R22 Regulation *Subject code:4E4BE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Regular/Supplementary Examinations, June 2026

POWER SYSTEMS-II

(EEE)

Maximum Marks: 60 Date:17.06.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 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

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	Bloom Tx
1.a)	What are the parameters of a transmission line?	1M	1	1
b)	Name one advantage of corona.	1M	1	1
c)	What is the function of series inductors	1M	2	1
d)	How low powerfactor effects kVA rating of the devices in power systems	1M	2	3
e)	What is the significance of per unit reactance?	1M	3	3
f)	Define surge impedance	1M	3	1
g)	How do you protect transmission lines against lightning	1M	4	2
h)	Why is a Peterson coil used in power systems?	1M	4	2
i)	Which type of fault is most severe in power systems?	1M	5	1
j)	Define LG-fault.	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Explain the short transmission line with phaser diagram.	10M	1	2
	OR			
3	a) Explain the methods of reducing corona loss. b) A transmission line conductor has radius 1.2 cm and spacing 1.5 m. Calculate the visual critical voltage.	5M 5M	1	3 4
4	a) Explain the role of series capacitors in power systems. b) Describe the working of on-load tap changing transformer.	5M 5M	2	2 2
	OR			
5	Discuss various methods of power factor improvement. Compare their merits and demerits.	10M	2	2
6	a) Explain the significance of base quantities in per unit calculations.	5M	3	3

	b) A transmission line has an impedance of 15+j50 Ω. Determine the per unit impedance on: Base voltage = 66 kV Base MVA = 50 MVA	5M		
	OR			
7	a) Discuss travelling waves when a line is connected to a cable. b) A transmission line with surge impedance 400 Ω is terminated by a resistance of 600 Ω. Determine: i) Reflection coefficient ii) Reflected voltage for an incident wave of 50 Kv	5M 5M	3	2 4
8	a) Discuss the operation of surge diverters. b) A transmission tower has footing resistance of 12 Ω. A lightning stroke of 25 kA hits the tower. The line insulation can withstand 350 kV. Determine: i) Tower potential rise ii) Whether back flashover occurs	5M 5M	4	2 4
	OR			
9	Explain the construction and operation of expulsion type lightning arrester.	10M	4	2
10	a) Explain line-to-line fault analysis. b) Explain average 3-phase power in terms of symmetrical components.	5M 5M	5	2 2
	OR			
11	Derive the sequence network equations for fault analysis.	10M	5	2