

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Sixth Semester

Electrical and Electronics Engineering

EE3601 – Protection and Switchgear

Regulations -2021

Duration : 3 Hrs

Maximum: 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	What is a protective scheme?	L2	1	2
2.	List the methods of grounding.	L2	1	2
3.	What is R-X diagram?	L2	2	2
4.	Compare distance and differential relays.	L2	2	2
5.	What is the role of instrument transformers in protection?	L2	3	2
6.	Name a common protection scheme for bus bars.	L2	3	2
7.	Compare phase and amplitude comparators.	L1	4	2
8.	What is distance protection used for in transmission lines?	L1	4	2
9.	Can a circuit breaker be used as a manual switch?	L1	5	2
10.	Classify the types of circuit breakers.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11.	a i Explain the fundamental principles of equipment protection schemes.	L1	1	8
	ii Describe the typical zones of protection implemented in a power system, providing examples of the equipment included in each zone.	L2	1	8
	Or			
	b i Classify and comprehensively describe the major categories of protection schemes used in electrical power systems.	L1	1	8
	ii Describe and compare the different types of power system grounding methods.	L2	1	8
12.	a i What is a significance role of protective relay? and explain its fundamental role in a power system protection scheme.	L2	2	8
	ii Develop a torque equation of a protective relays.	L3	2	8

Or

	b	i	Explain the fundamental principle of operation of a directional relay.	L2	2	8
		ii	Describe the operating principle of a negative sequence relay.	L2	2	8
13.	a	i	Distinguish between CT and PT.	L3	3	8
		ii	Analyze the protection characteristics of transmission lines.	L4	3	8
Or						
	b	i	Discuss the protection schemes used for the rotor (field) windings of a synchronous generator.	L2	3	8
		ii	Discuss the common faults and abnormal operating conditions that can occur in electric motors and necessitate appropriate protection schemes.	L3	3	8
14.	a	i	Explain the fundamental operating principles of static relays.	L2	4	8
		ii	Describe the fundamental operating principle of a comparators.	L2	4	8
Or						
	b	i	Analyze the coordination considerations between the primary and secondary side overcurrent relays are taking into account the transformer's turns ratio and impedance.	L3	4	8
		ii	A circuit has a continuous maximum load current of 20 A. According to safety standards, the overcurrent protection device should be rated at least 125% of the continuous load. What is the minimum rating of a fuse that can be used to protect this circuit?	L4	4	8
15.	a	i	Discuss the re-striking and recovery voltage in the circuit breakers.	L2	5	8
		ii	Explain the construction and operation of SF6 circuit breaker and its applications.	L2	5	8
Or						
	b	i	Analyze the performance of resistance switching and current chopping.	L3	5	8
		ii	A circuit breaker is to be installed in a system with a maximum operating voltage of 13.2 kV. According to standards, the circuit breaker's voltage rating should be at least 110% of the maximum operating voltage. What is the minimum voltage rating required for this circuit breaker?	L4	5	8