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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester Supplementary Examinations December-2025
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	A three-stage amplifier has gain of 10 dB,20 dB and 30 dB respectively. Calculate overall gain of the amplifier	CO2	L3	2M
	b	Define bandwidth of an amplifier and give its unit.	CO1	L1	2M
	c	List the internal capacitances of MOS differential amplifier.	CO1	L1	2M
	d	What is gain bandwidth product?	CO1	L1	2M
	e	What is meant by feedback? Classify the types of feedback.	CO1	L1	2M
	f	Define oscillator and list the types of oscillators.	CO1	L1	2M
	g	State total harmonic distortion (THD) in an amplifier mathematically.	CO3	L1	2M
	h	List the key characteristics of power BJTs.	CO3	L1	2M
	i	Define tuned amplifier and list the applications of tuned amplifiers.	CO2	L1	2M
	j	Differentiate between Astable and Monostable multivibrators.	CO2	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	Construct the circuit diagram of BJT cascode amplifier and derive the expressions for Av, Ai , Ri , and Ro.	CO2	L3	5M
		OR			
3	a	List the non-ideal characteristics of a differential amplifier.	CO1	L1	4M
	b	Explain in detail about input offset voltage and input offset current of a BJT differential pair.	CO1	L2	6M

UNIT-II

4	a	Derive the break frequencies of CE (Common Emitter) amplifier at low frequencies. Obtain the expression for overall gain or transfer function and draw the frequency response.	CO2	L3	5M
	b	Draw the high frequency model of BJT.	CO1	L1	5M
		OR			
5		Derive the expressions for gain and upper 3dB frequency of a MOSFET CS amplifier operating at high frequency and draw the high frequency response.	CO2	L3	10M

UNIT-III

6	a	Explain in detail about the types of basic amplifiers used in feedback amplifier topologies.	CO3	L2	5M
	b	Draw the structure and equivalent circuit of series-shunt topology and derive the equations for Af, Rif, and Rof.	CO3	L3	5M
		OR			
7	a	Determine the frequency of oscillations for Hartley and Colpitts oscillator with suitable equation and circuit diagram	CO4	L4	
	b	In Colpitts oscillator, C1 = 0.2μF and C2 = 0.02 μF. If the frequency of oscillation is 10kHz, Calculate the value of inductor.	CO4	L4	

UNIT-IV

8	a	Derive the maximum efficiency expression for Series fed directly coupled Class A Power Amplifier.	CO3	L3	
	b	Discuss about Transformer coupled Class A Power Amplifier with diagram and determine its Maximum efficiency.	CO3	L2	
		OR			
9	a	Compare class A, class B, Class AB and Class C power amplifiers.	CO3	L2	
	b	Explain the V-I Characteristics of Power MOSFETs.	CO3	L2	

UNIT-V

10	a	Explain the operation of a single tuned capacitive coupled amplifier with a neat circuit diagram.	CO2	L2	
	b	Deduce the expressions for Quality factor, voltage gain and bandwidth of a single tuned capacitive coupled amplifier with necessary circuit diagrams.	CO2	L4	
		OR			
11		With a neat circuit diagram, explain the working of a collector coupled Astable multivibrator and draw the i/p-o/p waveforms.	CO3	L2	

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