SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Regular & Supplementary Examinations December-2023
ANALOG ELECTRONIC CIRCUITS
(Electical and Electronics Engineering)

Time: 3 Hours   **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	List the characteristics of negative feedback amplifiers.	**CO1**	**L1**	**6M**
	b	A voltage series negative feedback amplifier has a voltage gain without feedback of A=500, input resistance R_i=3 kΩ, output resistance R_o=20 kΩ and feedback ratio β=0.01.Calculate the voltage gain A_f, input resistance and output resistance of the amplifier with feedback.	**CO3**	**L3**	**6M**

OR

2	**a**	An amplifier has open loop gain 2000 and feedback ratio of 0.04, if the open loop gain changes by 10% due to temperature, find the percentage change in the gain of the amplifier feedback.	**CO3**	**L3**	**6M**
	b	Show that how a negative feedback reduces gain of an amplifier.	**CO1**	**L1**	**6M**

UNIT-II

3	**a**	Explain Barkhausen criterion for oscillations with suitable diagram.	**CO1**	**L2**	**6M**
	b	In the Hartley oscillator L2=0.4mH and C=0.004μF. If the frequency of the oscillator is 120kHz, find the value of L1. Neglect mutual inductance. Also calculate the frequeny of oscillation if L2 changs to 0.04 mH.	**CO4**	**L3**	**6M**

OR

4	**a**	In the Colpitts oscillator, C1=0.2μF and C2 = 0.02μF. If the frequency of oscillator is 10kHz, find the value of inductor. Also calculate the frequeny of oscillation if C2 changs to 2 μF.	**CO4**	**L3**	**6M**
	b	Explain the concept of stability in oscillators in detail.	**CO6**	**L2**	**6M**

UNIT-III

5	**a**	What are the four different configuration of differential amplifier?	**CO1**	**L1**	**6M**
	b	For an Non-inverting amplifier, R1= 5kohm, Rf =10 kΩ with input voltage Vi = 0.5V and a load resistance of R_L= 10 kΩ is connected to the output terminal. Calculate i)Vo ii)ACL iii) iL and iv) load current io indicating proper direction of flow.	**CO4**	**L3**	**6M**

OR

6	**a**	What is voltage follower? What are its features and applications?	**CO1**	**L1**	**6M**
	b	Explain AC characteristics of op-amp.	**CO5**	**L2**	**6M**

UNIT-IV

7	**a**	The op-amp non-inverting summing circuit has the following parameters VCC = +15 V, VEE = -15V, R = R1= 1 kΩ, Rf = 2 kΩ, V1 = +2 V, V2 = - 3 V, V3 = +4 V. Determine the output voltage Vo.	**CO3**	**L3**	**6M**
	b	Draw a neat circuit of astable multivibrator using op-amp and explain operation with waveforms.	**CO2**	**L2**	**6M**

8	a	Draw the input-output waveforms and frequency response of integrator.	CO1	L1	6M
	b	Define the duty cycle .Identify the percentage of duty cycle if Ton = 0.6 msec ,Toff = 0.4 msec.	CO4	L3	6M

$$\boxed{\text{UNIT-V}}$$

9	a	Draw the frequency response of filters.	CO1	L3	6M
	b	The basic step of a 9 bit DAC is 10.3 mV. If "000000000" represents 0 V. What output is produced if the input is "101101111"?	CO4	L3	6M

OR

10	a	Explain the first order low pass butter worth filter with a neat circuit diagram.	CO2	L2	6M
	b	Summarize the truth table for a flash type op-amp ADC using 8 by 3 priority encoder.	CO4	L2	6M

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