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Total No. of Pages : 02

Total No. of Questions : 09

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

1. Write briefly :

(a) What is Multi-machine stability?

(b) Write down the balanced and unbalanced faults occurring in a power system.

(c) What is meant by percentage reactance?

(d) What is meant by base quantities?

(e) What are the uses of symmetrical components in power system?

(f) For a fault at a given location rank the various fault in the order of severity.

(g) What are the quantities specified at generator bus.

(h) How is the swing bus selected in load flow study?

(i) Define Stability limit.

(j) Define Infinite bus in a power system.

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SECTION-B

2. A double line to ground fault occurs on phase b and c of an unloaded generator. Derive a sequence network representation of this condition and determine the fault current.

3. Develop necessary equations and describe the load flow solution using Gauss Seidel method.

4. A 2 pole, 50 Hz, 11kV, turbo alternator has a rating of 60 MW, power factor 0.85 lagging. Its rotor has a moment of inertia of 8800 kg-m^2. Calculate its inertia constant in MJ per MVA and its momentum in MJ-s/electrical degree.

5. What do you understand by "PER UNIT SYSTEM"? What are the significances in power system analysis? Also mention its limitations.

6. Derive Swing equation to find out transient stability of power system.

SECTION-C

7. Derive an expression for the critical clearing angle and clearing time.

8. Derive the static load flow equations of power system. Explain the Neuton Raphson method of solving the load flow equations.

9. A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub transient reactance of 0.25 pu. The negative and zero sequence reactances are 0.35 pu and 0.1 pu respectively. A single phase to ground fault occur at the terminal of this unloaded generator. The fault impedance is j0.1 pu. Compute fault current, terminals voltages under faulted condition. Express all currents and voltages under faulted condition as a percentage of rated values. Express sequence components of currents in the form of percentage of full load current.

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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.

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