Duration 3hrs **Total Marks -80**

N.B.:- (1) Question No.**1** is compulsory.
(2) **Attempt** any **three** questions out of remaining **five** questions.
(3) Draw neat diagrams wherever it is necessary.

Q 1. Answer the following questions.

A) Write a short note on phase shift in star-delta transformers. **05**

B) Discuss the phenomenon of corona. **05**

C) Explain the following typical cases of line specifications; **05**
1) Open circuited line.
2) Short circuited line.

D) What is tower footing resistance? **05**

Q 2 a) Explain in brief Selection of circuit breakers and short circuit MVA. **10**

Q 2 b) Discuss Z_{BUS} building algorithm. **10**

Q 3 a) Derive the necessary equation to determine the fault current for a line-to-line fault. Draw the diagram showing the inter-connection of sequence networks. **10**

Q 3 b) Explain the zero sequence impedance networks of transformer. **10**

Q 4 a) Discuss the phenomenon of wave reflection and refraction. Derive expressions for reflection and refraction coefficients. **10**

Q 4 b) How can Bewely Lattice be drawn? Discuss its use. **10**

Q 5 a) Define disruptive critical voltage and visual critical voltage. On what factors do they depend? Derive the equations for calculating these voltages. **10**

Q 5 b) Discuss the use of ; **10**
a) Ground wires.
b) Surge arrestors.

Q 6 a) Explain surge impedance loading. Also Explain the effect of line length, load power and power factor on voltage and reactive power. **10**

Q6 b) Discuss the maximum power transfer and stability considerations in transmission line. **10**

****