

**PRAGATI ENGINEERING COLLEGE: SURAMPALEM**  
**(AUTONOMOUS)**  
**III B.Tech I Semester Supplementary Examinations, May - 2024**

**POWER SYSTEMS-II**  
**(Electrical and Electronics Engineering)**

Time: 3 hours

Max. Marks: 70 M

**Answer ONE Question from each Unit**  
**All Questions Carry Equal Marks**

Q. No.	Questions	BTL	CO	Marks
<b>UNIT – I</b>				
1.	a) Explain the concept of reactive power in single phase and three phase circuits.	K2	CO1	7 M
	b) Derive the expression of inductance in 3-Phase symmetrically spaced transmission lines.	K2	CO1	7 M
<b>OR</b>				
2.	a) What are ACSR conductors? Explain the advantage of ACSR conductors when used for over head lines.	K1	CO1	7 M
	b) A three phase double circuit line has its conductors at the vertices of a regular hexagon with side 5 m. The diameter of each conductor is 2.2cm. Find the inductance per phase per km.	K3	CO1	7 M
<b>UNIT – II</b>				
3.	a) Draw and explain the equivalent circuit of short transmission line by using the phasor diagram.	K2	CO2	7 M
	b) Explain clearly the “ Ferranti Effect” with a phasor diagram.	K2	CO2	7 M
<b>OR</b>				
4	a) Explain the classification of lines based on their length of transmission with neat diagram.	K2	CO2	7 M
	b) Explain how you obtain A,B,C,D parameters of a model of long transmission line.	K2	CO2	7 M
<b>UNIT – III</b>				
5	a) List and explain different types of system transients and how do they effect the overall performance of the system.	K2	CO3	7 M
	b) What is reflection & refraction coefficient of current and voltage wave of transmission line when receiving end is open circuited?	K2	CO3	7 M
<b>OR</b>				
6	a) Explain about the attenuation and Distortion.	K2	CO3	7 M
	b) A surge of 200 kV travels on a line of surge impedance 400 ohm and reaches junction of the line with two branch lines. The surge impedance of branch lines are 400 ohm and 40ohm. Find the transmitted voltage and currents.	K3	CO3	7 M
<b>UNIT – IV</b>				
7	a) Write the advantages and Disadvantages of Corona.	K2	CO4	7 M
	b) A 3-phase, 200 kV, 50 Hz transmission line consists of 1.2 cm radius conductor spaced 2 meters apart in equilateral triangular formation. If the temperature is 40°C and atmospheric pressure is 76 cm, calculate the corona loss per km of the line. Take $m_0 = 0.85$ .	K2	CO4	7 M

OR					
8	a)	What are the factors affecting the corona and explain methods reducing corona?	K1	CO4	7 M
	b)	A 132 kV line with 2 cm diameter is built so that corona takes place if the line voltage is 200 kV (r.m.s). If the value of potential gradient at which ionization occurs can be taken as 30 kV per cm (peak). Find the spacing between the conductors.	K3	CO4	7 M
UNIT – V					
9	a)	What is sag template? Explain how this is useful for location of towers and stringing of power conductors.	K2	CO5	7 M
	b)	In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 15% of self capacitance of each insulator, find (i) the distribution of voltage over 3 insulators and (ii) string efficiency.	K3	CO5	7 M
OR					
10	a)	Derive the expression for sag and tension when the supports in equal levels.	K2	CO5	7 M
	b)	Describe the vibration of power conductors and explain the methods used to damp out these vibrations.	K2	CO5	7 M