Duration – 3 Hours **Total Marks - 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) Differentiate between Symmetrical and Unsymmetrical faults. **05**

B) State factors affecting the formation of corona. **05**

C) What is the significance of tower footing resistance in power system? **05**

D) Why insulation coordination is required? **05**

Q 2 a) A 25 MVA 13.2 KV alternator with solidly grounded neutral has sub transient reactance of 0.25 PU. The negative and zero sequence reluctances 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 2 b) Derive Fortescue theorem for Symmetrical fault analysis. **10**

Q 3 a) Find Critical disruptive voltage, and Critical voltage for local and general corona on three phase overhead transmission line consisting of three stranded copper conductors spaced 2.5m apart at the corners of an equilateral triangle. Air temperature and pressure are 21 Degree centigrade and 73.6 cm of mercury respectively. The conductor diameter is 10.4mm. Surface factor is 0.85. Surface irregularity factors for local and general corona are 0.7 and 0.8 respectively **10**

Q 3 b) Explain Surge Arresters and its type briefly **10**

Q 4 a) Discuss the operation of synchronous machine at load condition with waveform equation and equivalent circuit diagram. **10**

Q 4 b) Derive the equation for fault current for Double line to ground Fault. State the various assumptions. Draw the sequence network for same **10**

Q 5 a) Discuss the phenomenon of transient generation due to capacitance switching. **10**

Q 5 b) Write an algorithm for short circuit studies **10**

Q 6 a) Explain Lightning Phenomenon in step by step manner. **10**

Q 6 b) Discuss the generation and formation of corona ting and corona pulses in EHV Lines **10**

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