

Total No. of Questions : 8]

SEAT No. :

PC1750

[6353]-68

[Total No. of Pages : 3

T.E. (Electrical Engineering)

POWER SYSTEM-II

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

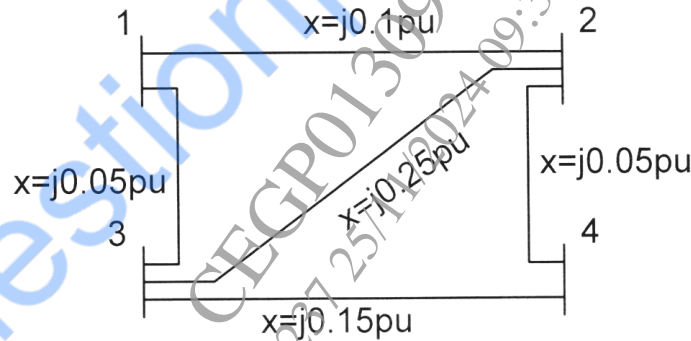
Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of Calculator is allowed.
- 5) Assume suitable data if necessary.

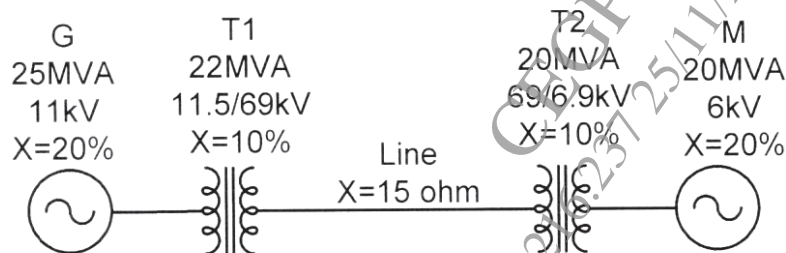
Q1) a) Find the Y-BUS of the following system. [10]



b) Prove that per unit impedance of a transformer referred to primary and secondary is same. [7]

OR

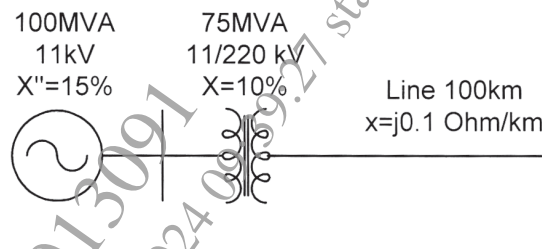
Q2) a) Take base MVA = 25MVA and base kV = 11kV on the generator and draw per unit reactance diagram to these base values. [10]



b) Give a detail classification of the buses used in load flow analysis. [7]

P.T.O.

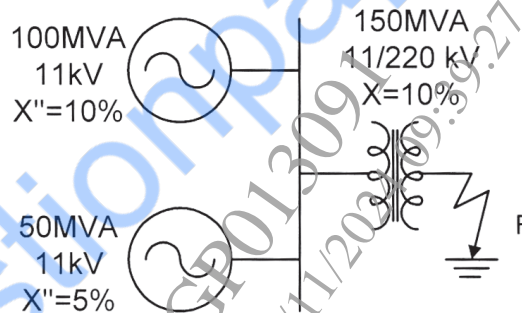
- Q3) a)** Calculate fault current (in kA) supplied by the alternator and terminal voltage of the alternator, if the three-phase bolted fault occurs at point F. Take base at 100MVA, 11kV on alternator. **[10]**



- b) Write short note on “Tie Bar Current Limiting Reactors.” **[7]**

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) State whether the following statements are true or false with justification **[7]**

- i) In case of a phase fault at the terminal of an unloaded alternator, the subtransient state current is greater than the transient and steady state current.
- ii) The current limiting reactor is used to increase the fault level..

- Q5) a)** Three phase voltages are given by $V_a = 100\angle 0^\circ V/ph$, $V_b = 95\angle -120^\circ V/ph$, $V_c = 105\angle 115^\circ V/ph$ and currents are given by $I_a = 10\angle -30^\circ A$, $I_b = 9.5\angle -150^\circ A/ph$, $I_c = 10.5\angle 85^\circ A/ph$. Calculate three phase sequence voltage and current of phase A and apparent power using symmetrical components. **[10]**

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

OR

Q6) a) A 50MVA, 11kV, three phase synchronous generator was subjected to different types of faults without fault impedance. The generator neutral is solidly grounded. Find the per unit values of three phase sequence reactance of the generator if the fault currents are as follows: [10]

$$LG_{\text{fault}} = 4200A, LL_{\text{fault}} = 2600A, LLL_{\text{fault}} = 2000A.$$

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

Where Z_s is self impedance and Z_m is mutual impedance of lines.

Q7) a) Write short note on [10]

i) Bipolar HVDC link

ii) Back to back HVDC station

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

OR

Q8) a) Draw the complete single line diagram of HVDC system showing all components and elaborate on any three components in detail. [10]

b) Explain constant current control used in HVDC transmission. [8]

