

(Time: 3 Hours)

[Total Marks: 80]

- Note**
- (1) Question No.1 is compulsory
 - (2) Attempt any three from the remaining
 - (3) Assume suitable data if necessary

- 1 Attempt any **four** questions. 20
 - (a) What is transposition of lines and why it is used?
 - (b) State factors affecting resistance of the transmission conductor
 - (c) What is per unit system?
 - (d) Explain Voltage regulation and Efficiency of transmission line.
 - (e) Name the conductor is used in transmission line and justify it's selection
- 2 (a) Derive expression of impedance in per unit for change of base ($Z_{p.u.new}$). 10
 - (b) A 3 phase 50 Hz, 150 km long transmission line has the following constants : Inductance /phase /km = 1.2 mH, Resistance/phase/km = 0.15 Ω , Capacitance /phase/km = 0.0096 μ f. The line supplies a load of 50 Mw at 0.8p.f. lagging as a line voltage of 132 kV at the receiving end. Using nominal π method, determine Sending end line voltage, Sending end line current, Sending end power factor, % regulation and % efficiency 10
- 3 (a) Derive the expression for inductance in single phase two wire conductor. 10
 - (b) Elaborate Ferranti effect in transmission line. 10
- 4 (a) Draw a schematic diagram of cable which shows all insulating layers used on it. State the use of each layer. 10
 - (b) Elaborate skin effect and proximity effect in detail. 10
- 5 (a) Derive the expression for the capacitance of a single phase line. 10
 - (b) Explain touch and step potential in detail. 10
- 6 (a) State all methods of neutral earthing and explain them in brief. 10
 - (b) Derive the A, B, C, D constants for the medium transmission line represented by nominal T-section. 10
