R20 Regulation *Subject code: 3P5BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, July 2024

POWER SYSTEMS-II

(Electrical and Electronics Engineering)

Maximum Marks: 70 Date:26.07.2024 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

	Part-A	CO	Bloom Tx
All the following questions carry equal marks (10X2M=20 Marks)			
1	List different types of conductors?	CO1	L3
2	Define GMD and GMR?	CO1	L1
3	What is medium transmission line ?	CO2	L1
4	Define regulation of a short 3-phase transmission system?	CO2	L2
5	Give the formulas for transmission parameters of long lines	CO3	L3
6	Define wave length.	CO3	L2
7	What is skin effect?	CO4	L1
8	What is attenuation?	CO4	L1
9	Define Sag and write its formula.	CO5	L2
10	Define string efficiency of an insulator.	CO5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			Bloom Tx level
11	a) Derive the expression for inductance of three phase transmission line with symmetrical spacing. [5]	CO1	L3
	b) In a 3 phase transmission line the conductors are placed at the corners of an equilateral triangle of each side 2.5cm. If the radius of each conductor is 0.8cm. Determine the inductance per phase per kilometer. [5]	CO1	L5
	OR		
12	a) Briefly discuss the various types of conductor material used for over head transmission line. [5]	CO1	L1
	b) Explain the Effect of ground on capacitance of transmission line. [5]	CO1	L2
13	a) Derive the expression for regulation of a medium transmission line using nominal π method. Draw phasor diagram also. [5]	CO2	L3
	b) Explain the Classification of Transmission Lines. [5]	CO2	L2
	OR		
14	a) Derive the ABCD parameters of a nominal T represented medium length transmission line. [5]	CO2	L3

	b) A 3-phase, 50 Hz, 150 Km long line has a resistance, inductive reactance and shunt capacitive admittance of 0.1 Ohm, 0.5 Ohm, and 3×10^{-6} Mho/ Km/ phase. If the line delivers 50 MW at 110 KV and 0.8 pf lagging. Determine the sending end voltage and current. Assume nominal Pi model for the line. [5]	CO2	L5
15	Explain the surge impedance loading for long transmission lines with necessary expressions. [10]	CO3	L2
	OR		
16	A 3-Φ transmission line 200 km long has the following constants: Resistance/phase/km = 0·16 Ω , Reactance/phase/km = 0·25 Ω Shunt admittance/phase/km = $1 \cdot 5x\ 10^{-6}$ S Calculate by rigorous method the sending end voltage and current when the line is delivering a load of 20 MW at 0·8 p.f. lagging. The receiving end voltage is kept constant at 110 kV. [10]	CO3	L5
17	a) Explain the phenomenon of corona. What are the factors that affects the corona. [5]	CO4	L2
	b) What is a travelling wave? Explain the development of such a wave on an overhead line. [5]	CO4	L2
	OR		
18	a) Explain proximity and Ferranti effect. [5]	CO4	L2
	b) Explain phenomena of critical destructive voltage. [5]	CO4	L2
19	a) Discuss the Effect of Wind and Ice on weight of Conductor. [5]	CO5	L6
	b) Derive an expression for sag, when the supports are at equal heights. [5]	CO5	L3
	OR		
20	a) Explain methods of improving string efficiency. [5]	CO5	L2
	b) Derive the voltage equation of potential distribution over a string of suspension insulators. [5]	CO5	L3