**Assignment No. 2**

1. (a) Find the expression for inductance of a two-wire single phase transmission line.

(b) Determine the inductance of a three phase line operating at 50Hz and conductors are arranged as follows. The conductor diameter is 1cm.



2. Determine the inductance/phase/km of a double circuit 3-phase line. The radius of each conductor is 20mm and the conductors are placed on the circumference of an imaginary circle at a distance of 7m forming a regular hexagonal figure.

3. (a) Derive the expression for the inductance of a three phase double circuit flat vertical spacing configuration.

(b) Determine the inductance of a single phase transmission line consisting of three conductors of 2.5mm radii in the GO conductors and two conductors of 5mm radii in the RETURN conductors. The configuration of the line is as shown in figure below.



4. (a) Derive the expression for flux linkages of one conductor in a group of n-conductors.

(b) Determine the inductance per km per phase of a single circuit 20kVline of given configuration as shown in fig. The conductors are transposed and have a diameter of 4.5cm.



5. (a) Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are symmetrically placed.

(b) Calculate the inductance per phase of a three –phase transmission line as shown in following fig. The radius of the conductor is 0.5cm. The lines are un-transposed.



6. (a) What is the bundling of the conductor?

(b) What is transposition of conductors? And why transposition of line conductors are needed?