CBCS SCHEME

SRI SAIRAM COLLEGE OF ENGINEERING

USN | | | | | | | | | | |

BEE701

Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Switchgear and Protection

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With a help of neat diagram, explain briefly the zones of protection. Write the need for protective schemes.	10	L2	CO1
	b.	Discuss the classification of protective relays and explain them briefly.	10	L2	CO1
		OR			
Q.2	a.	Explain the following armature relays : i) Hinged Armature Type Relay ii) Plonger Type Relay iii) Reed Relay	12	L2	CO1
	b.	Discuss the merits and demerits of Electro mechanical Relay and Numerical Relay.	8	L2	CO1
		Module – 2			
Q.3	a.	Discuss the significance of the Time current characteristics and also define the terms Plug setting Multiplier and Time Multiplier setting with relevant formulas.	10	L2	CO2
	b.	With the help of block diagram , explain definite time over current relay.	10	L2	CO2
		OR			
Q.4	a.	Describe the over current protection for parallel Feeders and Ring Mains.	10	L2	CO2
	b.	Explain with the help of neat sketch the construction of reactance relay. Obtain its torque equation and draw the operating characteristics on R – X diagrams.	10	L2	CO2
		Module – 3			
Q.5	a.	Explain the working of following differential relays : i) Current differential relays ii) Percentage differential relays	10	L2	CO3
	b.	With a neat sketch, explain the operation of restricted earth fault protection for generators.	10	L2	CO3
		OR			
Q.6	a.	Describe the different types of faults encountered in Transformer. Explain the function of Buchholz Relay.	10	L2	CO3
	b.	A 11 KV , 100 MVA alternator is provided with differential protection. The percentage of winding to be protected against phase to ground fault is 85%. The relay is set to operate when there is 20% out of balance current. Determine the value of the resistance.	10	L3	CO3

SRI SAIRAM COLLEGE OF ENGINEERING

		Module – 4			
Q.7	**a.**	Discuss the Recovery rate theory and Energy balance theory of arc interruption in a.c. circuit breaker.	**10**	**L2**	**CO4**
	b.	Write a note on physical , chemical and dielectric properties of SF_6 gas and explain non – puffer type SF_6 circuit breaker.	**10**	**L2**	**CO4**
		OR			
Q.8	**a.**	With neat sketch, explain the working of i) Axial blast air circuit breaker ii) Cross blast circuit breaker	**10**	**L2**	**CO4**
	b.	Write notes on : i) Unit testing ii) Synthetic testing	**10**	**L2**	**CO4**
		Module – 5			
Q.9	**a.**	Explain with neat sketch, the construction and working of HRC fuse. Also explain its properties and characteristics.	**8**	**L2**	**CO5**
	b.	What are the causes of over voltages arising on a power system? Why it is necessary to protect the lines and other equipments of the power system against over voltages?	**6**	**L1**	**CO5**
	c.	Explain Expulsion type lighting arrestor.	**6**	**L2**	**CO5**
		OR			
Q.10	**a.**	Describe the various methods used for protection of Transmission lines against Direct Lightning Strokes.	**10**	**L2**	**CO5**
	b.	Discuss the Modern Trends in power system protection and explain Gas Insulated Substation (GIS) switchgear.	**10**	**L2**	**CO5**