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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular Examinations April-2026
POWER SYSTEM ANALYSIS
(Electrical & Electronics Engineering)

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

PART-A

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

1	a	Define Perunit value.	CO1	L2	2M
	b	Define per unit Impedance.	CO1	L1	2M
	c	Define Primitive network.	CO2	L1	2M
	d	What is meant by a partial network in ZBus formation?	CO2	L1	2M
	e	What is the basic assumption in Gauss–Seidel load flow?	CO3	L2	2M
	f	Define acceleration factor in Gauss–Seidel method.	CO3	L1	2M
	g	What is Unsymmetrical faults?	CO4	L1	2M
	h	Define short-circuit KVA.	CO4	L2	2M
	i	Define critical clearing angle.	CO5	L2	2M
	j	What are the different types of stability?	CO5	L1	2M

PART-B

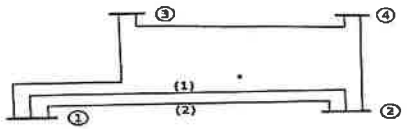
(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Define Perunit system. Give need for per unit system.	CO1	L1	5M
	b	Define the terms i) Graph ii) Sub-graph iii) Tree iv) Co-tree v) Planar Graph.	CO1	L2	5M

OR

3		For the network shown below. Draw the Oriented graph from that find Bus Incident matrix [A].	CO1	L2	10M



UNIT-II

4	a	What is a primitive network and represents its forms?	CO2	L2	5M
	b	What is Partial network? Exaplain its performance equation.	CO2	L2	5M

OR

5		Derive the necessary expressions for building up of Z-bus when New element is added to Reference.	CO2	L3	10M

UNIT-III

6	a	What is load flow analysis? What is the necessity for load flow studies?	CO3	L2	5M
	b	Explain the data for Load flow studies.	CO3	L1	5M

OR

7	a	Write step by step algorithm for Gauss-seidel method with PQ buses.	CO3	L3	6M
	b	Draw the flow chart for Gauss-Seidel method with PV buses.	CO3	L2	4M

UNIT-IV

8	a	Derive an expression for the fault current for the LLG fault. i)with impedance ii)without impedance.	CO4	L2	6M
	b	Explain about Short Circuit KVA and short-circuit current.	CO4	L5	4M

OR

9	a	Derive an expression for the fault current for the LLLG fault without impedance.	CO4	L2	5M
	b	How are reactors classified? Explain the merits and demerits of different types of system protection using reactors.	CO4	L3	5M

UNIT-V

10	a	What is stability? Explain different types of stabilities.	CO5	L1	5M
	b	What is steady state stability and define steady state stability limit.	CO5	L1	5M

OR

11		A Large generator is delivering 1.0pu power to an initiate bus through a transmission network. The maximum powerswitch can be transferred for pre fault,during fault and post fault conditions are 1.8p.u,0.4p.u and 1.3p.u respectively find the critical clearing angle.	CO5	L2	10M

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