Q.P.Code: 18EC0407 | R18 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations May/June-2024
ANALOG CIRCUITS
(Electronics and Communication Engineering)

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

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1	a	What is cutoff frequency, f_β and write down its expression.	CO1	L2	2M
	b	Compare the performance of various feedback amplifiers.	CO2	L2	2M
	c	What are the differences between Push Pull and Complementary symmetry class B power amplifier?	CO3	L1	2M
	d	List the characteristics of an ideal opamp.	CO4	L1	2M
	e	Mention the types of DACs.	CO5	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2		With the help of necessary circuit diagrams and approximations obtain the expression for CE short circuit current gain and derive the relation between f_β and f_T.	CO1	L2	10M

OR

3	a	Explain the effect of cascading on bandwidth of multistage amplifier.	CO1	L2	6M
	b	If the overall lower and higher cutoff frequencies of a two identical amplifier cascade are 600 Hz and 18 kHz respectively, compute the values of individual cutoff frequencies of both the amplifier stages.	CO1	L3	4M

UNIT-II

4		Describe the working principle of Wein bridge oscillator and derive the expression for frequency of oscillations.	CO2	L2	10M

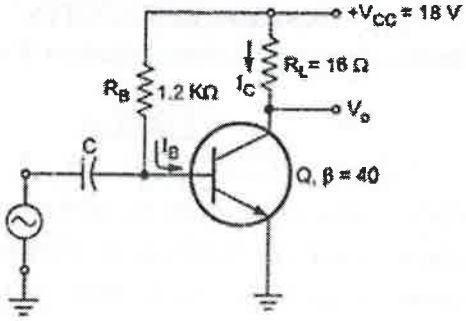
OR

5	a	Describe the working principle of Colpitts oscillator and derive the expression for frequency of oscillations.	CO2	L2	8M
	b	In the Colpitts oscillator, $C_1 = 0.2\mu F$ and $C_2 = 0.02\ \mu F$. If the frequency of oscillation is 10kHz, find the value of inductor.	CO2	L3	2M

UNIT-III

6	a	With neat diagram explain Series fed, Directly coupled Class A Power Amplifier and derive its maximum efficiency.	CO3	L2	5M

	b	A series fed Class A amplifier shown if the Fig, operates from dc source and applied sinusoidal input signal generates peak base current 9mA. Calculate : (i) Quiescent currentI_{CQ}, (ii) Quiescent voltage V_{CEQ}, (iii) DC	**CO3**	**L2**	**5M**



input power P_{DC}, (iv) AC output power P_{AC} and (v) Efficiency.

OR

7	**a**	Discuss with diagram, Transformer coupled Class A Power Amplifier and derive its Maximum efficiency.	**CO3**	**L1**	**5M**
	b	A Class B push pull amplifier drives a load of 16Ω, connected to the secondary of ideal transformer. The V_{cc} is 25V. If number of turns on primary is 200 and secondary is 50. Calculate maximum power output, DC power input and efficiency.	**CO3**	**L3**	**5M**

UNIT-IV

8	**a**	Draw a non inverting amplifier using an opamp and derive the expression for its closed loop voltage gain.	**CO4**	**L2**	**5M**
	b	Draw the circuit diagram of a Differential Amplifier and derive the expression for its output voltage. Write about difference and common mode gains.	**CO4**	**L2**	**5M**

OR

9		Explain the Schmitt Trigger with neat circuit diagram, input and output waveforms.	**CO4**	**L2**	**10M**

UNIT-V

10	**a**	Draw a First order low pass active filter and derive the transfer function its frequency response.	**CO5**	**L2**	**5M**
	b	Design a second order Butterworth low pass filter having upper cutoff frequency of 1KHz.	**CO5**	**L3**	**5M**

OR

11		Draw the circuit diagram of inverted R-2R ladder DAC network. Explain its working. List out the advantages over R-2R ladder network.	**CO5**	**L2**	**10M**

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