MINOR – I Examination

ELL – 303 (Power System)

Time : 1 Hour **Full Marks : 20**

1. (a) The Partridge conductor has Al./St. of 26/ 7 ? What is the type of conductor? What is the representation 26 / 7? [1]
   (b) Write two advantages of the use of bundled conductors for EHV Transmission line with justification. [1]
   (c) A short line is used to feed a load at 11 kV. At no load condition the voltage at the load end is 11.5 kV. What will be voltage at the sending end? [1]
   (d) What is effect of ground while calculating the Capacitance (C_n) of an EHV transmission line? [1]
   (e) For the same system voltage, compare the SIL of an OH line to that of an underground cable with justification [1]
   (f) Mention a valid reason of transposition of long transmission lines. [1]

2. (a) Find the GMR of a 7-strand AAC, where the radius of each wire is "r". [2]
   (b) Calculate the inductance per meter length of a 50 Hz, three phase transmission line, where the conductors are placed 2.7 meter apart in a flat horizontal spacing. Each conductor consists of 7 strands of aluminum conductor of 3mm diameter. [2]

3. (a) A 400 kV long transmission line delivers a load of (2000 + j 1000) MVA at 400 kV. The series and shunt line parameters per unit length are (0.0201 + j 0.535) Ω and (j 7.75×10^{-6}) S respectively. Find the voltage at the sending end and at the middle of the line, if the line is 300 km long. [4]
   (b) Find the SIL of the line . [1]

4. (a) Derive the expression for the equivalent PI representation of a long transmission line. [2]

   (b) A 69-kV, three-phase short transmission line is 16 km long. The line has a per phase series impedance of 0.125 + *j*0.4375 ohm per km. Determine the sending end voltage, voltage regulation, the sending end power, and the transmission efficiency when the line delivers 70 MVA, 0.8 lagging power factor at 64 kV. [3]

0.4×10^{6} Z

Z_c