1- **A 3-phase single circuit transmission line is 400 km long. If the line is rated for 220 kV and has the parameters, R = 0.1 ohms/km, L = 1.26 mH/km, C = 0.009 µF/km, and G = O, find**

(a) The surge impedance and

(b) The velocity of propagation neglecting the resistance of the line.

(c) If a surge of 150 kV and infinitely long tail strikes at one end of the line, what is the time taken for the surge to travel to the other end of the line?

2- **A transmission line of surge impedance 500 ohm is connected to a cable of surge impedance 60 ohm at the other end. If a surge of 500 kV travels along the line to the junction point, find the voltage build-up at the junction?**

3- **An infinite rectangular wave on a line having a surge impedance of 500 ohm strikes a transmission line terminated with a capacitance of 0.004 µF. Calculate the extent to which the wave front is retarded?**

4- **An underground cable of inductance 0.189 mH/km and of capacitance 0.3 µF/km is connected to an overhead line having an inductance of 1.26 mH/km and capacitance of 0.009 µF/km. Calculate the transmitted and reflected voltage and current waves at the junction, if a surge of 200 kV travels to the junction,**

(a) Along the cable, and

(b) Along the overhead line.