Course Code: 23EE5T09

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

III - B.Tech I-Semester Regular Examinations (BR23), Nov/Dec - 2025

POWER SYSTEMS- II (EEE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B

*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	Write the advantages of double circuit lines.	(2M)	CO1	BL1
b)	What are the conductor materials used for transmission lines?	(2M)	CO1	BL1
c)	How is transmission lines classified?	(2M)	CO2	BL1
d)	What is meant by surge impedance loading	(2M)	CO2	BL1
e)	What are the types of system transients?	(2M)	CO3	BL1
f)	Draw the equivalent circuit of long transmission line?	(2M)	CO3	BL3
g)	How the Corona Phenomena occurs in transmission lines.	(2M)	CO4	BL1
h)	What are the factors affecting corona	(2M)	CO4	BL1
i)	What are the types of insulators?	(2M)	CO5	BL1
j)	What are the draw backs of loose span in the lines?	(2M)	CO5	BL1

PART–B (5X10 = 50M)

2a.	Derive the inductance of 2-wire transmission line	(5M)	CO1	BL6
b.	Derive the expression for capacitance of three phase transmission line with asymmetrical spacing	(5M)	CO1	BL6
	(OR)			
3a.	In a 3 phase transmission line the three conductors are placed at the corners of a triangle of sides 1.5m, 3m and 2.6m respectively. If the diameter of each conductor is 1.4 cm and the conductors are regularly transposed, calculate the inductance/ phase/ km length of the line	(5M)	CO1	BL3
b.	What factors must be taken into account while calculating the resistance of overhead line conductors. How are these factors account for ?	(5M)	CO1	BL1

4a.	Derive the A, B, C and D constants for Nominal –T method.	(5M)	CO2	BL6
b.	A single phase overhead transmission line is transmitting 1200kW power to factory at 11kV at 0.8 P.F lag. The line resistance and loop reactance of the line are 3 Ω and 5 Ω per phase. Determine i)Source voltage ii) Percentage regulation iii) Efficiency.	(5M)	CO2	BL3
	(OR)			
5a.	A single-phase overhead transmission line is delivering 600kVA load at 2kV. Its	(5M)	CO2	BL3

	resistance and reactance are 0.18 Ω and 0.36 Ω per phase. Determine the voltage regulation if the load power factor is i)0.8 P.F lag ii) 0.8 P.F lead.			
b.	Derive the A, B, C and D constants of long transmission lines using Rigorous solution.	(5M)	CO2	BL6

6a.	Discuss the propagation of surges in transmission lines.	(5M)	CO3	BL6
b.	What is a travelling wave? Explain the development of such a wave on an overhead line.	(5M)	CO3	BL1
	(OR)			
7a.	Deduce expression for velocity of propagation of travelling waves.	(5M)	CO3	BL4
b.	How the travelling waves are attenuated, describe numerically?	(5M)	CO3	BL1

8a.	Explain the concept of corona in transmission system.	(5M)	CO4	BL2
b.	Explain the methods to minimize the effect of corona on transmission system.	(5M)	CO4	BL2
	(OR)			
9a.	Explain the effect of atmospheric factors on corona occurrence	(5M)	CO4	BL2
b.	Write the formula to calculate critical voltage and explain each term in it. Also explain the factors that affects critical voltage.	(5M)	CO4	BL1

10a	What is a stringing chart? Explain its application.	(5M)	CO5	BL1
b.	A string of suspension insulators consists of 5 units each having capacitance C. The capacitance between each unit and earth is 1/8 of C. Determine the voltage distribution across each insulator in the string as a percentage of voltage of conductor to earth. If the insulators in the string are designed to withstand 36kV maximum, calculate the operating voltage of the line where 5 suspension insulator strings can be used.	(5M)	CO5	BL3
	(OR)			
11a	What is guard ring which is being used in the suspension string type insulator? Deduce the relation for determining the capacitance formed by the ring.	(5M)	CO5	BL1
b.	Each line of a three-phase system is suspended by a string of 3 identical insulator of self-capacitance C farad. The shunt capacitance of the connecting metal work of each insulator is 0.3C to earth and 0.2C to line. Calculate the string efficiency of the system if the guard ring increases the capacitance to the line of the metal work of the lowest insulator to 0.35C.	(5M)	CO5	BL3

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V. Venkata

24/9/25