O.P.Code: 23EC0408	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Regular & Supplementary Examinations March/April-2026
ELECTRONIC CIRCUITS ANALYSIS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	What is the need for multistage amplifiers?	CO1	L1	2M
	b	Draw the h-parameter model of a transistor.	CO1	L1	2M
	c	List the internal capacitances of MOS differential amplifier.	CO1	L4	2M
	d	Define gain of an amplifier and express it in dB.	CO1	L1	2M
	e	List the four basic feedback topologies.	CO1	L2	2M
	f	Define oscillator and list the types of oscillators.	CO1	L1	2M
	g	Define Power amplifier. List the different types of power amplifiers.	CO3	L1	2M
	h	Give the expression for total harmonic distortion (THD) in an amplifier.	CO3	L1	2M
	i	Define tuned amplifier and list the applications of tuned amplifiers.	CO2	L1	2M
	j	Differentiate between astable and Monostable multivibrators.	CO3	L2	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Define distortion. Explain the cause and effects of amplitude, frequency and phase distortion in an amplifier.	CO1	L2	5M
	b	Classify the amplifiers.	CO1	L4	5M

OR

3		With suitable circuit diagrams, derive the expression for differential voltage gain of a MOS differential amplifier using small signal operation.	CO2	L3	10M

UNIT-II

4	a	Draw the high frequency model of MOSFET.	CO2	L2	5M
	b	With relevant circuit diagrams, explain the internal capacitive effects of MOSFET.	CO2	L2	5M

OR

5	a	Derive the relation between fT and fβ for a BJT CE amplifier operating at high frequency.	CO2	L4	5M
	b	Short circuit CE current gain of a transistor is 20 at a frequency of 1MHz. If fβ = 200KHz, Calculate (i) fT (ii) hfe (iii) Find |Ai| at frequency of 10MHz	CO2	L4	5M

UNIT-III

6	a	Explain the four feedback amplifier topologies in detail with neat block diagrams.	CO3	L5	6M
	b	Explain types of samplers and mixers used in negative feedback amplifiers.	CO3	L2	4M

OR

7	a	Determine the frequency of oscillations when a RC phase shift oscillator has R=10kΩ, C=0.01μF and RC = 2.2 KΩ. Also find the minimum current gain needed for this purpose.	CO4	L3	5M
	b	In a Wein-bridge oscillator, if the value of R is 100 KΩ, and frequency of oscillation is 10 KHz, Calculate the value of capacitor C.	CO4	L4	5M

UNIT-IV

8	a	With neat diagrams, explain Series fed directly coupled Class A Power amplifier.	CO3	L2	5M
	b	Derive the maximum efficiency expression for Series fed directly coupled Class A Power Amplifier.	CO3	L3	5M

OR

9	a	Compare class A, class B, Class AB and Class C power amplifiers.	CO3	L4	5M
	b	Describe the structure of Power MOSFET.	CO3	L2	5M

UNIT-V

10	a	Explain the operation of Schmitt trigger.	CO3	L5	5M
	b	Determine the value of capacitors to be used in an Astable multivibrator to provide a train pulse 2μs wide at a repetition rate of 100 KHz, if R1 =R2 =20kΩ.	CO5	L2	5M

OR

11	a	Explain the operation of a single tuned capacitive coupled amplifier with a neat circuit diagram.	CO2	L2	5M
	b	Compare different types of tuned amplifiers.	CO1	L4	5M

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