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

Question Paper Code: 35303

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fifth Semester

Electrical and Electronics Engineering

01UEE503 – POWER SYSTEM ANALYSIS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

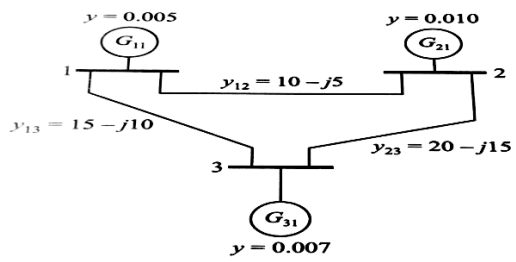
Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Draw the equivalent circuit of a two winding transformer.
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. Show that neutral current is zero in balanced three phase circuit.
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) Determine the [Y_{bus}] matrix of the representative power system shown in figure. (16)



Or

(b) 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. (16)

12. (a) Write the algorithm and flow chart of the FDLF method. (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) Construct the positive sequence, negative sequence and zero sequence impedance networks of a synchronous machine on no-load using the concept of symmetrical components. (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) Explain the sequence networks and sequence impedance for an unbalanced generator and transmission lines. (16)

15. (a) Consider a solidly grounded 50 Hz machine for which H= 2.4MJ/MVA and it is normally operating in steady state with input and output of 1 p.u and an angular displacement of 45 electrical degree with respect to an infinite bus bar. Upon occurrence of a fault assume that the input remains constant and the output is given by $P_e = \delta/80$.Calculate and plot swing curve by step by step method. Using the time interval $\Delta t = 0.05$ s up to t=0.5s. (16)

Or

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