R18 Regulation *Subject code:2P7BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, November 2025

POWER SYSTEM PROTECTION

(EEE)

Maximum Marks: 70 Date: 28.11.2025 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

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	What is the need for back up protection	2M	1	L1
2	Differentiate series and shunt faults	2M	1	L1
3	Name the different types of distance relays	2M	2	L1
4	List out few salient points of directional relays	2M	2	L1
5	What are the consequences of loss of excitation in generators	2M	3	L1
6	What is Buchholz relay? What for it is used?	2M	3	L1
7	Write the importance of digital relays?	2M	4	L1
8	List the demerits of static relays over electromagnetic relays	2M	4	L1
9	Write the characteristics of fuse?	2M	5	L1
10	What is current chopping?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Describe the working of electromagnetic relay with the help of neat sketch.	10M	1	L2
	OR			
12	a) Explain the operation of induction cup relay. b) Give the detailed classification of protective relays and schemes.	5M 5M	1	L2
13	What is an impedance relay? Discuss its principle of operation. Show its characteristics on R-X diagram. What is the merit of this relay for transmission line protection?	10M	2	L2
	OR			
14	a) Discuss why R-X loci of impedance relay is a circle having center as origin. b) Draw and explain the circuit for the protection of ring main system.	5M 5M	2	L2
15	a) Discuss in detail about the three zone protection of transmission lines. b) Explain the concept of carrier current protection.	5M 5M	3	L2
	OR			
16	a) What are the different faults of transformer? Explain.	5M	3	L2

	b) What are different faults occurring in rotor of alternators? Explain any one of it.	5M		
17	a) Explain the operation of static phase comparator used in static relays. b) Discuss the operation of static differential relay.	5M 5M	4	L2
	OR			
18	Draw the block diagram and explain the operation of microprocessor based digital relays.	10M	4	L2
19	a) Explain the working of an SF6 circuit breaker with the help of diagram. b) A circuit breaker is rated at 1500A, 2000MVA, 33kV, 3 sec, 3 phase oil circuit breaker. Find the normal rated current, breaking current, making current and shot time current rating?	5M 5M	5	L2
	OR			
20	a) Describe the operational phenomena of an air blast Circuit breaker. b) Explain the concept of resistance switching. Also list out its drawbacks.	5M 5M	5	L2