

B. Tech. (Sem. - 5th)**POWER SYSTEM - I (Trans. & Distribution)****SUBJECT CODE : EE - 305****Paper ID : [A0415]****[Note : Please fill subject code and paper ID on OMR]****Time : 03 Hours****Maximum Marks : 60****Instruction to Candidates:**

- 1) Section - A is **Compulsory**.
- 2) Attempt any **Four** questions from Section - B.
- 3) Attempt any **Two** questions from Section - C.

Section - A**Q1) (10 × 2 = 20)**

- a) Explain the difference in feeder and distributor.
- b) What are the advantages of high voltage transmission. Give the limitations also.
- c) What is ferranti effect.
- d) What is ACSR. Give advantages of it.
- e) What is string chart.
- f) Find out the capacitance of a single phase line 30 Km. long consisting of two parallel wires each 15 mm diameter and 1.5 m apart.
- g) What is surge impedance loading.
- h) What do you understand by the term grading of cables.
- i) What is effect of wind on sag of transmission line.
- j) What is arcing horn.

Section - B**(4 × 5 = 20)**

- Q2)** Compare the copper efficiency of single phase and three phase, three wire supply system assuming equal power loss in transmitting same power over given distance.

- Q3) (a) Each conductor of a 3 phase overhead transmission line is suspended from a cross arm of a steel tower by a string of four suspension insulators. The voltage across second unit is 15.0 kV and across the 3rd is 27.0 kV. Find the voltage between conductors and string efficiency.
- (b) A three phase transmission line. 100km long has following constants resistance per km per phase 0.28 ohm; inductive reactance per km per phase 0.63 ohm; Capacitive susceptance per km per phase 4×10^{-6} siemens. If the load at the receiving end is 75 MVA at 0.8 lagging with 132 kV between lines Calculate sending end voltage. current and p.f. use nominal pie method.
- Q4) Derive the expression for the capacitance of three phase unsymmetrical spaced transposed overhead transmission line.
- Q5) What are A, B, C and D constants of long transmission line and derive these constants for nominal T and II network of long transmission line.
- Q6) Explain direct laying method of laying of underground cables.

Section - C

(2 × 10 = 20)

- Q7) The generalized constants of one phase of a three phase line are $A = D = 0.9 + j 0.012$, $B = (22.5 + j 1500)$ ohm and $C = (-0.00004 + j 0.001)$ S The sending end voltage is 240 V and the receiving end voltage is 220V line to line. Draw the circle diagram and determine the active and reactive power received when the angle between the sending end and the receiving end voltage phasors is 30°.
- Q8) (a) Explain the influence of capacitance on performance of loaded line.
(b) Explain the effect load power factor on the transmission efficiency and voltage regulation of transmission line.
- Q9) (a) Explain Intersheath grading method used in cables.
(b) Derive an expression for sag of a line supported between two supports of the same height.

