

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2026
Switch Gear 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.	List and explain the essential qualities of a protective relay.	6	L2	CO1
	b.	Derive an expression for torque produced by an Induction Relay.	8	L2	CO1
	c.	List the merits and demerits of static relay.	6	L2	CO1
OR					
Q.2	a.	Discuss various zones of protection for a modern power system.	5	L2	CO1
	b.	Write a short note on Automatic Reclosure.	5	L2	CO1
	c.	Define the following terms : i) Relay ii) Operating force iii) Pick up level iv) Reset v) Current setting.	10	L1	CO1
Module - 2					
Q.3	a.	Discuss a protection scheme for parallel feeder.	6	L2	CO2
	b.	Distinguish between Earth Fault Relay and Over Current Relay.	6	L2	CO2
	c.	Explain 3 stepped distance protection of transmission line.	8	L2	CO2
OR					
Q.4	a.	Discuss a protective scheme for ring main feeders.	6	L2	CO2
	b.	With a neat block diagram, explain the microprocessor based impedance relay.	8	L2	CO2
	c.	With a neat block diagram, explain the static inverse time overcurrent relay.	6	L2	CO2
Module - 3					
Q.5	a.	With a neat sketch, discuss the phase comparison scheme for carrier current protection.	7	L2	CO3
	b.	With Schematic diagrams, explain balanced (opposed) voltage differential protection.	7	L2	CO3
	c.	With a neat diagram, explain the working of Buchholz Relay.	6	L2	CO3

OR					
Q.6	a.	With a neat diagram, explain percentage differential protection of star-delta connected transformer.	8	L2	CO3
	b.	Explain the protection of a generator against i) Loss of excitation ii) Stator interturn fault.	8	L2	CO3
	c.	With a neat sketch, explain differential scheme for bus zone protection.	4	L2	CO3
Module – 4					
Q.7	a.	Discuss the Recovery Rate Theory and Energy Balance Theory of arc interruption in AC circuit Breaker.	6	L2	CO4
	b.	With a neat sketch and waveform, explain the interruption of capacitive current.	6	L2	CO4
	c.	Derive an expression for restriking voltage and rate of rise of restriking voltage.	8	L2	CO4
OR					
Q.8	a.	With a neat sketch, explain the working of axial blast Circuit Breaker.	7	L2	CO4
	b.	State the advantages and disadvantages of SF ₆ Circuit Breaker.	5	L2	CO4
	c.	Explain the procedure adopted in Unit test and synthetic testing of Circuit Breaker.	8	L2	CO4
Module – 5					
Q.9	a.	Define the following terms : i) Fuse ii) Fuse element iii) Rated current iv) Minimum fusing current v) Fusing factor.	6	L1	CO5
	b.	Describe the construction and operation of the HRC Cartridge fuse with indicator. Write application of the HRC fuse.	8	L2	CO5
	c.	Write discrimination between fuse and over current protective devices.	6	L1	CO5
OR					
Q.10	a.	Write note on Klydonograph and Magnetic link.	8	L1	CO5
	b.	What is a Gas Insulated Substation? Discuss its advantages and disadvantages as compared to conventional air insulated substation.	8	L2	CO5
	c.	Write short note on Arcing horn with diagram.	4	L1	CO5
