Assignment Questions

**Module I**

1. Derive expression for internal flux linkages and explain how it is independent of size of the conductor
2. What is mean by skin effect what are the factors it depends and explain the effect of skin effect
3. Three conductors of a 3-phase transmission line are arranged in horizontal plane and are 4m apart. The diameter of each conductor is 2.5cm. Find inductance per km of each conductor (line-to-neutral). Assume balanced load and RYB sequence. Find average inductance per phase for regularly transposed line.
4. Explain the concept of self GMD and mutual GMD for evaluating inductance of transmission lines.
5. Calculate the inductance of a single phase two wire system, if the distance between conductors is 2m and radius of each conductor is 1.2cm
6. Derive the expression for inductance for three phase system for symmetrical and unsymmetrical configuaration

**Module II**

1. Derive an expression for capacitance of a single phase two wire overhead transmission line.
2. Six conductors of a double circuit transmission line are arranged as shown in fig.1. Conductor diameter is 25mm. Find charging current per km per conductor at 132KV ,50Hz assuming regularly transposed. Neglect effect of earth. 6 Fig.1 OR 4. a) Derive the expression for a capacitance of 3 phase

Fig1

1. Derive the expression for a capacitance of 3 phase overhead transmission line with symmetrical spacing.
2. Determine capacitance per km per phase to neutral of a 3 phase line as shown in fig.2. The outer diameter of conductor is 2.8cm. The line is transposed. Take effect of earth into account.

 Fig2

1. Derive the expression for a capacitance of 3 phase overhead transmission line with unsymmetrical spacing.

**Module III**

1. Give the classification of transmission lines. Explain influence of power factor on the performance of transmission line.
2. A 3-phase overhead line delivers 4200KW at 0.8pf lagging to a load. If the sending end voltage is 33KV and impedance of each conductor is (4.5+j5.6)Ω, find i) Receiving end voltage ii) line current iii) transmission efficiency
3. What is meant by corona? What are the factors the influence corona?
4. A 3-phase 50Hz 150Km long transmission line has R=0.15 Ω/ph/Km, L=1.2mH/ph/Km and C=0.0096µF/ph/Km. The line delivers 30MW load at
5. 0.9pf lagging at 132KV on receiving end. Using nominal-π method, determine sending end voltage, sending end current, sending end power factor.
6. Draw and derive the expression for the equivalent circuits of a long transmission line

**Module –IV**

1. How conductor sag is calculated when supports are at unequal levels?
2. Following data refers to a transmission line. Length of span =250m, effective diameter of conductor =1.88cm, weight of conductor=0.87kg/m run. Ultimate strength =8100kg, radial thickness of ice=1.2cm, wind pressure=38kg/m2 of projected area, factor of safety=2, density of ice=913kg/m3 . Calculate sag.
3. Discuss the classification of insulators. Give their application areas.
4. For a string insulator with 4 discs, the capacitance of the disc is 10 times the capacitance between pin and earth. Calculate the voltage across each disc when used on a 66KV and string efficiency.
5. Explain briefly the following methods of grading of cables: a) Capacitance grading b) Intersheath grading
6. How do you calculate the sag of a conductor? Write briefly the factors which effect sag?
7. Derive the expression for sag and tension when the support are at unequal heights

**Module V**

1. Write short note on various systems of d.c. distribution
2. How does A.C distribution differ from D.C distribution?
3. Compare overhead lines with underground cables.
4. A 6.5km long cable has a conductor diameter of 15mm and internal sheath diameter of 30mm. Find the conductor resistance and insulation resistance of each piece if the cable is cut into two equal pieces. Specific resistance of conductor is 0.017µΩ-m. Specific resistance of insulation material is 6MΩ/m.
5. Compare weight of conductor material requirement of 3-phase 3 wire system with Dc 2 wire system.
6. A single core cable is used on 33KV,50Hz has conductor diameter of 10mm and inner diameter of sheath of 25mm. relative permittivity of material is 3.5, calculate. i) Capacitance of cable per km. ii) Maximum and minimum values of stress iii) charging current per km.