

Registration No :

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Total Number of Pages : 02

B.Tech
PEE4I104

4th Semester Regular / Back Examination 2018-19
ELECTRICAL POWER TRANSMISSION & DISTRIBUTION
BRANCH : ELECTRICAL

Max Marks : 100

Time : 3 Hours

Q.CODE : F683

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10)

(2 x 10)

- a) What is per unit system?
- b) Resistance in AC is more than DC Justify.
- c) Why the transmission line is transposed?
- d) What is stringing chart?
- e) Draw the Phasor diagram for nominal- π network of medium transmission line.
- f) How to reduce the conductor vibration?
- g) What is Proximity effect?
- h) State the factors affecting sag?
- i) What are the types of poles used in transmission and distribution system?
- j) What factors decide the rise in temperature in underground cable?

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)

(6 x 8)

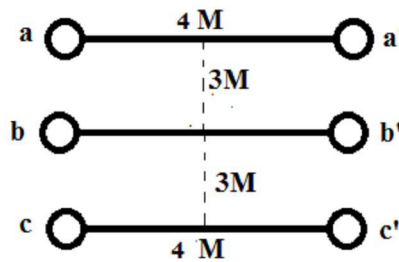
- a) Derive the expression for capacitance of a 3-phase overhead line with unsymmetrical spacing.
- b) Derive the power flow through transmission line.
- c) Discuss the testing of insulators?
- d) Explain voltage regulation of transmission line? Deduce an expression for voltage regulation of a short transmission line.
- e) What is string efficiency? Explain the methods of improving string efficiency.
- f) Explain reactive compensations of a Transmission line?
- g) State and explain kelvin's law. Illustrate the limitations.
- h) Calculate the string efficiency and voltage of the conductor of a 3-phase transmission line is being supported by three disc insulators. The Potential across top unit (i.e., near to the tower) and middle unit are 8 kV and 11 kV respectively.
- i) Compare various distribution systems.
- j) Classify three phase underground cables? Discuss various methods of grading of cables.
- k) Distinguish touch and step potential and explain the use of grounding.
- l) The insulation resistance of a single-core cable is 495 M Ω per km. If the core diameter is 2.5 cm and resistivity of insulation is 4.5×10^{14} Ω -cm, find the insulation thickness.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Classify overhead transmission line according to its performance and derive the A,B,C,D constant of long transmission line. **(16)**

Q4 Find the expression for flux linkages due to a single current carrying conductor and evaluate the inductance per phase per km of a double circuit 3 phase line as shown in the fig. The conductors are transposed and are of radius 0.75 cm each. Where a,b& c are go conductor and corresponding a',b' and c' are return conductor for corresponding a,b and c Phase. **(16)**



Q5 Describe the different types of D.C distributors. A 2-wire D.C distributor AB is fed from both ends. At the feeding point A the voltage is maintained at 240 V and at B is 245 V. The total length of the distributor is 200 meters and loads are tapped off as under: 25A at 50 meters from A; 50A at 75 meters from A; 30A at 100 meters from A and 40A at 150 meters from A. If the resistance per Km of one conductor is 0.3Ω , calculate:
 i) The currents in the various sections of the distributor
 ii) The minimum voltage and the point at which it occurs.
 iii) The power dissipated in the distributor **(16)**



Q6 Derive the equation of sag when supports are at equal levels and discuss the effect of ice loading and wind pressure on sag. **(16)**