

[6262]-69

T.E. (Electrical)

POWER SYSTEM - II

(2019 Pattern) (Semester - II) (303148)

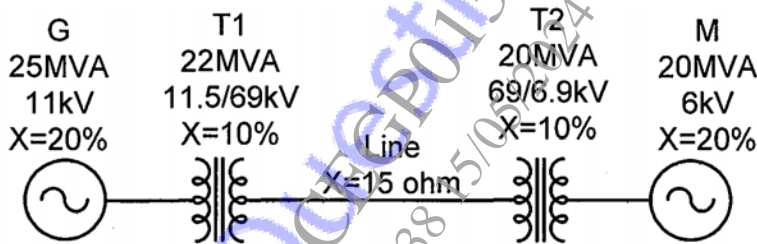
Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Use of Calculator is allowed.
- 5) Assume Suitable data if necessary.

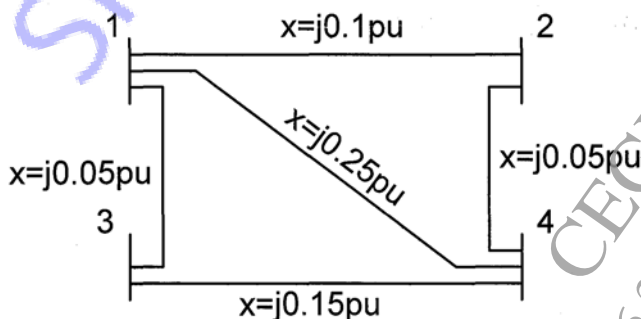
Q1) a) Take base MVA = 25MVA and base kV = 69kV on transmission network and draw per unit reactance diagram to these base values. [10]



b) What are the assumptions made in fast decoupled load flow? Elaborate each assumption with justification. [7]

OR

Q2) a) Find the Y-BUS of the following system. [10]

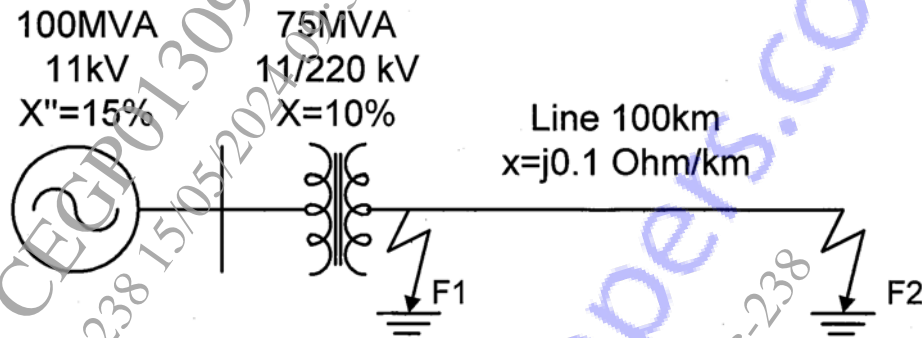


b) State the advantages and disadvantages of per unit system in power system analysis. [7]

P.T.O.

- Q3) a)** Calculate fault current in kA, if the three-phase bolted fault is [10]
- at point F1 and
 - At point F2.

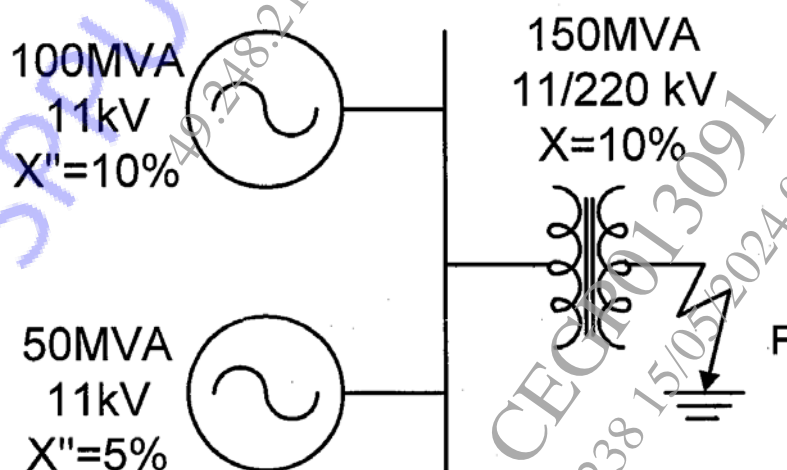
(Take base of 11kV and 100MVA on generator)



- b)** State whether the following statements are true or false with justification [7]
- In case of a phase fault at the terminal of an unloaded alternator, the sub-transient state current is smaller than the transient and steady state current.
 - The three-phase fault is more severe when the fault is far away from the generator terminal.

OR

- Q4) a)** If three-phase fault occurs at point F, find the fault current supplied by each generator in kA. Take base of 100MVA, 11kV on generator side. [10]



- b)** What are the different types of current limiting reactors? Explain any one in detail with advantages and disadvantages. [7]

Q5) a) A three-phase 100MVA synchronous generator with line-to-line voltage of 11kV is subjected to a line-to-ground fault. The sequence reactance are $x_1 = j0.3pu$, $x_2 = j0.1pu$ and $x_0 = j0.05pu$. [10]

i) Find the fault current supplied by the alternator.

ii) If the neutral of the alternator is ground through a resistance of 0.1 pu, find the fault current.

b) In three phase transmission line, show that positive, negative and zero sequence impedance $Z_1 = Z_2 = Z_s - Z_m$ and $Z_0 = Z_s + 2Z_m$ where Z_s is self impedance and Z_m is mutual impedance of lines. [8]

OR

Q6) a) Across a star-connected symmetrical impedance load of 10Ω is have per phase voltage of $V_a = 100\angle 0^\circ V$, $V_b = 95\angle -120^\circ V$, $V_c = 105\angle 115^\circ V$. Find line currents using symmetrical components. [10]

b) Derive the equation of fault current in line to line fault. [8]

Q7) a) Draw the complete single line diagram of HVDC system showing all components and elaborate on any three components in detail. [10]

b) Compare HVDC and EHVAC transmission systems. [8]

OR

Q8) a) What are different types of HVDC link? With neat diagram, elaborate each type in details. [10]

b) What are different control strategies used in HVDC transmissions? Elaborate any two in detail. [8]

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