Register Number:……..

KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

U18EEI6203: Power System Analysis

COURSE OUTCOMES

CO1: Draw the reactance diagram for a given power system network and make load flow calculations.

CO2: Model the sequence networks in terms of symmetrical components.

CO3: Calculate the fault currents, voltages when symmetrical and unsymmetrical faults occur.

CO4: Analyze the stability of power system network using various methods.

CO5: Analyze load flow, fault and stability of power system network using simulation tool.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Define Single Line Diagram.	CO1	[K_1]
2.	Define per unit value.	CO1	[K_1]
3.	Mention the properties of bus admittance matrix.	CO1	[K_1]
4.	Define short circuit capacity.	CO2	[K_1]
5.	Define sequence impedance.	CO2	[K_1]
6.	List the various types of faults occurring in a power system.	CO3	[K_1]
7.	Mention the boundary conditions for single line to ground fault when the fault occurs between line ‘a’ and ground.	CO3	[K_1]
8.	Define critical clearing time.	CO4	[K_1]
9.	List the various types of stability.	CO4	[K_1]
10.	Define steady state stability limit.	CO4	[K_1]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Two generators rated 10 MVA, 13.2 KV and 15 MVA, 13.2 KV are connected in parallel to a bus bar as shown in Figure 1. They feed supply to 2 motors of inputs 8 MVA and 12 MVA respectively. The operating voltage of motors is 12.5 KV.	16	CO1	[K_2]

Assuming the base quantities as 50 MVA, 13.8 KV, draw the per unit reactance diagram. The percentage reactance for generators is 15% and that for motors is 20%.

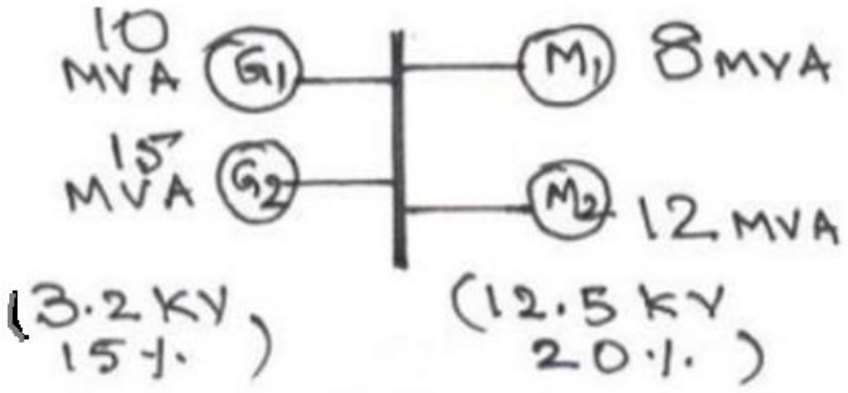

Figure 1

12.	a)	Explain the algorithm and flowchart for Gauss-siedel Load flow analysis.	12	CO1	[K_2]
	b)	Compare the advantages and disadvantages of Gauss-Siedel and Newton-Raphson Load flow analysis methods.	4		
13.	a)	Derive the expression for fault current in single line to ground (L-G) fault on unloaded generator.	12	CO2	[K_2]
	b)	Write the phase currents in terms of its sequence components using Symmetrical Component Transformation Matrix.	4	CO2	[K_2]
14.	a)	Explain the four types of modifications involved in Zbus building algorithm.	8	CO3	[K_2]
	b)	Explain about transients in R-L series circuit.	8	CO3	[K_2]
15.	a)	Mention the two factors that affect the transient stability of a power system. Explain how these factors affect the transient stability.	8	CO4	[K_2]
	b)	State and explain equal area criterion.	8	CO4	[K_2]
16.	a)	Derive the swing equation for a synchronous machine.	16	CO4	[K_2]

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