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B.E./B.Tech (FULL TIME) END SEMESTER EXAMINATIONS, APRIL/ MAY 2019

ELECTRICAL AND ELECTRONICS ENGINEERING

SEMESTER IV (REGULATIONS - 2012)

EE 8406 – TRANSMISSION & DISTRIBUTION

Time: 3 Hours

Answer ALL Questions

Max Marks: 100

Part - A (10×2=20)

1. Mention the voltage levels of three phase four wire system
2. Write down the merits of ring main systems
3. Why are conductors stranded?
4. State the advantages of double circuit transmission
5. What is the range of surge impedance for over head line?
6. Draw the equivalent circuit of short transmission line
7. Name any two materials used in insulators
8. At what situation, Ferranti effect occurs in underground cable?
9. State the uses of stringing chart
10. What is meant by tower span?



Part - B (5×16=80)

11. (i) Prove that the voltage drop diagram for a uniformly loaded distributor fed at one end is parabola. (8)
(ii) A uniform two wire DC distributor 250 m long is loaded with 0.4A/m and is fed at one end. If the maximum voltage drop is not to exceed 10V, find the cross sectional area of the distributor conductor. Take $\rho=1.78 \times 10^{-8} \Omega\text{m}$ (8)
12. a (i) Derive an expression for flux linkage due to internal flux of an overhead line conductor having radius r , carrying current I . (8)
(ii) Find the inductance per phase per km of a three phase overhead transmission line using 2 cm diameter conductors when these are placed at the corners of an equilateral triangle of side 4 metres. (8)

(OR)

- b. (i) Derive an expression for capacitance of three phase line with equilateral spacing. (8)
(ii) Calculate the capacitance of a 100 km long, three phase, 50 Hz overhead transmission line consisting of three conductors, each of diameter 25 mm spaced 3.0 m at the corners of an equilateral triangle. (8)

13. a) Draw equivalent circuit of medium transmission line using II model. From this, derive expressions for transmission efficiency and voltage regulation. (16)

(OR)

- b) With appropriate diagram, derive an expression for power transmission capacity of three phase system. (16)

- 14.a) (i) Describe various methods to improve string efficiency of insulators. (8)

(ii) A insulator string for 66 kV line has 4 discs. The capacitance from each joint to tower is 25 % of the self capacitance of each unit. Find the voltage distribution across the units and string efficiency. (8)

(OR)

- b) (i) Derive the expression for electric stress in a single core cable. (8)

(ii) Find the most economical conductor diameter for single-core cables to be used on 33 kV, three phase system if the rms value of maximum stress is not exceed to 40kV/cm. Also find the radial thickness of insulation. (8)

- 15.a) Derive expressions for sag and tension in a power conductor strung between two supports at equal heights taking in to account the wind and ice loadings also. (16)

(OR)

- b) With suitable diagrams, describe any four methods of grounding. (16)

