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| **S NO** | **QUESTION** | **Knowledge****Level** | **CO** |
| **UNIT I** |
| 1 | a)Explain the advantages of per unit computations | K2 | CO-1 |
| b)Interpret Ybus for the network by direct inspection method

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Element | 5-1 | 5-2 | 1-2 | 2-3 | 1-4 | 3-6 | 4-6 |
| Positive sequence reactance | 0.04 | 0.05 | 0.04 | 0.03 | 0.02 | 0.07 | 0.10 |

 | K3 | CO-1 |
| 2 | a)If the reactance is 15ohms,interpret the p.u value for a base of 15KVA and 10Kv. | K2 | CO-1 |
| b) Show that the per unit equivalent impedance of a two winding transformer is the same whether the calculations is made from H.V. side or the L.V. side. | K3 | CO-1 |
| 3 | a) Define p.u value.Write the equation for converting the per unit impedance expressed in one base to another?  | K1 | CO-1 |
| b) A120MVA, 19.5 Kv generator has a synchronous reactance of 0.15p.u and it is connected to a transmission line through a transformer rated 150MVA, 230/18Kv (Y/∆) with X=0.1 p.u.calculate and analyze the p.u reactances for a base value of 100MVA and 220Kv on HT side of transformer.  | K3 | CO-1 |
| **UNIT 2** |
| 1 | a) Describe a Bus in power system. State the quantities specified and the quantities to be determined from load flow study for various types of buses. What are the iterative methods mainly used for the solution of load flow problems? | K2 | CO-2 |
| b) Construct load flow equations using YBUS matrix. Obtain load flow equation for Gauss Siedel method. | K3 | CO-2 |
| 2 | a)Describe the steps to be followed for load flow study of a power system | K2 | CO-2 |
| b) Explain the procedure for load flow solution by Gauss-Seidel method. | K3 | CO-2 |
| 3 | a)Explain the need for load flow study | K2 | CO-2 |
| b) Illustrate the step by step computational procedure for the Gauss-Seidel method of load flow studies | K3 | CO-2 |
| **UNIT 3** |
| 1 | a)Describe the modification of an existing bus impedance matrix1. While adding a branch of impedance Zb from a new bus-p to the reference bus.
2. while adding a branch of impedance Zb from a new bus-p to an existing bus q.
 | K2 | CO3 |
| b) Construct bus impedance matrix for the following network using step by step ZBUS building method.ZBUS2 | K3 | CO-3 |
| 2 | a) Summarize the possible ways of adding additional branch impedance Zb to an existing ZBUS. | K2 | CO-3 |
| b) Construct the bus impedance matrix for the system using bulding algorithm whose reactance diagram is shown in figure. All the impedances are in p.uZBUS | K3 | CO-3 |
| 3 | Describe the need of Zbus building algorithm | K2 | CO-3 |
| **UNIT 4** |
| 1 | Explain the advantages of symmetrical components? | K2 | CO-3 |
| 2 | A power plant has two generators of 30 MVA. 15% reactance each and two 10 MVA generators of 10% reactance paralleled at a common bus bar from which load is taken through a number of 4 MVA step up transformers each having a reactance of 5%. Determine the short circuit capacity of the breakers on the: (i) low voltage, and (ii) high voltage side of the transformer.  | K3 | CO-3 |
| 3 | Describe the sequence networks of three phase transformer and draw its sequence networks. | K1 | CO-3 |
| **UNIT 5** |
| 1 | Classify the different types of unsymmetrical faults that can be occurring on a 3-phase system. | K4 | CO-4 |
| 2 | A 25 MVA, 13.2 KV alternators with solidly grounded neutral has a sub transient reactance of 0.25 p.u. The negative and zero sequence reactance are 0.35 and 0.01 p.u. respectively. If a double line-to-ground fault occurs at the alternator. Determine the fault current and line-to-line voltages at the fault. | K3 | CO-4 |
| 3 | A 3-phase, 10MVA, 11KV alternator has 10% subtransient reactance. Calculate short circuited MVA and current. If symmetrical fault occurs at its terminals. | K3 | CO3 |
| **UNIT 6** |
| 1 | Distinguish between steady state, transient and dynamic Stability. | K4 | CO-4 |
| 2 | Summarize the methods of improving power system stability. | K5 | CO-4 |
| 3 | A two pole, three phase, 50 MVA, 11 kV generator is supplying rated power at 0.8 lagging power factor to an 11 kV bus. Due to a fault the generator output is reduced to 30%. The KE stored in the moving parts of the generator is 120 MJ. Determine (i) acceleration power and (ii) acceleration at the time of fault. | K3 | CO-4 |