Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (EE) PT   (Sem.–9)
POWER SYSTEM ANALYSIS
Subject Code : BTEE-801
M.Code : 75642

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

1. What is meant by fault level?

2. What are the approximates in short circuit analysis?

3. What are the current limiting reactors?

4. Name the fault which do not have zero-sequence currents flowing.

5. Draw the zero-sequence network for a star connected generator earthed through a resistance R.

6. Write the general expression for complex power injected by the source into i^{th} bus of a power system.

7. What is meant by acceleration factor in load flow solution and its best value?

8. Define steady state stability.

9. What is meant by power angle curve?

10. Write swing equation for single machine system.

SECTION-B

11. Explain the positive, negative and zero sequence components. Also mention its significance in Power System Analysis. Discuss the limitations of sequence components.

12. A single phase transformer is rated 100kVA, 11/0.4 kV. Its leakage reactance is 0.15 Ω when referred to low voltage side. Determine its leakage reactance in percent and per unit.

13. What are the causes of unsymmetrical faults in power system? Derive an expression for the fault current for a single line to ground fault.

14. Discuss the advantages of using Y_{bus} model of power system network for load flow analysis.

15. A 100 MVA synchronous generator operates on full load at a frequency of 50 Hz. The load is suddenly reduced to 50 MW. Due to time lag in governor system, the steam valve begins to close after 0.4 second. Determine the change in frequency that occur in this time. Given H = 5 kW- s/kVA f generator capacity.

SECTION-C

16. A generator operating at 50 Hz. Delivers 1 pu power to an infinite bus when a fault occurs and reduces the maximum power transferable to 0.4 pu. The maximum power transferable before the occurrence of fault was 1.75 pu. The maximum power transferable after clearance of the fault is 1.25 pu. Compute critical clearing angle.

17. Derive the load flow algorithm using Neuton Raphson method with flow chart and discuss the advantages of the method.

18. A 3phase star connected alternator is rated 30 MVA, 13.8 kV and has the following sequence reactance values: $X_1 = 0.25$ pu; $X_2 = 0.35$ pu; and $X_0 = 0.10$ pu. The neutral of the alternator is solidly grounded. Determine the alternator line currents when a double line to grounds fault occurs on its terminals. Assume that the alternator is unloaded and is operating at rated voltage when the fault occurs.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.