O.P.Code: 23EE0228 | R23 | H.T.No. | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular Examinations April-2026
SWITCH GEAR AND PROTECTION
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	What is Rate of Rise of Recovery Voltage (RRRV).	CO1	L1	2M
	b	Write two advantages of SF6 circuit breakers.	CO1	L1	2M
	c	State any two basic requirements of protective relays.	CO2	L1	2M
	d	Define Plug setting multiplier.	CO2	L1	2M
	e	What is meant by inter-turn fault protection of generators?	CO3	L1	2M
	f	Mention different types of faults occurs in generator.	CO3	L1	2M
	g	Which relay is commonly used for protection of feeders?	CO4	L1	2M
	h	Mention any two advantages of carrier current protection.	CO4	L1	2M
	i	List any two causes of over voltages in power systems.	CO5	L1	2M
	j	What are the advantages of neutral grounding?	CO5	L1	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	a	Explain the principle of ARC extinction.	CO1	L2	5M
	b	Discuss the different methods of "ARC" extinction.	CO1	L1	5M

OR

3		Explain the principle and operation of Vacuum Breaker with diagram.	CO2	L2	10M

UNIT-II

4	a	What is protective relay? Discuss the basic requirements of relay.	CO3	L1	5M
	b	Explain the constructional details and operation of attracted armatures relay.	CO3	L2	5M

OR

5		Explain working of microprocessor based over current relay with suitable diagram.	CO3	L2	5M

UNIT-III

6	a	Explain the operation of Differential protection scheme for of alternator with a neat diagram.	CO4	L1	5M
	b	Calculate the required value of neutral resistance for a 3-phase11kv alternator so as to protect 70% of the winding against earth-fault by a relay with pick-up current of 1A. The neutral CT has a ratio of 250/5.	CO4	L3	5M

OR

7		Explain the significance for the protection of transformers and explain the Buchholz relay protection with neat block diagram.	CO4	L2	

UNIT-IV

8	a	Elaborate on various methods for protection of feeders.	CO5	L1	
	b	What is the importance of bus-bar protection? What are the requirements of protection of lines?	CO5	L1	

OR

9		Describe the principle of bus -bar protection based on voltage differential systems. How does it Overcome the problems of saturation of CT's?	CO5	L1	1

UNIT-V

10	a	Discuss the phenomena of a lightning stroke.	CO6	L1	
	b	Explain the working of valve type lightning arrester.	CO6	L2	

OR

11	a	Briefly explain the various methods of overvoltage protection of overhead transmission line.	CO6	L2	
	b	What is horn gap arrester? Explain how it works. What is the purpose of inserting a Resistance between horn gap arrester and the line?	CO6	L1	

*** END ***