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Total No. of Questions : 08

M.Tech. (Electrical Power System) (2018 Batch) (Sem.–1)

POWER SYSTEM ANALYSIS

Subject Code : EEPS-101-18

M.Code : 75731

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWELVE marks.**

1 Explain the computational procedure for load-flow solution using Newton-Raphson method when all types of buses are available in the system.

2. The resistive network shown in the figure is supplying a load 0.5 pu over a line with resistance of 0.4 pu. Bus 1 is assumed to be slack bus, having a voltage of 1.0 pu.

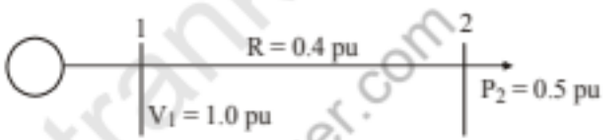

FIG.1

Using the Newton-Raphson method, calculate: (minimum 2 iterations)

a) Voltage at load bus 2

b) Current in line 1-2

c) The slack bus power

d) Power loss in the line

3. a) Discuss the mechanism of voltage collapse in a power transmission system.

b) A 50 Hz turbo-generator is rated 500 MVA, 22kV. It is Y-connected, solidly grounded and is operating at rated voltage at no load. It is disconnected from the rest of the system. Its reactances are, $X_d'' = X_1 = X_2 = X_0 = 0.05$pu.

Find the ratio of the subtransient line current for a L-L fault to the subtransient current for a symmetrical three phase fault on the generator.

4. What are the power modelling techniques followed for the Contingency Analysis and which power system model is preferred the most and why?

5. What is the significance of the network sensitivity factors for determining and for quick calculation of possible overloads in a power network? Briefly explain the above using the Generation shift factors and Line outage Distribution factors. No derivations are required.

6. a) What are effective counter measures undertaken to prevent or contain Voltage instability?

   b) What effective methods are employed for improving the voltage stability?

7. How the PV characteristics with constant load power factor affect the voltage that follows the stability of the power system? Explain in detail using PV curves for various power factors.

8. '*The ability to detect and identify bad measurements is significantly important to a load dispatch centre*'. How is the 'Bad Data' Identified so that it could be removed from the vector of measurements before it is processed for a better and reliable State Estimation?

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.