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

Question Paper Code: 35303

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

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. Differentiate generator bus and slack bus.
5. What are the causes for faults in power system?
6. Define short circuit capacity.
7. List the types of unsymmetrical faults.
8. What are the properties of sequence operator '*a*'?
9. Suggest any two ways to improve transient stability of a power system.
10. Mention the applications of swing curves.

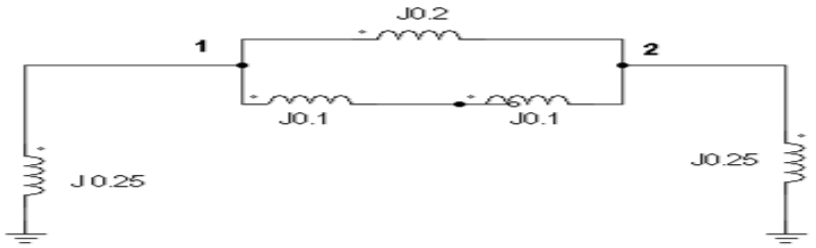
PART - B (5 x 16 = 80 Marks)

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) Form the Y Bus matrix for the network shown below using singular transformation method. The given values are primitive admittances. (16)



12. (a) Construct the equations to determine the jacobian matrices for Newton Raphson method to solve load flow for an n bus system with a slack bus and load buses. (16)

Or

(b) Construct an algorithm using Gauss-Seidal method to determine load flow solution for a power system network with PQ buses alone. (16)

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

Or

(b) Construct the positive sequence, negative sequence and zero sequence impedance networks of a transformer using the concept of symmetrical components. (16)

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

Or

(b) A three phase transmission line operating at 33 KV and having a resistance and reactance of 5 ohm and 20 ohm respectively is connected to a generating station bus bar through a 15 MVA, 11/33 KV step up transformer which has a reactance of 0.06 p.u. The two generators are rated 10 MVA and 5 MVA with reactance of 0.1 p.u and 0.075 p.u respectively. Calculate the short circuit MVA and the fault current when a 3 phase short circuit occurs at the at the load end of the transmission line. (16)

15. (a) Derive the equation for critical cleaning angle determination. (16)

Or

(b) Illustrate the concept of equal area criterion and its applications. (16)