Total No. of Questions : 8]

SEAT No. : [ ]

PA-1462

[Total No. of Pages : 3

[5926]-79

T.E. (Electrical)

POWER SYSTEM-II

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

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3. orQ4, Q5 or Q6, and Q7 or Q8.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figure to the right side indicate full marks.***
4) ***Use of a calculator is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Give the detailed classification of buses used in load flow analysis. **[6]**

b) Show that per unit impedance of the transformer referred to primary and secondary is same. **[6]**

c) Impedances (in pu) between buses are given in the following Fig. Calculate the Ybus of the system. **[6]**

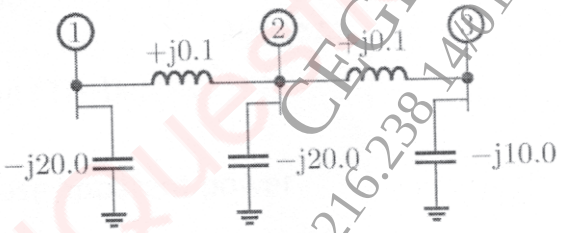

Fig Q1 C)

OR

Q2) a) The base of the three-phase system is 100MVA and 10kV. Calculate base impedance and base current. Let the impedance of any part is given as 0.5 pu on 100MVA, 10kV base. If the base is changed to 200MVA, 5kV. What is the base impedance? **[6]**

b) Derive load flow equation for 'n' bus system. **[6]**

c) What is per unit system? State the advantages and disadvantages. **[6]**

P.T.O.

Q3) a) If the three-phase fault is taken place at point F, find the fault current supplied by each generator. Take 100MVA, 11kV as a base value on the generator. **[12]**

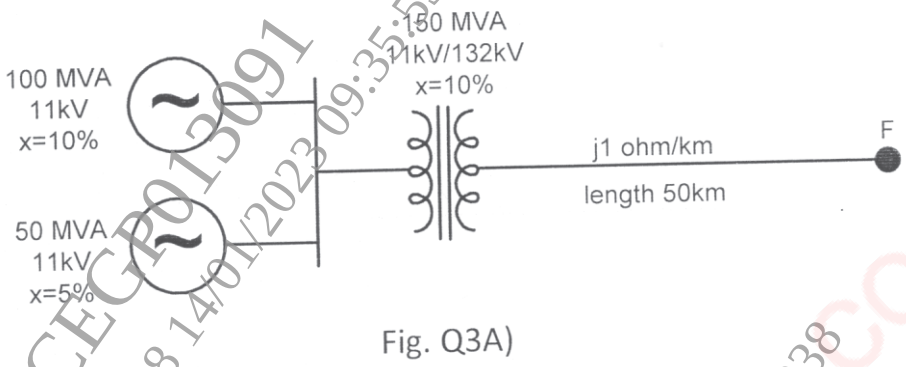

Fig. Q3A)

b) Draw the nature of fault current, if the symmetrical fault is taken place at the terminal of an unloaded alternator. clearly mark the sub-transient, transient and steady state period. **[6]**

OR

Q4) a) Find the fault current, if there phase fault is taken place at F2, determine voltage at generator terminal and HV side of the transformer. **[12]**

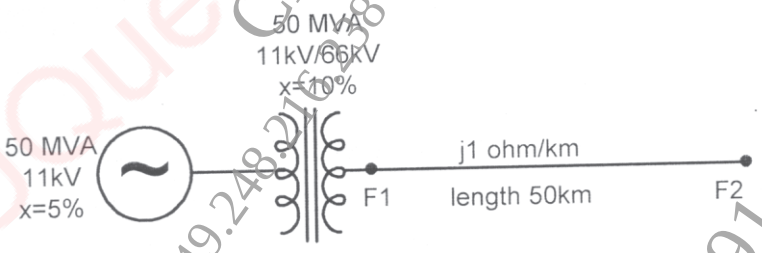

Fig Q4A)

b) Write a short note on "Tie-bar" **[6]**

Q5) a) Prove that three-phase apparent power $S_{abc}=3S_{012}$

WhereS_{abc}=*Apperant power in three phase form and*

S_{012}=*Apperant power in sequence quantity form.* **[6]**

b) Draw a zero-sequence diagram for the following transformer connection **[6]**

i) Delta-Delta transformer.

ii) Delta-star connected transformer with neutral grounded with impedance.

c) For a fully transposed transmission line, Self-impedance is J10 ohm and mutual impedance is J2 ohm, calculate positive, negative and zero sequence impedances of the line. **[6]**

OR

Q6) a) Derive the equation for fault current in LL fault. **[9]**

b) A 20-MVA, 6.6-kV, 3-Phase alternator is connected to a 3-Phase transmission line. The per unit positive, negative and zero-sequence impedances of the alternator are j0.5, j0.05 and j0.04 respectively. The neutral of the alternator is connected to the ground through an inductive reactor of j0.05 p.u. The per unit positive, negative and zero-sequence impedances of the transmision line are j0.5, j0.5 and j0.3, respectively per-unit values are based on the machine ratings. A solid ground fault occurs at one phase of the far end of the transmission line. calculate the fault current. **[9]**

Q7) a) What are the advantages of HVDC transmission line. **[6]**

b) Write a short note "chandrapur-padghe HVDC line" **[5]**

c) Write a short note " Monopolar HVDC station" **[5]**

OR

Q8) a) Explain "Constant current control" in HVDC line. **[6]**

b) Write the functions of the following components in HVDC system: **[5]**

i) Smoothing reactor.

ii) Converter transformer.

b) Write a short note " Back to Back HVDC station" **[5]**