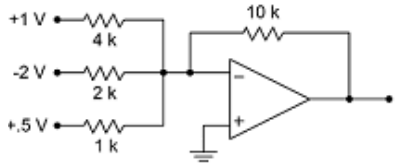
Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN **18EE46** | | | | | | | | | |

Fourth Semester(CBCS)B.E.DegreeExamination
OPERATIONAL AMPLIFIERS AND LINEAR ICs

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

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module 1	Bloom's Taxonomy Level	Marks
Q. 01	a	Explain the general stages of op-amps with a neat block diagram	L2	(08)
	b	Define and Explain the following terms :1) Input bias current 2) Input offset current 3)CMRR	L1	(06)
	C	Determine the output of the summing amplifier in Figure (1), with the given DC input voltages? 	L3	(06)
		OR		
Q. 02	a	Explain the operation of inverting A.C amplifier with neat circuit diagram	L2	(07)
	b	What is instrumentation amplifier? Discuss the operation of the circuit, and shown how the voltage gain can be varied.	L2	(07)
	c	Explain the working of inverting and non-inverting amplifier using op-amp	L2	(06)
		Module 2		
Q. 03	a	Derive the gain for second order high pass Butterworth filter	L3	(07)
	b	Explain in details about the all pass filter	L2	(06)
	c	Design a Butterworth second order high pass filter circuit to have a cut-off Frequency of 6KHZ calculate the actual cut-off frequency for the circuit using the selected component values	L3	(07)
		OR		
Q. 04	a	Explain the following working parameters of voltage regulator with a neat diagram 1)Regulator action 2) source effect 3)load effect 4) Ripple rejection	L2	(08)
	b	Explain the working and design of op-amp voltage follower regulator	L2	(06)
	c	Design an adjustable positive voltage regulator using LM317 for output voltage varying from 4 to 12V and output current of 1A	L3	(06)

		Module 3	Bloom's Taxonomy Level	Marks
Q. 05	a	Draw and explain triangular wave generator using square wave generator and integrator and draw the required waveforms.	L2	(08)
	b	Explain the working of voltage to current converter with grounded load.	L2	(06)
	C	Define a RC phase shift oscillator using op-amp .Assume c =0.1μF frequency of oscillation = 200Hz.	L3	(06)
		OR		
Q. 06	a	Explain the circuit of non-inverting comparator.Draw the different waveforms when V_{REF} is positive and negative	L2	(08)
	b	Explain the working of Schmitt trigger in inverting mode. Draw its hysteresis curve.	L2	(06)
	c	Design a non inverting Schmitt trigger circuit to have UTP = +3V and LTP=-5V use 741 op-amp with V_{CC}= ±15V.	L3	(06)
		Module 4		
Q.07	a	Explain the working of precision full wave rectifier with necessary circuit diagram and write difference between ordinary rectifier and precision rectifier.	L2	(08)
	b	Explain the working of linear Ramp ADC with necessary input and output waveform.	L2	(06)
	c	Explain the working of R-2R ladder DAC Assume the binary input is 001.	L2	(06)
		OR		
Q.08	a	Explain the working of integrated circuit 8 bit DAC.	L2	(07)
	b	Explain the working of successive approximation ADC.	L2	(07)
	c	Design a saturating precision half wave rectifier to produce a 5V peak output from an input with a1V peak-to-peak amplitude.	L3	(06)
		Module 5		
Q.09	a	Explain the operating principle of PLL. Hence define lock range,pull-in time, capture range.	L2	(08)
	b	Explain the function of various pins of 555 timer	L2	(06)
	c	Discuss how VCO integrates the PLL error voltage waveform and effect of integration.	L3	(06)
		OR		
Q.10	a	Explain how XOR gate can be used as phase detector in PLL	L2	(06)
	b	Explain working of monostable multivibrator using 555 timer and draw its input and output waveforms.	L2	(08)
	c	Explain PLL IC565 application as frequency multiplier and frequency synthesizer.	L2	(06)