Exam.Code:1017
Sub. Code: 7779

1079

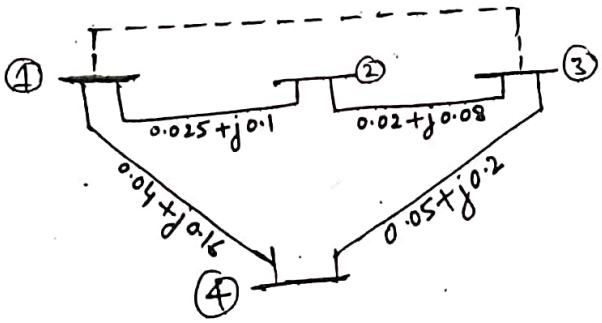
M.E. Electrical Engineering (Power Systems)
First Semester
EE-8101: Advanced Power System Analysis

Time allowed: 3 Hours

Max. Marks: 50

NOTE: *Attempt any five questions. Assume any missing data.*

x-x-x

Q I	How does the tap changing transformer affect the admittance matrix? Hence find the admittance matrix for the 4-bus system shown below. How is Y_{BUS} modified if the new line between 1-3 is introduced having impedance of 0.1+j0.4 p.u. 	**(10)**
Q II	What is meant by Load flow solution? Hence explain the importance of slack bus and discuss the three phase load solution?	**(10)**
Q.III	A 3-phase load has Z_1= (1+j2)Ω and Z_2= (1.1+j0.6)Ω and it is fed by 3-phase supply of 415 V. The phase 'a' of the load get open circuited and load is fed continuously. Find the phase voltages, currents and V_{Nn}.	**(10)**
Q.IV	Use Fast- Decoupled method to obtain voltage V_2 and V_3 in a 3-bus 3-line system if all the lines have series impedances of 0.5+j0.6 per unit and total shunt admittance of 0.04 per unit. Take Base MVA as 100.	**(10)**

Bus no.	Voltage (p.u.)	P_d (pu)	Q_d (pu)	P_g (MW)	Q_g (MVAR)
1	1.01	1	0.75	-	-
2	-	0.5	1	0	0
3	1.02	1.2	0.5	0.5	0.3

Q.V	How and where do we use DC load flow method? Hence deduce the sequence solution to AC-DC load flow problem.	**(10)**
Q.VI	Derive the expression for the fault currents and voltages when a 3LG fault occurs on bus P in a power system network. Also deduce the expression for the voltages on all other buses other than faulted bus P.	**(10)**
Q.VII	Find the optimal generation schedule for each generator which are connected through a transmission line and supplying a load of 200MW and 100 MW at bus 1 and bus 2 respectively. The incremental cost curves of the generators are given as: $IC_1 = 0.003P_{G1} + 2.1 \ \$/MWh$ $IC_2 = 0.004P_{G2} + 3.1 \ \$/MWh$ The power loss in the transmission line is $P_L = 0.001(P_{G2} - 100)^2$.	**(10)**
Q.VIII	Explain the methods of least square as used for state estimation in a power system studies.	**(10)**

x-x-x