

Power System Analysis

QP Code : 5007

(3 Hours)

[Total Marks : 80

- N. B. : (1) Question No 1 is compulsory.
(2) Solve any **three** questions out of remaining.
(3) Assume the suitable data if required and specify the same.

1. Answer the following questions :- 20
 - (a) Explain the terms Short circuit MVA and Symmetrical fault.
 - (b) Explain the term surge impedance loading and natural loading of lines.
 - (c) What are the advantages of corona?
 - (d) Discuss the role of ground wire and tower footing resistance.

2. (a) Derive the equation for fault current and develop the sequence network for LLG fault on an unloaded synchronous generator. 10
(b) The line current in amperes in phases a, b, c respectively are $(500+j150)$, $(100-j600)$ and $(-300+j600)$. Determine the symmetrical components of current. 10

3. (a) Explain the terms protective characteristics, dynamic voltage rise and rating in case of lightning arrester. 10
(b) A wave of 11KV travels along the three phase transmission line of inductance 9.78×10^{-7} Henry and capacitance of 1.136×10^{-11} Farad and is terminated by a star connected load of 1000 ohms per phase. Calculate the line current, voltage across the terminating resistance, rate of power absorption, reflected voltage, rate of reflected energy and value of terminating resistance for no reflection. 10

4. (a) Discuss the short circuit of synchronous machine under no load condition 10
(b) Discuss the Z bus formation technique. 10

5. (a) Discuss the effect of length and load power on reactive power requirement of a line. 10
(b) Discuss the positive, Negative and Zero sequence network of a synchronous machine 10

6. (a) Discuss the role of Surge Capacitor, surge reactor and surge absorber. 10
(b) Explain the terms Critical Voltage, Visual Critical Voltage and Corona Ring. 10