1T00835 - T.E.(Electiral Engineering)(SEM-V)(Choice Base Credit Grading System ) (R- 19) (C Scheme) / 32022 - Electric Power Systems II QP CODE: 10030915 DATE: 25/05/2023

**Duration – 3 Hours** **Total Marks assigned to the paper- 80**

**N.B.: - (1) Question No.1 is compulsory.**
**(2) Attempt any Three questions out of the remaining five questions.**
**(3) Assume suitable data if necessary and justify the same.**

Q 1. **Answer all questions**.

A) Explain the terms short circuit MVA and symmetrical fault. **05**

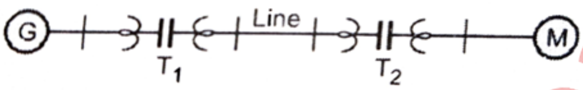
B) Discuss the role of bundled conductors in corona. **05**

C) Differentiate between symmetrical and unsymmetrical faults. **05**

D) Explain various rules used in the formation of sequence networks of power systems.

Q 2 a) Illustrate the short circuit of synchronous machine at no load condition. **10**

Q 2 b) A synchronous generator and synchronous motor each rated at 25 MVA and 11kV having 15% subtransient reactance are connected through transformer and line as shown. The transformer is rated for 25 MVA,11/66kV and 66/11kV with leakage reactance of 10%.The line has reactance of 10% on the base of 25MVA and 66 KV. The motor is drawing 15MW at 0.8 pf leading and terminal voltage is 10.6 kV. When a symmetrical three phase fault occurs at the terminal of motor. Determine the subtransient current in generator, motor and fault. **10**




Q 3 a) Discuss the phase shift of symmetrical components in star delta transformer. **10**

Q 3 b) Derive the equation for fault current and sequence network for double line to ground fault. State the various assumptions in calculation. **10**

Q 4 a) A 25 MVA,13.2 kV alternator with solidly grounded neutral has subtransient reactance of 0.25 pu. The negative and zero sequence reactances are 0.35 and 0.1 pu respectively. A single line to ground fault occurs at the terminals of an unloaded alternator. Determine the fault current and line to line voltages.(Neglect resistance) **10**

Q 4 b) Describe the generation of voltage and current travelling waves on a open circuited line with figure and equations. **10**

Q 5 a) Calculate an arrestor's voltage and current rating if it is placed at the end of a line and at the junction of two lines. Draw the equivalent circuit for the same. **10**

Q 5 b) Discuss the generation and formation of corona rings and corona pulses in EHV lines. **10**

Q 6 a) Describe the algorithm for short circuit studies. **10**

Q 6 b) Explain the following (i) Fortescue theorem (ii) volt time curves **10**

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