

Code No: 128BH JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B. Tech IV Year II Semester Examinations, May - 2019 EHV AC TRANSMISSION (Electrical and Electronics Engineering)

Time: 3 hours

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Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

- 1.a) What is the necessity of EHV AC Transmission? [2] Derive the expression for equivalent radius of a bundle conductor. b) [3] Write the charge potential relation of a multi conductor line. [2] c) Derive the cosine law of variation of 'E' with ' θ '. d) [3] What is Corona? [2] e) Draw Bode frequency plot of positive and negative corona pulses. f) [3] Write short notes on travelling waves in EHV.A.C lines. [2] g) An overhead line with $Z_0=500$ ohms continues into a cable with $Z_c=200$ ohms. A surge h) with a crest value of 2000 kV is coming towards the junction from the overhead line. Calculate the voltage in the cable. [3] Write short notes on Static Reactive compensating system. i) [2] Draw the diagram showing extra long line with shunt reactors at ends and at an i) intermediate station. [3]
 - PART B
- 2. The dimensions of the 3-phase, 400 kV horizontal line shown in the figure are H=15 m, S = 11 m phase separation, Conductor is $2 \times 3.18 \text{ cm}$ diameter, Bundle spacing B=45.72 cm. Calculate the matrix of inductance per km for transposed and un transposed lines. [10]





R15



(25 Marks)

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3.	Write down the procedure for diagonalization of Inductance matrix $L = \begin{bmatrix} L_s & L_m \\ L_m & L_m \end{bmatrix}$	$egin{array}{ccc} L_m & L_m \ L_S & L_m \ L_m & L_S \end{array} \end{bmatrix}$
	of a transposed line.	[10]
4.	Derive the expression for voltage (charge voltage relation) of two conductor line. OR	[10]
5.	Starting from the fundamentals derive the expression for potential relation multi conductor lines.	ions for [10]
6.a) b)	Explain in detail generation characteristics and limits of AN. Discuss the Corona loss formulae.	[5+5]
7.a) b)	Explain in detail the measurement of Audible Noise. Explain the corona pulses, their generation and properties	[5+5]
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8.	Derive the expression for total electrostatic field component of a 3-phase, singl AC line.	le circuit [10]
	OR	
9.	Derive the expressions for induced voltages in the un energized line when only one	
	circuit is energized in the double circuit line.	[10]
10.a)	Explain cascade connection of components in shunt and series compensation.	[5+5]
0)	OP	[]+]
11 a)	Explain the voltage control using synchronous condenser	
b)	Explain the sub synchronous resonance in a series capacitor.	[5+5]
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