SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Supplementary Examinations June-2024
POWER SYSTEM PROTECTION
(Electrical & Electronics Engineering)

Time: 3 Hours   **Max. Marks: 60**

PART-A
(Answer all the Questions 5 x 2 = 10 Marks)

1	a	What is meant by a circuit breaker? Explain its function.	CO1	L2	2M
	b	Define relay List out classification of Relays.	CO3	L1	2M
	c	How do you protect generator against stator faults?	CO4	L1	2M
	d	Define Pick up current.	CO5	L1	2M
	e	Why earth wire is provided in overhead transmission lines?	CO6	L1	2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	Explain the terms recovery voltage, restriking voltage and RRRV. Derive an expression for restriking voltage in terms of system capacitance and inductance.	CO1	L3	10M

OR

3	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.	CO2	L2	10M

UNIT-II

4	Describe the principle of Impedance relay and explain its characteristics on R-X- planes.	CO3	L2	10M

OR

5	a	Explain the constructional details and operation of attracted armatures relay.	CO3	L1	5M
	b	With a neat diagram explain the working of induction type directional over current relay?	CO3	L1	5M

UNIT-III

6	a	Calculate the required value of neutral resistance for a 3-phase 11kv alternator so as to protect 70% of the winding against earth-fault by a relay with pick-up current of 1 A. The neutral CT has a ratio of 250/5.	CO4	L2	5M
	b	Discuss the different types of transformer faults. What are various protective schemes available for transformers?	CO4	L1	5M

OR

7	A 6.6 kV, 4000 kV A star connected alternator with a transient reactance of 2 Ω /phase And negligible resistance, is protected by a circulating current protective system. The alternator neutral is earthed through a resistor of 7.5Ω. The relays are set to operate when there is an out of balance current of 1 A in the secondary windings of the 500/5 current Transformers. what percentage of each phase winding is protected against an earth fault?	CO4	L2	10M

UNIT-IV

8 Explain about the over current protection of bus bars with relevant connection diagram. CO5 L1 10M

OR

9 With neat Diagram Explain the Three zone distance protection in 3-Phase transmission line. CO5 L1 10M

UNIT-V

10 **a** Explain the working of valve type lightning arrester. CO6 L1 5M

  b Enumerate the basic concepts of insulation coordination. CO6 L1 5M

OR

11 **a** With a neat diagram explain the operation of any one type of lightning arrester. CO6 L1 5M

  b Discuss and compare the various methods of neutral earthing explain. CO6 L1 5M

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