Vision Institute Of Technology

PSA Assignments

Unit-I

1. Discuss the various stragic location aspects of reactors of limiting the fault current and their advantages.
2. A 200 MVA, 11 KV, 3-phase generator has a sub-transient reactance of 10%.The generator supplies a number of synchronous motors over a 34 KM transmission line having transformers at both end in one line diagram. The motors all rated 12.2 KV, represented by just two equivalent motors. Rated inputs to the motors are 300 MVA and 200 MVA for M_1 and M_2 respectively. For both motors X_{II} = 30%. The three phase transformers T_1 is rated 350 MVA, 220(delta)/11(star grounded) KV with leakage reactance of 10%. Transformer T_2 is composed of three single phase transformers each rated 127(star grounded)/12.2(delta) KV, 300 MVA with leakage reactance of 10%. Series reactance of transmission line is 0.2 Ω/KM. Draw the reactance diagram with all reactance's marked in per unit. Select the generator rating as base in generator circuit. (2019
3. Draw the zero sequence network of delta-delta connection.
   Discuss the representation of a power system network by reactance diagram show that the per unit impedance of a transformer computed from primary or secondary side is same if the voltage base on two sides are in the ratio of transformation.
4. What do you understand by instantaneous maximum momentary current for line? Explain it with the help of suitable diagram and drive condition of doubling effect.
5. Prove that the equivalent PU reactance of transformer remains the same on either side of the transformer

Unit-II

1. Define the symmetrical components. Discuss the principle of the symmetrical components. Derive the necessary equation to convert phase quantities into symmetrical components

2. The line to ground voltages on the high voltage side of a step up transformer are 100 KV, 33 KV and 38 KV on phases a, b and c respectively. The voltage of phase a leads that of phase b by 1000 and lags that of phase c by 176.50. Determine analytically the symmetrical components of voltage.
3. Derive the expression for the symmetrical components of fault current of a power system for L-L fault through impedance. A 30 MVA, 11 KV generator has Z1=Z2= j0.2 pu, Z0=j0.05 pu. A-line to ground fault occurs on the generator terminals. Find the fault current and line to line.
4. What do you understand by instantaneous maximum momentary current for line? Explain it with the help of suitable diagram and drive condition of doubling effect.
5. For a single line to ground fault at the terminals of an unloaded generator, positive sequence current was found to be 50 A. Determine sequence currents in phase b and

Unit-III

1. Discuss the fast decoupled load flow method in load flow study.
2. What is the necessity of load flow study in a power system? What is Newton-Raphson method? How it is applied for the solution of power flow equation? Explain with the help of an example.
3. State Gauss-Seidel load flow formula
4. Mention the quantites specified and not specified at the reference bus defined for load flow study.
5. A 25 MVA, 13.2 KV alternator with solidty groundod,
6. neutral has a subtransient reactance of 0.25. The negative and zero - sequence reactances are 0.35 and 0. I pu. respectivelly. Determine the fault current and line to line voltages at the fault point when a double line to ground fault occurs at the terminals of the ahernator. Deduce also the expression used for calculating fault current.