R20 Regulation *Subject code: 3P6BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, February 2024

POWER SYSTEM PROTECTION

(Electrical & Electronics Engineering)

Maximum Marks: 70 Date:17.02.2024 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 which carries 10M.
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)		CO	Bloom Tx
1	What is the need for back up protection	CO1	L2
2	Differentiate series and shunt faults	CO1	L2
3	Name the different types of distance relays	CO2	L2
4	List out few salient points of directional relays	CO2	L2
5	What are the consequences of loss of excitation in generators	CO3	L2
6	What is pilot wire.	CO3	L2
7	Give the classification of static relays	CO4	L2
8	Differentiate amplitude and phase comparators used in static relays	CO4	L2
9	What is recovery rate voltage	CO5	L2
10	Write the properties of SF6 gas	CO5	L2
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Describe the working of electromagnetic relay with the help of neat sketch. (10M)	CO1	L2
	OR		
12	A. Why current transformer is not operated with its secondary winding open circuited. (5M) B. Discuss the operation of micro processor based relays. (5M)	CO1	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)	CO2	L2
	OR		
14	A. Discuss the working of directional earth fault relay. (5M) B. Draw and explain the protection scheme for parallel feeders. (5M)	CO2	L2
15	A. What are the main faults that occur in generators? Explain the protection of generators against rotor faults. (5M)	CO3	L2

	B. The neutral point of a 11 kV alternator is earthed through a resistance of 12Ω, the relay is set to operate when there is out of balance current of 0.8 A. The C.T.s have a ratio of 200/5. What percentage of the winding is protected against earth faults? What must be the minimum value of earthing resistance required to give 90% of protection to each phase? (5M)		
	OR		
16	A. What is a Buchholz relays? Explain its operation. (5M)	CO3	L2
	B. The primary winding of a transformer has 2000 turns and CT ratio is 600:5. The secondary has 10000 turns and is working on a tap of 60%. Find out CT ratio required for secondary side to establish circulating current scheme. (5M)		L2
17	Differentiate between amplitude comparators and phase comparators? (10M)	CO4	L2
	OR		
18	A. What are the advantages of static directional relay? (5M) B. What is static amplitude comparator? (5M)	CO4	L2
19	What are the applications of WAMS? Discuss in detail? (10M)	CO5	L2
	OR		
20	Explain in detail different types of system protection schemes. (10M)	CO5	L2