[5153]- 566

T.E. (Electrical)
POWER SYSTEM - II
(2012 Pattern) (Semester - II) (End Sem.)

Time :2½ Hours]   *[Max. Marks :70*

Instructions to the candidates:

1)   Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10.
2)   Neat diagrams must be drawn wherever necessary.
3)   Figures to the right side indicate full marks.
4)   Assume suitable data if necessary.

Q1) a)   Explain surge impedance loading and methods to improve it.   **[4]**

b)   Compare HVDC system with HVAC system.   **[6]**

OR

Q2) a)   Explain the concept of complex power.   **[5]**

b)   A 132 kV line with 2 cm diameter conductors is built so that corona takes place if the line voltage exceeds 210 kV(rms). If the value of potential gradient at which ionization occurs can be taken as 30 KV/cm. Find spacing between conductors.   **[5]**

Q3) a)   A three phase 132 kV overhead line delivers a load of 50 MVA at 132 KV and 0.8 p.f. lagging at its receiving end. The constants of the transmission line are: A=D=0.98∠3º, B=110∠75ºΩ/ph, Determine:
   i)   Sending end voltage and power angle.

   ii)   Sending end active and reactive power.   **[6]**

b)   Write short note on   **[4]**

   i)   Back to Back HVDC system.

   ii)   Two terminal HVDC system.

OR

P.T.O.

Q4) a) Explain the concept of disruption critical voltage. **[6]**

b) State the factors and conditions affecting the corona. **[4]**

Q5) a) Define per unit system. Prove that the per unit impedance applied to three phase system and single phase system is same. **[8]**

b) Give in detail classification of bus for load flow analysis. Also explain the necessity of slack bus. **[8]**

OR

Q6) a) Explain with flow chart Gauss Seidel method of load flow analysis. **[8]**

b) Form Y bus for the 4 bus system if the line series impedances are as under **[8]**

Line (bus to bus)	Impedances
1-2	0.025+j0.1 pu
2-3	0.02+j0.08 pu
3-4	0.05+j0.20 pu
1-4	0.04+j0.16 pu

Neglect the shunt capacitance of the line

Q7) a) Write a short note on current limiting reactor. **[8]**

b) Explain the procedure of selection of circuit breaker. **[8]**

OR

Q8) a) Explain in detail the sub-transient, transient and steady states of unloaded alternator under symmetrical fault condition. **[8]**

b) What do you mean by dc Offset current? What is the effect of the instant of short circuit on the waveform of short circuit short current (consists of dc Offset) R-L circuit. **[8]**

Q9) a) Derive the expression for fault current in case of L-G fault through a fault impedance of Z_f in terms of sequence. Draw the sequence network for this type of fault. **[9]**

b) Show that power in three phase circuit can be computed from symmetrical components of voltages and currents. **[9]**

OR

*Q10)*a) A 50 MVA, 11kV,3 phase synchronous generator was subjected to different types of faults. The fault currents are as follows, **[9]**

LG fault - 4130 amp

LL fault - 2590 amp

LLL fault - 1870 amp

The generator neutral is solidly grounded. Find per unit values of 3 sequence reactance's of generator.

b) Explain sequence network of synchronous machines. **[9]**

ళళళళ