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

Autonomous Institute Affiliated to VTU

August 2024 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Electrical and Electronics Engineering **Duration: 3 hrs.**
Course Code: 23EE4PCGTD **Max Marks: 100**
Course: Generation, Transmission and Distribution

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	**CO**	**PO**	**Marks**
1	a)		Define the following terms: i) Demand factor, ii) Load factor, iii) Diversity factor and iv) Load curve.	CO1	PO1	**04**
	b)		Draw the typical block schematic diagram for solar electric generating System and explain in brief.	CO1	PO1	**08**
	c)		Briefly explain any two methods of power factor improvement in electric power system.	CO1	PO1	**08**
			OR			
2	a)		Define sag? Give the advantages of high voltages for transmission.	CO1	PO1	**04**
	b)		Derive & analyze the equation for sag when the conductor is supported between two poles at the same level	CO1	PO1	**08**
	c)		A transmission line has a span of 275m between level supports. The conductor has an effective diameter of 1.96cm and weighs 0.865kg/m. Its ultimate strength is 8060kg. If the conductor has ice coating of radial thickness 1.27cm and is subjected to a wind pressure of 3.9gm/cm^2 of projected area, calculate sag for a safety factor of 2. Weight of 1c.c of ice is 0.91gm.	CO1	PO2	**08**
			UNIT - II			
3	a)		Explain any two methods used for improving string efficiency of an insulator.	CO2	PO1	**04**
	b)		A string of 4 insulators is connected across a 285kV line. The self-capacitance of each unit is equal to 5 times the pin to earth capacitance. Calculate the potential difference across each unit and the string efficiency.	CO2	PO2	**08**
	c)		The conductors of a three-phase 66kV, 50Hz, 100km long overhead line are transposed. The diameter of the conductor is 2.5cm. The conductors are placed such that $D_{31} = 5m$, $D_{12} = 2.5m$ and $D_{23} = 2.5m$. Determine, i) inductance per phase, ii) capacitance per phase and iii) charging current per phase.	CO2	PO2	**08**

			UNIT - III			
4	a)		Analyses and develop an expression for ABCD constants of medium transmission line using Nominal-T method. Also draw the phasor diagram.	*CO4*	*PO2*	**10**
	b)		A three phase, 50 Hz overhead transmission line, 150KM long delivers 25MW at 0.85 p.f lagging & at 110KV. The Resistance& reactance of the line per phase per KM are 0.3Ω(ohm)&0.9Ω(ohm) respectively, while capacitive admittance $=0.3 \times 10^{-6}$ $\mho$/KM (mho/KM). Evaluate (i).Voltage regulation & (ii)Efficiency of transmission for this load using nominal (Pi) method.	*CO4*	*PO2*	**10**
			UNIT - IV			
5	a)		Discuss on Factors Influencing Corona and Corona Benefits and Disadvantages	*CO2*	*PO1*	**06**
	b)		Define Grading of cables and Develop an expression for the ratio of gradient with & without inter sheath is $\frac{2}{1+\alpha}$, when there is only one layer with one inter sheath.	*CO2*	*PO1*	**08**
	c)		Single core lead covered cable is to be designed for 66Kv to earth. Its conductor radius 10mm and its three insulating martials have relative permittivity 5, 3 &4 respectively and the cross ponding man permissible stress of 3.5, 2.5, 1.8 KV/mm(rms value)respectively. Evaluate the minimum diameter of lead sheath.	*CO2*	*PO2*	**06**
			UNIT - V			
6	a)		Write a short note on, i) Radial distribution system and ii) Ring main distribution system.	*CO3*	*PO1*	**08**
	b)		A 2 wire DC distributor AB 200m long is fed from feeding point 'A' at 230V and 'B' at 235V. The following loads are tapped off as follows: 25A at 50m from A, 45A at 75m from A, 30A at 100m from B, 40A at 50m from B. The resistance of each conductor is 0.3Ω/km. Calculate the current in all the sections, minimum voltage and the point at which it occurs.	*CO3*	*PO2*	**12**
			OR			
7	a)		What are the different methods used for calculating AC distribution problems.	*CO3*	*PO1*	**04**
	b)		A DC two-line Distributor 'AB, is fed at both ends at voltage of 220V & 225V respectively. the length of distributor is 225m and loads tapped off from the end A are:	*CO3*	*PO2*	**10**

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) | | Differentiate between earthing and grounding. | *CO3* | *PO1* | **06** |

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