R18

ANURAG Engineering College
(An Autonomous Institution)
II B.Tech II Semester Supplementary Examinations, June/July-2024
POWER SYSTEM-II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max.Marks:75**

Section – A (Short Answer type questions) (25 Marks)
Answer All Questions

		Course Outcome	B.T Level	Marks
1.	List out the types of conductors.	CO1	L1	2M
2.	Derive the expression for inductance of single phase transmission line.	CO1	L2	3M
3.	Differentiate short, medium and long transmission lines.	CO2	L1	2M
4.	Explain skin and proximity effect in a transmission line.	CO2	L2	3M
5.	What do you understand by surge impedance loading.	CO3	L1	2M
6.	With a neat sketch, explain about Bewley's Lattice diagram.	CO3	L2	3M
7.	Discuss in brief the phenomenon of Corona.	CO4	L1	2M
8.	Classify the types of Insulators and its advantages.	CO4	L2	3M
9.	What is the significance of stringing chart.	CO5	L1	2M
10.	Derive the formulae for dielectric loss in cables.	CO5	L2	3M

Section B (Essay Questions)
Answer all questions, each question carries equal marks. (5 X 10M = 50M)

11. A)	Derive an expression for the inductance per phase for a 3-phase overhead transmission line when conductors are unsymmetrical placed but the line is completely transposed	CO1	L3	10M

OR

B)	i) Derive the expression for the capacitance of a single phase overhead transmission line.	CO1	L2	5M
	ii) A 1-φ , 25km long overhead line constants of two conductors 1.8 m apart, diameters of each conductors being 6mm. If the line voltage is 33Kv, 50Hz. Determine the charging current of the open circuited line.	CO1	L3	5M

12. A)	i) Derive an expression for regulation and efficiency for the medium line using nominal T-method. Draw vector diagram	CO2	L2	5M
	ii) A 3-phase, 50Hz overhead transmission line100km long has the following constants	CO 2	L3	5M

Resistance/km/phase = 0.1Ω

Inductive reactance/km/phase = 0.2Ω

Capacitive susceptance/km/phase = 0.04x10^{-4} mho

Determine a) the sending end current b) sending end voltage supplying a balanced load of 10,000KW at 66KV, p.f. 0.8 lagging. Use nominal-T method

OR

B)	Evaluate the A,B,C,D parameters for a given long transmission line using rigorous solution and write down the equations for sending end voltage and current?	CO2	L3	10M

13. A)	i) Explain about velocity of travelling wave.	CO3	L2	5M
	ii) A surge of 15kv magnitude travels along a cable towards its junction with an over head line. The inductance and capacitance of the cable and over head line are respectively 0.3mH,0.4 uF &1.5mH,0.012uf.	CO3	L3	5M

OR

B)	i) Explain about attenuation of travelling wave.	CO3	L2	5M
	ii) A surge of 100 kv travelling in a line of natural impedance 600 ohms arrive at a junction with two lines of impedances 800 ohms &200 ohms find surge voltages and currents transmitted into each branch line.	CO3	L3	5M

14. A)	What is corona? State the factors that affect the Corona loss? What are the methods of reducing corona effect?	CO4	L2	10M

OR

B)	i) Explain various methods of improving string efficiency.	CO4	L2	5M
	ii) The self capacitance of each unit in a string of three suspension insulators is C. The shunting capacitance of the connecting metal work of each insulator to earth is 0.15C while for line it is 0.1C. Calculate the voltage across each insulator as a percentage of the line voltage to earth and string efficiency.	CO4	L3	5M

15. A)	i) Discuss the effect of both wind & ice on sag calculation?	CO5	L2	5M
	ii) A 33KV transmission line has the following data: weight of conductor=800Kg/Km, length of span=300m, ultimate strength=3500Kg, safety factor=2. Calculate the height above ground at which the conductor should be supported. Ground clearance required is 10m.	CO5	L3	5M

OR

B)	i) Derive expression for dielectric stress in a single core cable.	CO5	L2	5M
	ii) Explain grading of Cables.	CO5	L3	5M