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

Autonomous Institute Affiliated to VTU

February 2025 Semester End Main Examinations

Programme: B.E.
Branch: Electrical and Electronics Engineering
Course Code: 23EE4PCGTD / 22EE4PCGTD
Course: Generation, Transmission and Distribution

Semester: IV
Duration: 3 hrs.
Max Marks: 100

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)		Draw the typical block schematic diagram for solar electric generating System and explain in brief.	CO1	PO1	**07**
	b)		Explain the following terms: Demand Factor; Load Factor; Diversity Factor.	CO1	PO1	**06**
	c)		Derive & analyses the equation for sag when the conductor is supported between two poles at the same level.	CO1	PO2	**07**
			OR			
2	a)		Draw the typical block schematic diagram for thermal power plant and explain in brief.	CO1	PO2	**07**
	b)		Derive & analyze the equation for sag when the conductor is supported between two poles at the same level	CO1	PO2	**06**
	c)		A transmission line uses a copper of wire 200 mm^2 with conductor configuration 54+7/2.24 mm. The span of the line 160 m with the supports are at same level. The man stress in the conductor is 41kg/mm^2 with F.S 5. Evaluate: **i).** Sag in still air; **ii).** Sag with wind load of 1.55 kg and ice coating of 1.25mm; **iii).** Vertical sag as in case (2). Assume current density as 8.9gm/cc	CO1	PO2	**07**
			UNIT - II			
3	a)		A string of 8 suspension insulator is to be fitted with a guard ring. If the pin to earth capacitances are all equal to C, derive the general expression for the line to pin capacitor in terms of n, c and p. where p is number of pins, so as to give uniform voltage distribution over the string. If there are 8 suspension insulators, using the expression derived, obtain the values of all line to pin capacitances.	CO2	PO2	**10**
	b)		Develop an expression for inductance (internal flux & external flux) of a single phase two wire system.	CO2	PO1	**10**
			OR			

	4	a)	Derive an expression for inductance of three phase line with unsymmetrical spacing but transposed.	*CO2*	*PO2*	**10**
		b)	Discuss on ways of enhancing string efficiency and explain in brief	*CO2*	*PO1*	**10**
			UNIT - III			
	5	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, 100 km long delivers 25 MW at 0.85 p.f lagging & at 110 kV. The resistance& reactance of the line per phase per km are 0.3 Ώ (ohm) & 0.9 Ώ (ohm) respectively, while capacitive admittance $=0.3 \times 10^{-6}$ ℧/km (mho/km). Evaluate (i) Voltage regulation & (ii) Efficiency of transmission for this load using nominal (Pi) method.	*CO4*	*PO2*	**10**
			OR			
	6	a)	Analyses and develop an expression for ABCD constants of medium transmission line using Nominal-pi method. Also draw the phasor diagram.	*CO4*	*PO2*	**10**
		b)	A three phase, 50 Hz overhead transmission line, 30 km long delivers 10 MW at 0.85 p.f lagging & at 11 kV. The resistance & reactance of the line per phase per km are 0.3 Ώ (ohm) & 0.9 Ώ (ohm) respectively, while capacitive admittance $=0.3 \times 10^{-6}$ ℧/km (mho/km). Evaluate (i) Voltage regulation & (ii) Efficiency of transmission line.	*CO4*	*PO2*	**10**
			UNIT - IV			
	7	a)	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*	**10**
		b)	Single core lead covered cable is to be designed for 66 kV to earth. Its conductor radius 10 mm and its three insulating materials have relative permittivity of 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*	**10**
			OR			
	8	a)	Discuss on Factors Influencing Corona and Corona Benefits and Disadvantages	*CO2*	*PO1*	**10**

				CO2	PO2	**10**
	b)	A single core cable has a conductor diameter of 3.5 cm and a sheath of inside diameter 5 cm. Evaluate the maximum stress. It is desire to reduce the maximum stress by two inter sheaths and also evaluate their best position of man stress and voltage on each system. Voltage is 33 kV three phase (rms value)				

UNIT - V

			CO	PO	Marks
9	a)	Explain with neat diagram for Elements of DC distribution systems (schematic diagram of LT DC distribution systems).	CO3	PO1	**06**
	b)	Derive the expression for A.C distributors with concentrated loads of referring power factor: Power Factors referred to respective load voltages	CO3	PO1	**06**
	c)	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.	CO3	PO2	**08**

OR

			CO	PO	Marks
10	a)	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	**08**

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

			CO	PO	Marks
		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.			
	b)	What are the factors considered for site selection of sub-station and also comparison of outdoor sub-station & indoor sub-station?	CO3	PO1	**06**
	c)	Discuss on methods of neutral earthing and importance of neutral grounding	CO3	PO1	**06**

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