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YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY,FARIDABAD
M.TECH EXAMINATION , DEC-2017
Computer Simulation In Power Systems [EL-607-C]

ime : 3 Hrs. M. Marks:75

lote : Part -1 is compulsory. Attempt any four out of 6 questions in part -2

Part-1

Q1. Short answer type questions. Attempt all the questions in about 20 to 40 words (1.5*10)

a) Newton Raphson method is preferred to Gauss-seidal method for load flow studies in power systems. Why?

b) Why is a Bus admittance matrix a sparse matrix.

c) What is contingency selection? How it is done?

d) Discuss. Why a direct solution of load flow problem is not possible?

e) Why a 3-phase fault on a transmission line more severe than other faults?

f) Categorize the various types of unsymmetrical faults and state the order of frequency of occurrence of shunt faults

g) Discuss LU factorization.

h) The Z_{bus} method is very suitable for fault studies on large systems. Why?

i) What is the importance of sequence networks in unsymmetrical fault calculations?

j) Discuss maximum likelihood weighted least square error estimation.

Part-2

Q2.a) Give a flow chart for load flow study using Newton Raphson method. How does the method get modified when PV buses are also present. (7.5*2)

b) For the power system network shown in fig.1, compute the bus voltages using the Gauss-Seidal iteration Method. Line reactance and loads are shown in the figure. Bus1 is the slack bus and buses 2 and 3 are the load and voltage control buses respectively. Assume tolerance equal to 0.00001.

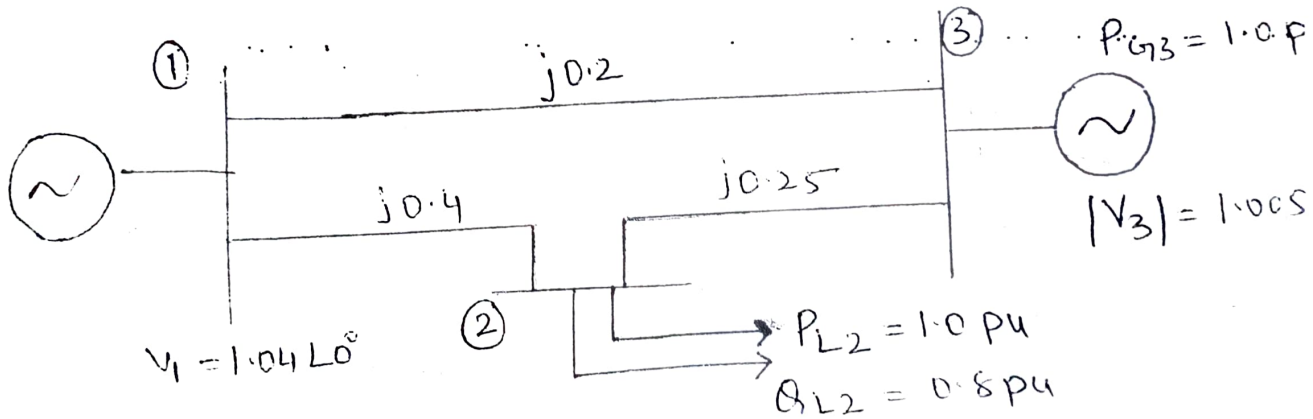

Fig.1.

Q3.a) Derive the necessary equations to determine the fault current for a single line to ground fault. Draw a diagram showing the interconnection of sequence networks. (7.5*2)

b) A 50MVA, 11KV, 3 phase alternator was subjected to different types of faults.

The fault currents were:

3 phase fault - 1870A, Line to line fault- 2590A, Single line to ground fault- 4130 A

The alternator neutral is solidly grounded. Find the per unit values of the three sequence reactances of the alternator.

Q4 a) What is AC- DC load flow? How it is done? (7.5*2)

b) What are regulating transformers? Discuss their utilization for voltage magnitude and phase angle control.

Q5.a)Draw the oriented graph and determine the Y_{BR} and Z_{Loop} for the power system shown in fig.2 (7.5*2)

ii) Prove $A_b K^T = [U]$ for the power system network shown in fig.2

Q6. Write short notes on (7.5*2)

i) Fast Decoupled load flow method

ii) Sparsity in power system

Q7. Formulate positive and negative sequence impedance matrices for the network shown in fig.3 (15)

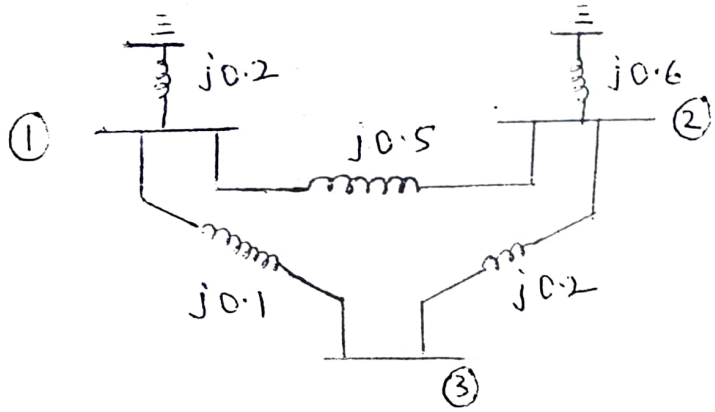

Fig.2.

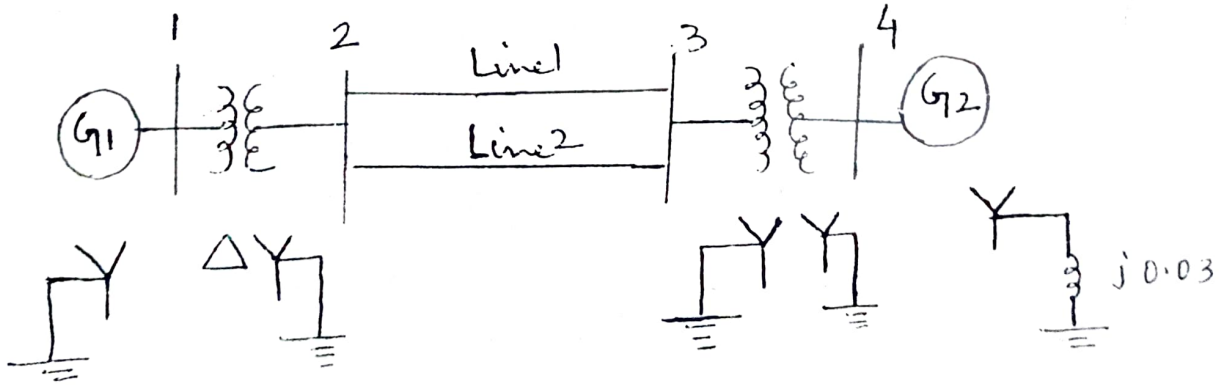

Fig.3.