CourseCode-21EE32

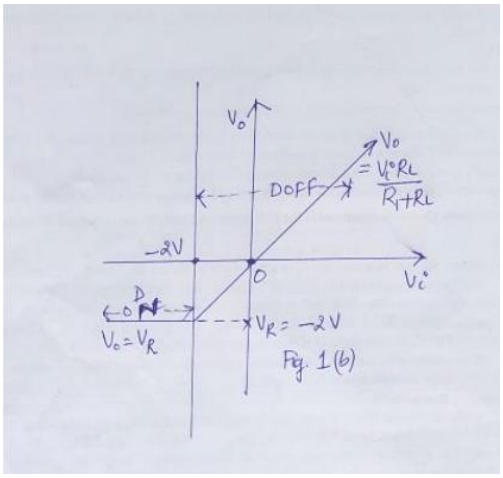
Model Question Paper (CBCS Scheme)

USN										

Third Semester BE Degree Examination
Course Title– Analog Electronic Circuits and Op amps

TIME: 03 Hours **Max.Marks:100**

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Q.No.		Module1	Marks
Q1	a	Explain the static resistance and dynamic resistance of a diode.	06
	b	Design a shunt clipping circuit for the transfer characteristic as shown in Fig.1 (b). Assume that a resistance of $1K\Omega$ is connected in series with input sinusoidal signal and output is taken across $RL = 10K\Omega$. Draw the input and output voltage waveforms.  Fig. 1(b)	07
	c	Define stability factor and derive an expression for stability factor S in a voltage divider bias circuit.	08
OR			
Q2	a	For the transistor amplifier in general form obtain expressions for current gain, input resistance, voltage gain and output resistance using h-parameter model	10
	b	Draw and explain the negative clamper circuit. Sketch the input and voltage waveforms.	05
	c	For the emitter follower configuration, derive expressions for current gain and input resistance using simplified hybrid model.	05
Module 2			
Q3	a	For the Darlington connection , explain the analysis of second and first stage in terms of current gain and input resistance . Use h-parameter model.	12
	b	Explain the concept of feedback with suitable block diagrams.	08
OR			

Q4	a	What is cascode connection? Draw the circuit of cascode amplifier and its simplified hparameter model.	08
	b	For the current series feedback topology, derive expressions for R_{if} and R_{of} '.	12
Module 3			
Q5	a	Explain the classification of amplifiers.	05
	b	For the series fed directly coupled Class A power amplifier, explain DC and AC analysis. Obtain expressions for power output, conversion efficiency and maximum conversion efficiency.	10
	c	Compare BJT and FET on different parameters.	05
OR			
Q6	a	For the push-pull Class-B amplifier, show that the efficiency at maximum power dissipation is only 50%.	05
	b	Explain construction, working and operating characteristics of n-channel JFET.	10
	c	A sinusoidal signal given by Vi = 10 sin 500t + 2 sin 1000t + 3 sin 1500 . Determine the percentage increase in the power due to distortion.	05
Module 4			
Q7	a	Draw and explain the working of AC amplifier in inverting and non- inverting mode. Also obtain an expression for voltage gain and lower cut off frequency fL for inverting ac amplifier.	10
	b	Design an averaging amplifier in inverting mode. Assume the input voltages are V_a = 1V, V_b = 2V, V_c = 3V. Draw the circuit diagram.	06
	c	Compare series and shunt voltage regulators.	04
OR			
Q8	a	Design a first order high pass filter for f_L = 5KHz, $pass\ band\ gain$ = 4. Assume C = 0.01 μF. Draw the circuit diagram and its frequency response.	08
	b	Draw and describe the working of voltage follower regulator using opamp.	08
	c	What is an instrumentation amplifier? State its applications.	04
Module 5			
Q9	a	Draw and explain the working of integrator using opamp, Obtain expressions for the cut off frequencies f_a and f_b.	10
	b	What is a comparator? Draw and explain the working of comparator in non-inverting mode. Draw the different waveforms when the reference voltage V_R is positive and negative.	10
OR			
Q10	a	Explain the working of triangular wave generator circuit using Schmitt trigger and integrator method. Derive expressions for amplitude of output voltage and frequency of triangular wave.	10
	b	What is zero crossing detector? State its drawback.	05
	c	Explain the working of voltage to current converter with grounded load.	05