Electrical Transmission System **Sessional Assignment**
Total Marks=20

Question No 1: A 3-phase, 50-Hz overhead transmission line 100 km long has the following constants:

Resistance/km/phase = 0.1 Ω

Inductive reactance/km/phase = 0·2 Ω

Capacitive Susceptance/km/phase = $0{\cdot}04 \times 10^{-4}$ siemen

Determine (i) the sending end current (ii) sending end voltage (iii) sending end power factor and (iv) transmission efficiency when supplying a balanced load of 10,000 kW at 66 kV, p.f. 0·8 lagging. Use nominal T method.

Question No 2: A (medium) single phase transmission line 100 km long has the following constants:

Resistance/km = 0·25 Ω ; Reactance/km = 0·8 Ω

Susceptance/km = 14 × 10−6 siemen; Receiving end line voltage = 66,000 V

Assuming that the total capacitance of the line is localised at the receiving end alone, determine

(i) The sending end current (ii) The sending end voltage (iii) Regulation and (iv) supply power factor. The line is delivering 15,000 kW at 0.8 power factor lagging. Draw the phasor diagram to illustrate your calculations.

Question No 3: Describe Ferranti Effect, Why Ferranti effect occurs? Detail explanation of the Ferranti effect by considering a nominal pi (π) model. How to reduce Ferranti effect.