2054
B.E. (Electrical and Electronics Engineering)
Sixth Semester
PC-EE-601: Computer Aided Power System Analysis (CAPSA)

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt __five__ questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.* **Students can assume missing data.**

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I. Attempt the following: -
   (a) What is role of fault analysis in power system protection?
   (b) What are the advantages of per unit system?
   (c) What is role equal area criteria for stability analysis?
   (d) What is the role of tie line in LFC?
   (e) Draw Sequence networks of transmission lines.

   (5×2)

UNIT-I

II. (a) Discuss with the help of block diagram the load frequency control concept in two area system.
    (b) What is swing equation? Discuss mathematical method to solve it.

   (5,5)

III. For the given circuit as shown below when a three phase fault is applied on one and of the line near to the circuit breaker 4. Find the critical fault clearing angle for clearing the fault with simultaneous opening of breaker CB2 and CB4 the generator is the living the generator is delivery one for unit make award at the instant preceding the fault all the per unit quantities are on common MVA.

$V = 1.0 \angle 0°$

$E' = 1.43$

                                                              (10)
                                                              P.T.O.
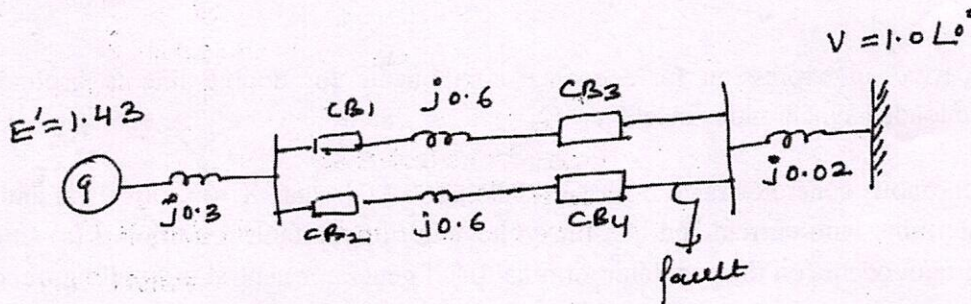
IV. Determine V_2 and V_3 by NR method after 2 iterations. The per unit values of line impedances are as shown.
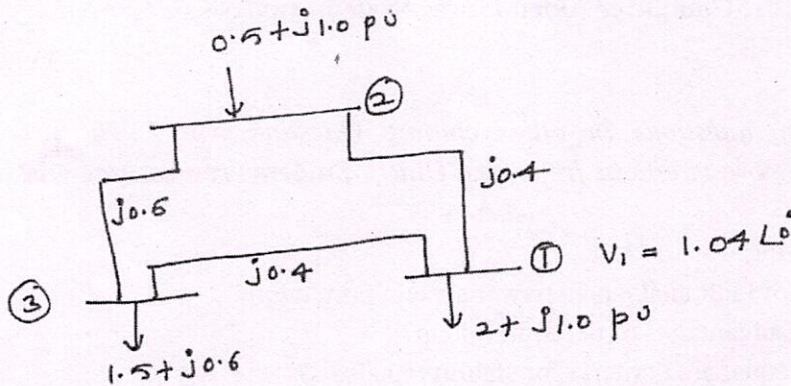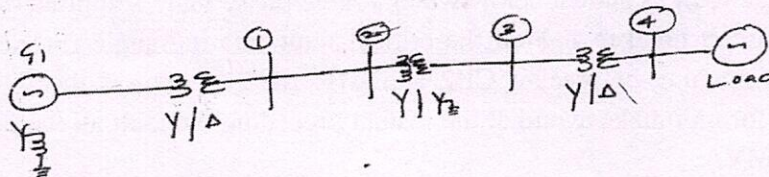

(10)

UNIT-II

V. (a) Drive sequence networks for star connected load grounded through impedance.

(b) Obtain the symmetrical components of the following unbalanced faults:

$$I_R = 50 \angle 50^0 \quad I_Y = 150 \angle 30^0 \quad I_B = 30 \angle 120^0$$

(5,5)

VI. (a) Draw the positive negative and zero sequence impedance diagram of a given circuit.

(b) Derive an expression for sequence components for double line to ground fault on unloaded synchronous machine.

(5,5)

VII. A synchronous generator rated 3-phase, 11 kV, 100 MVA has $X_1 = X_2 = j0.1$ pu and $X_0 = j0.04$ pu. Determine fault current and line-line voltage during the fault condition if (a) single line to ground fault occurs on the generator terminal (b) if generator neutral is solidly grounded.

(10)

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