*CO3*	*PO3*	**04**
	c)	Explain the operation of a transformer coupled push pull power amplifier.	*CO3*	*PO3*	**08**
		UNIT - IV			
5	a)	Explain the operation of Enhancement MOSFET as VDS is increased.	*CO2*	*PO2*	**07**

		b)	Design the circuit of Fig.5.b so that the transistor operates at *ID* = 0.4 mA and *VD* = +0.5 V. The NMOS transistor has *Vt,* = 0.7 V, $\mu_n C_{ox}$ = 100 μA/V^2, L = 1 μm, and *W* = 32 μm. Neglect the channel-length modulation effect (i.e., assume that *X* = 0).  Fig 5.b	*CO2*	*PO2*	**06**
		c)	Explain the biasing of MOSFET using current source.	*CO2*	*PO2*	**07**
			UNIT – V			
	6	a)	Using the small signal circuit model obtain the expression for gm of a MOSFET.	*CO3*	*PO3*	**10**
		b)	Deduce the voltage gain of a CS amplifier with source resistance.	*CO3*	*PO3*	**10**
			OR			
	7	a)	Estimate the high frequency response of a CS amplifier.	*CO3*	*PO3*	**10**
		b)	Using the small signal equivalent circuit model obtain the voltage gain of a source follower.	*CO3*	*PO3*	**10**

****