

2023-24 Even Semester

Assignment 2

Unit II: Load Flow Analysis

Subject Name: Power System - II

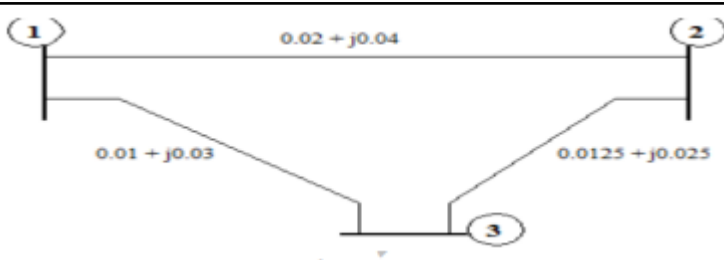
Subject Code: KEE-601

Date of Assignment:

Date of Submission: 03/05/2024

Attempt all questions. Long answer questions.

Q.No	Questions	Marks	CO	KL
1	Draw and explain the steps in flow chart for load flow solution using Gauss Seidal method when both PV and PQ buses are present.	5	3	K1
2	Explain the three types of buses in power system. Describe the power flows and calculated in load flow solution, with suitable derivations.	5	3	K4
3	Form Y bus for 4-bus system. If the line series impedances are as follows: Line (bus to bus) Impedance 1 – 2 $0.13 + j 0.4$ pu 1 – 3 $0.1 + j 0.6$ pu 1 – 4 $0.15 + j 0.5$ pu 2 – 3 $0.05 + j 0.2$ pu 3 – 4 $0.06 + j 0.3$ pu Neglect shunts capacitance of line.	5	3	K4
4	(b) Form the elements of y bus for a below network. Admittance between nodes 1 -2 is $0.02+j0.04$, between node 2-3 is $0.0125+j0.025$, between node 1-3 is $0.01+j0.03$. Assemble the YBUS and obtain the impedance metrix.	5	3	K2

				
5	Explain clearly the computational procedure for load flow solution using Newton Raphson method when the system contains only PQ buses.	5	3	K2

CO-Course Outcomes mapped with
 respective question KL- Bloom's

Knowledge Level (K1,K2, K3, K4, K5,K6)

K1 – Remember K2 – Understand K3 – Apply K4 – Analyze K5 – Evaluate K6- Create

Note: Use a Separate copy to write their answer. Avoid copying assignments

2023-24 Even Semester

Assignment 3

Unit III: Travelling Waves in Power System

Subject Name: Power System - II

Subject Code: KEE-601

Date of Assignment:

Date of Submission: 03/05/2024

Attempt all questions. Long answer questions.

Q.No	Questions	Marks	CO	KL
1	Derive the expression of reflection and refraction coefficient of voltage and current when a line is terminated by a resistance R.	5	2	K1
2	Explain Bewlays Lattice diagram with a suitable example . What information is obtained from Bewlays Lattice diagram.	5	2	K2
3	Derive the equation for a travelling wave which travels over a uniform transmission line of surge impedance Z_c .	5	2	K4
4	A travelling wave of magnitude 200 V in transmission line of surge impedance 400 ohms passes into a cable of surge impedance 40 ohms .What will be refraction voltage magnitude travelling into the cable.	5	2	K2
5	Determine the magnitudes of reflection and refraction coefficients if a travelling wave is terminated by an open circuit condition. Discuss protection of equipments and lines against travelling waves. Explain Surge impedance and velocity of propagation of travelling waves.	5	2	K2

CO-Course Outcomes mapped with

respective question KL- Bloom's

Knowledge Level (K1,K2, K3, K4, K5,K6)

K1 – Remember K2 – Understand K3 – Apply K4 – Analyze K5 – Evaluate K6- Create

Note: Use a Separate copy to write their answer. Avoid copying assignments

2023-24 Even Semester

Assignment 5

Unit V: Introduction to Power System Protection

Subject Name: Power Systems - II

Subject Code: KEE-601

Date of Assignment:

Date of Submission: 03.05.2024

Attempt all questions. Long answer questions.

Q.No	Questions	Marks	CO	K L
1	Explain the working principle of differential relay and derive its operational condition with a suitable diagram. Why restraining coil is used in differential relay?	5	5	K2
2	Explain the arcing phenomenon in circuit breaker. Define the terms restriking voltage and recovery voltage with a suitable diagram.	5	5	K2
3	Explain the low resistance and high resistance methods of arc extinction in a circuit breaker.	5	5	K2
4	Explain the term pick up value of the relay. Calculate the Breaking current of a 3 phase oil circuit breaker rated at 66 KV, 3000MVA, 1000A, 3-secs	5	5	K4
5	Explain the following terms in brief related to relay: Relay, Energizing quantity, Setting, Pickup, Drop out, Flag, Fault clearing time, Relay time, Breaker time, Overreach, Underreach.	5	5	K1

CO-Course Outcomes mapped with
respective question KL- Bloom's

Knowledge Level (K1,K2, K3, K4, K5,K6)

K1 – Remember K2 – Understand K3 – Apply K4 – Analyze K5 – Evaluate K6- Create

Note: Use a Separate copy to write their answer. Avoid copying assignments

2023-24 Even Semester

Assignment 1

Unit I: Fault Analysis in Power System- Symmetrical Components, Fault Calculations

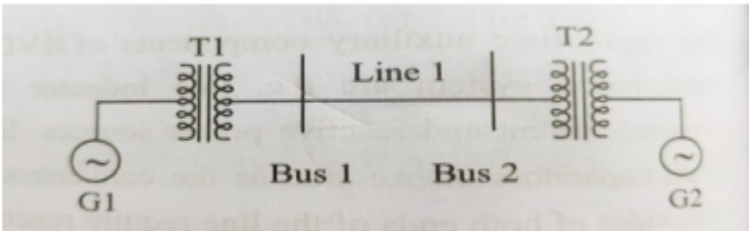
Subject Name: Power System - II

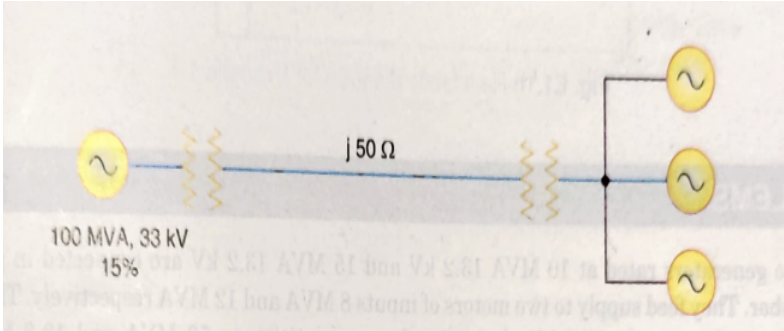
Subject Code: KEE-601

Date of Assignment:

Date of Submission: 03.05.2024

Attempt all questions. Long answer questions.

Q.No	Questions	Marks	CO	KL
1	For the following power system network shown in the figure draw a reactance diagram, the specifications of the component are as follows: G1: 25 KV, 100 MVA, X=9% G2: 25 KV, 100 MVA, X=9% T1: 25 / 220 kV, 90 MVA, X=12% T2: 220 KV/25 kV, 90 MVA, X=12% Transmission Line 1: 220 KV, X=150 ohms Choose 25 KV as the base voltage and 200 MVA as the MVA base. 	5	1	K4
2	For a 3 phase power supply, derive the equations in terms of positive, negative and zero sequences.	5	1	K3
3	A 100 MVA 33 kV 3 phase generator has a subtransient reactance of 15%. The generator is connected to the motors through a transmission line and transformers as shown in the fig. The motors have rated inputs of 30 MVA, 20 MVA and 50 MVA at 30 kV with 20% subtransient reactance. The 3 phase transformers are rated at 110 MVA, 32 kV delta/ 110 kV star with leakage reactance of 8%. The line has reactance of 60 ohms. Selecting the generator rating as the base quantities in the generator circuit, determine the base quantities in other parts of the system and evaluate the corresponding per unit values.	5	1	K4

				
4	Derive an expression for a fault current when L-G fault occurs in the line and draw the sequence network showing inter-connections.	5	1	K3
5	2. A 25 MVA ,13.2KV alternator with solidly grounded neutral has a sub transient reactance of 0.25p.u . The negative and zero sequence reactance are 0.35 and 0.1 p.u respectively. A double line to ground fault occurs at the terminals of unloaded alternator derive the expression for fault current and compute the same , in all the phase	5	1	K4

CO-Course Outcomes mapped with

respective question KL- Bloom's

Knowledge Level (K1,K2, K3, K4, K5,K6)

K1 – Remember K2 – Understand K3 – Apply K4 – Analyze K5 – Evaluate K6- Create

Note: Use a Separate copy to write their answer. Avoid copying assignments

2023-24 Even Semester

Assignment 4

Unit IV: Stability in Power System

Subject Name: Power System - II

Subject Code: KEE-601

Date of Assignment:

Date of Submission: 03.05.2024

Attempt all questions. Long answer questions.

Q.No	Questions	Marks	CO	K L
1	Derive the swing equation for a machine connected to an infinite bus.. If a synchronous generator is of 100MVA have inertia constant of 20MJ/MVA. Find the angular momentum.	5	4	K4
2	Derive an expression for maximum power between two nodes. Show that this power is maximum when $x = 3R$, where X is the reactance and R is the resistance and torque angle is 600 .	5	4	K4
3	Explain Equal Area criteria by taking suitable example of Power System taking any two cases.	5	4	K2
4	Mention the various factors to improve transient state stability. Define accelerating power P_a	5	4	K1
5	Derive the equation for power flow in transmission line.	5	4	K4

CO-Course Outcomes mapped with
 respective question KL- Bloom's
 Knowledge Level (K1,K2, K3, K4, K5,
 K6)

K1 – Remember K2 – Understand K3 – Apply K4 – Analyze K5 – Evaluate K6- Create

Note: Use a Separate copy to write their answer. Avoid copying assignments