R22 Regulation *Subject code: 4E6BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, November 2025

POWER SYSTEM PROTECTION

(EEE)

Maximum Marks: 60 Date: 19.11.2025 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 essential qualities of relay?	1M	CO1	BT1
b)	List the disadvantages of microprocessor based relays.	1M	CO1	BT1
c)	What is meant by fault current.	1M	CO2	BT2
d)	Define over current protection.	1M	CO3	BT2
e)	How are pilot-wire relays built for transmission-line protection?	1M	CO2	BT2
f)	What are the causes of bus zone faults?	1M	CO2	BT1
g)	List the merits of static relays over electromagnetic relays.	1M	CO1	BT1
h)	What are the different types of distance relays?	1M	CO3	BT1
i)	What is meant by current chopping?	1M	CO4	BT1
j)	Name the types of fuses.	1M	CO4	BT1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) What is protective relay? Discuss the basic requirements of relay. b) Write a note on significance of primary and back up protection.	5M 5M	CO1	BT2
	OR			
3	Discuss the need for static relays. Explain the basic units in a static relay. Enumerate the advantages and disadvantages of static relay.	10M	CO1	BT2
4	Illustrate about the earth fault and phase fault protection with neat sketches.	10M	CO2	BT4
	OR			
5	Show the MHO relay characteristic on the R-X diagram. Discuss the range setting of various distance relays placed on a particular location.	10M	CO2	BT4
6	With a neat sketch, explain the operation of carrier current protection scheme.	10M	CO2	BT3
	OR			
7	a) A generator is protected by restricted earth fault protection. The generator ratings are 13.2 KV, 10 MVA. The percentage of winding	5M	CO2	BT3

	protected against Phase to earth fault is 85%. The relay setting is such that it trips for 20% out of balance. Calculate the resistance to be added in the neutral to ground connection. b) With a neat sketch, explain the working principle of Frame Leakage protection scheme.	5M		
8	Describe the function of synthesis of Mho relay using static phase comparator with a neat block diagram.	10M	CO3	BT2
	OR			
9	a) Explain microprocessor based inverse time over current relay. b) What is Distance relay? Explain the operation of impedance relay with its characteristics.	5M 5M	CO3	BT2
10	With neat sketch, describe the working principle of an axial air blast type circuit breaker.	10M	CO4	BT3
	OR			
11	Discuss the operating principle of SF6 circuit breaker, what are its advantages over other types of circuit breakers and for what voltage range it is recommended.	10M	CO4	BT3

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