Sub Code: MPST101 **ROLL NO.**

Model Question Paper

COURSE: M.TECH. **BRANCH**: POWER SYSTEM

SEMESTER: 1 **SUBJECT**: POWER SYSTEM ANALYSIS

Duration: 3:00 hrs **Max marks: 100**

Note: Attempt all questions.

1. **Attempt any four parts of the following.** **5x4 =20**

   A. Describe generator shift distribution factors.

   B. Define observability analysis in state estimation.

   C. Enumerate the numerical methods used for the analysis of transient stability.

   D. Write note on continuation power-flow analysis.

   E. Define following terms: Tie set, cut set, incidence matrix, graph.

2. **Attempt any two parts of the following.** **10x2=20**

   A. Justify the need to study symmetrical component of unbalanced phasors.

   B. Describe the Algorithm for contingency analysis with the help of flow chart.

   C. Discuss the methods to improve steady state and transient stability.

3. **Attempt any two parts of the following.** **10x2=20**

   A. Deduce an expression for L-G fault on an unloaded generator with its neutral grounded through an impedance Z_n. Also take the effect of fault impedance into account. Draw the sequence network diagram for the same.

   B. Determine the symmetrical component of current in a three phase system ,the original phasors of which are : I_a=12, I_b =12, I_c=-15.

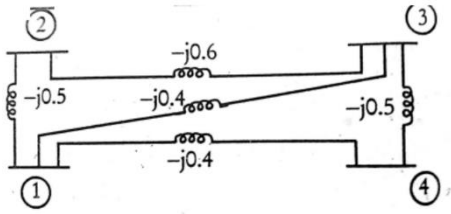
   C. Give a comparison between WLS and iterated kalman-filter algorithm for integrating PMUs.

4. **Attempt any two parts of the following.** **10x2=20**

   A. Comment rationally on power flow analysis in integrated AC-DC Systems.

   B. Explain the process of finding the bad data. Also enumerate its importance in state estimation.

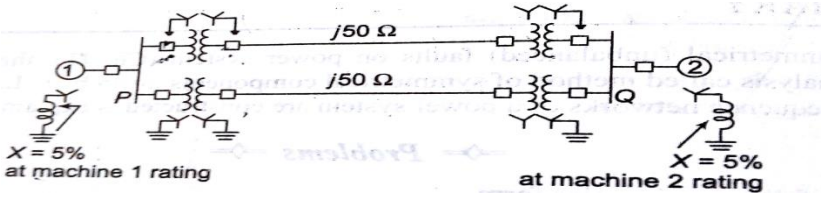
C. For the network shown in Fig, form the bus admittance matrix. Determine the reduced admittance by eliminating node 4. The values are marked in p.u



5. Attempt any two parts of the following. 10x2=20

A. Compare Gaus - Siedel method with Newton – Raphson method when a Y-Bus matrix is used for problem formation..

B. Draw the positive, negative and zero sequene impedance networks for the power system. Choose a base of 50 MVA, 220kV in the 50 ohm transmission lines.



C. Below are two data strings that have been corrupted by cosmic ray glitches. Look through the data and use the right-most parity bit to identify all the bad data. Create a valid data string that has been 'de-glitched'.

The highlighted data words are the corrupted ones.

String 1: 10111010 **11110101** 10111100 11001011 00101101 **01010000 01111010** 10001100 00110111 00100110 01111000 **11001101** 10110111 **11011010** 11100001 **10001010** 10001111 01110011 **10010011** 11001011

String 2: 10111010 01110101 10111100 **11011011** 10101101 01011010 01111010 **10001000 10110111 10100110 11011000** 11001101 10110101 11011010 11110001 10001010 **10011111** 01110011 10010001 **01001011**