Reg. No. : | | | | | | | | | | |

Question Paper Code: 31353

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Electrical and Electronics Engineering

01UEE503 – POWER SYSTEM ANALYSIS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the advantages of per phase analysis in power system?
2. Write the expression for determining base impedance.
3. Mention the advantages of Gauss-Seidel method of load flow analysis.
4. Give any two operating constraints imposed in load flow studies.
5. What are the causes for faults in power system?
6. What is meant by prefault and postfault voltage/current?
7. List the types of unsymmetrical faults.
8. What is ‘a’ operator?
9. Write down the power angle equation of a two machine system.
10. How the stability of a system is identified from the swing curve?

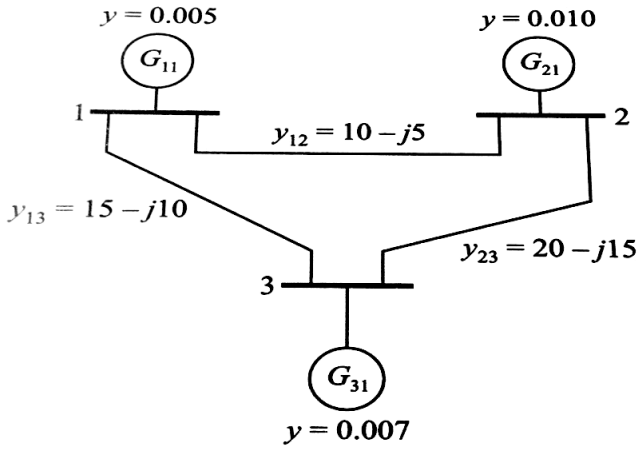
PART - B (5 x 16 = 80 Marks)

11. (a) (i) Two generators rated at 10*MVA*, 13.2*KV* and 20*MVA*, 13.2*KV* are connected in parallel to a bus bar. Two motors of input 8*MVA*, 12.5*KV* and 12*MVA*, 12.5*KV* are drawn supply from bus bar. Take x_g'' = 15% and x_m'' = 20%. Draw the single line diagram and calculate the new P.U. impedance for the power system components. Assume generator1 rating as base quantities. (10)

(ii) Briefly discuss about power system components. (6)

Or

(b) Determine the $[Y_{bus}]$ matrix of the representative power system shown in figure . (16)



12. (a) Obtain the power flow solution for the first iteration by the Fast Decoupled Method for the system shown below. Buses 1 and 3 are generators. The magnitude of voltage at bus1 is 1.05*p.u*. Voltage magnitude at bus3 is fixed at 1.04*p.u* with a real power generation of 200*MW*. Loads are taken from bus2. Line impedances are given in *p.u* on a 100*MVA* base and the line charging susceptances are neglected. (16)

Or

(b) Write the algorithm and flow chart of the FDLF method. (16)

13. (a) (i) Derive the expression for short circuit capacity for a single phase and three phase system. (10)

(ii) Discuss the assumption made in short circuit analysis. (6)

Or

(b) Write the steps for the fault calculation of an *n* bus system using bus impedance matrix. (16)

14. (a) Explain the sequence networks and sequence impedance for an unbalanced generator and transmission lines. (16)

Or

(b) Derive the equation of fault current for an L-L fault in power system. (16)

15. (a) Explain the step by step procedure to obtain the solution of swing equation by Modified Eulers method. (16)

Or

(b) What is the principle behind the equal area criterion in determining stability? Explain the equal area criterion to a single machine connected to infinite bus system. (16)

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