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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Electrical & Electronics Engineering **Duration: 3 hrs.**
Course Code: 19EE5PCTND **Max Marks: 100**
Course: Transmission and Distribution **Date: 20.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1	a)	Draw the typical layout of transmission and distribution systems scheme with typical voltage levels.	**05**
	b)	Develop the necessary expression for the transmission line mounted between supports at equal heights takes the form of a catenary.	**07**
	c)	Derive and analyses the ways of enhancing string efficiency	**08**

OR

2	a)	Develop the necessary expression for the effect of HVAC transmission on: a). Increased efficiency b). Decreased line losses c).Reduced weight of conductor material.	**07**
	b)	Develop the necessary expression for the transmission line mounted between supports are at unequal levels.	**07**
	c)	The three bus-bar conductors in an outdoor substation are supported by elements of post type insulators. Each element consists of a stack of 3 pin type insulators linked one on the top of the other. The voltage across the lowest insulator is 13.1 kV and that across the next element is 11 kV. Find the bus-bar voltage of the station.	**06**

UNIT - II

3	a)	Draw the cross-section of a one single core cable with the help of neat sketch and also an expression for power factor & power losses in the dielectric of a single core cable**.(05+05=10M)**	**10**
	b)	What are methods for process of achieving uniform electrostatic stress(grading of cable) in the dielectric of cable	**10**

UNIT - III

4	a)	Develop an expression for calculating the internal and external flux linkages for a conductor carrying current. Use these expression to derive the equation for inductance of single phase overhead transmission line.	**10**

b) Develop an expression for capacitance of three phase overhead line with unsymmetrical spaced line. **10**

UNIT - IV

5 a) Analyses and develop an expression for ABCD constants of medium transmission line using Nominal- Pai(π) method. Also draw the phasor diagram. **10**

b) A three phase ,50 Hz overhead transmission line,100KM long delivers 20MW at 0.9 power factor lagging & at 110KV. The Resistance& reactance of the line per phase per KM are 0.2 Ω & 0.4Ω respectively, while capacitive admittance =$2.5x10^{-6}$ ℧/KM (mho/KM). Evaluate (i). Voltage, &Current at sending end, and (ii).Efficiency of transmission for this load using nominal T-method. **10**

UNIT - V

6 a) Derive the expression for DC Distributor Fed at one End—Concentrated Loading. **06**

b) A two conductor street main 'AB', 500 meters in length is fed from both ends at 250 V. Loads of 50A,60A,40A &30A are tapped at distance of 100m, 250m, 350m & 400m from 'A' respectively. If the cross-section of the conductor be $1cm^2$ and specific resistivity of the martial of conductor is 1.7 micro ohm-cm. Evaluate the minimum consumer voltage. **08**

c) Derive the expression for A.C distributors with concentrated loads of referring power factor : Power Factors referred to respective load voltages **06**

OR

7 a) Explain with neat diagram for DC distribution systems of according to scheme of connection. **06**

b) A DC two-line Distributor 'AB, is fed at both ends at same voltage of 220V & 225V respectively. the length of distributor is 225m and loads tapped off from the end F_1 are: **08**

Distance in meter	50	75	100	125
Load in amps	20	40	25	35

The resistance per kilometer of both distributor is 0.3 ohm. Evaluate:

(i) The current in each section and

(ii) The voltage at the point of minimum potential.

c) Derive the expression for A.C distributors with concentrated loads of referring power factor : Power factors referred to receiving end voltage. **06**

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