

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

III - B.TechII-Semester Regular Examinations (BR23), MAY - 2026

SWITCHGEAR AND PROTECTION (EEE)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) Explain the term Restriking voltage	(2M)	CO1	BL1
b) What is meant by arc interruption	(2M)	CO1	BL2
c) Explain where and why you would prefer directional current relay.	(2M)	CO2	BL1
d) What is an IDMT relay?	(2M)	CO2	BL1
e) Write short notes on inter turn faults in an alternator	(2M)	CO3	BL1
f) What type of faults are detected by Buchholz relay?	(2M)	CO3	BL1
g) Define overcurrent protection.	(2M)	CO4	BL1
h) Define plug setting multiplier (PSM)	(2M)	CO4	BL1
i) Discuss the relative merits and demerits of Valve arresters and rod gaps	(2M)	CO5	BL1
j) What is a lightning arrester?	(2M)	CO5	BL1

PART-B (5X10 = 50M)

2a. In a system having 220kV, the line to ground capacitance 0.018 microfarad, inductance 4.5 H. Find the voltage appearing across the pole of the circuit breaker if a magnetizing current of 8.5A instantaneous, is interrupted. Calculate also the value of resistance to be used across the contacts to eliminate the restriking voltage?	10(M)	CO1	BL2
(OR)			
3a. Describe the operation of Vacuum circuit breaker with diagram and list out its merits and demerits	10(M)	CO1	BL2
4a. Explain the working of overcurrent and undervoltage relays with suitable diagrams.	10(M)	CO2	BL2
(OR)			
5a. A 13.8 kV, 75 MVA generator is protected by a differential scheme. The protection covers 85% of the winding. The relay operates when 20% of full-load current flows. Find: (i) Full-load current (ii) Relay operating current (iii) Value of neutral grounding resistance.	10(M)	CO2	BL2
6a. Describe various rotor faults and their protection methods in generators.	10(M)	CO3	BL2
(OR)			
7a. Explain restricted earth fault (REF) protection with diagram and working principle.	5(M)	CO3	BL2
b Explain the percentage differential protection of a Alternator	5(M)	CO3	BL2

8a.	Explain differential protection of bus bars with a neat diagram.	5(M)	CO4	BL2
b	Explain overcurrent protection schemes with neat diagrams (OR)	5(M)	CO4	BL2
9a.	Explain how the carrier current protection scheme is used for Feeder protection.	5(M)	CO4	BL2
	Compare impedance, reactance, and mho relays	5(M)	CO4	BL1
b.				
10a	Explain the following: i) Dry flashover voltage ii) Wet flash over voltage iii) Impulse flash over voltage.	5(M)	CO5	BL2
b	Explain the protective schemes used in substations against lightning. (OR)	5(M)	CO5	BL2
11a	Explain the phenomenon of arcing ground and its consequences.	5(M)	CO5	BL2
b.	Explain protection against lightning overvoltages	5(M)	CO5	BL2
