Code No.: 9A02602/R09

B.Tech. III Year II Semester Regular and Supplementary Examinations **Set-3**

April/May - 2013

POWER SYSTEM ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 Hours   Max. Marks: 70

*Answer any **FIVE** Questions*

*All Questions carry **Equal** Marks*

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1. (a) Discuss about steps involved in solving a problem using digital computer.

   (b) Derive bus admittance matrix using singular transformation.

2. Derive the necessary equations for modifying Z_{BUS} elements when an element having mutual impedance with one or more elements has been disconnected from the network.

3. Derive fundamental equations for load flow studies and also write the assumptions and approximations to get the simple equations.

4. Explain and derive necessary equations to carry out NR method of load flow solution in polar coordinates.

5. (a) What are the advantages of P.U. system?

   (b) A 30 MVA, 11 kV generators has a reactance of 0.2 P.U. referred to its ratings as bases. Determine the P.U. reactance when referred to base kVA of 50,000 kVA and base kV = 22 kV.

6. A synchronous generator is rated 25 MVA, 11 kV. It is star connected with the neutral point solidly grounded. The generator is operating at no load at rated voltage. Its reactances are $X = X_2 = 0.20$ and $X_0 = 0.8$ pu. Calculate the symmetrical subtransient line current for,

   (i) Single line to ground fault

   (ii) Double line fault

   (iii) Double line to ground fault and

   (iv) Symmetrical three phase fault.

   Compare these currents and comment.

7. How do you broadly define and classify power system stability? Establish the concept of power system stability analytically.

8. What is equal area criterion? Interpret this for a case when there is a sudden short circuit at one end of one of the line of parallel lines.