



IV B.Tech I Semester Regular/Supplementary Examinations, Jan/Feb - 2022 SWITCHGEAR AND PROTECTION

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B Answer ALL sub questions from Part-A Answer any FOUR questions from Part-B *****

PART-A (14 Marks)

1.	a) b)	List the main features of Air circuit breakers and Moulded case circuit breakers.	[3]
	c)	Discuss the protection of an alternator running in parallel with others against	[2]
	•)	reverse power.	[0]
	d)	Explain the need for circulating current differential protection scheme for a single bus bar.	[2]
	e)	List the advantages of Static relays	[2]
	f)	Explain how the wave form of a surge is specified.	[2]
		PART–B $(4x14 = 56 Marks)$	
2.	a)	Explain the term rate of rise of re – striking voltage. Dxplain the factors on which it depends	[7]
	b)	Explain the working of a Sulphur hexafluoride (SF ₆) circuit breaker with a neat constructional layout.	[7]
3.	a) b)	Explain the construction and operating principle of Electromagnetic relays. Explain the principle of distance relays stating clearly the difference between impedance relay, reactance relay and mho relay.	[7] [7]
4.	a)	Explain the necessary measures to protect the transformer from excessive	[7]
	b)	A 6000 KVA, 6600 V star connected alternator has a synchronous reactance of 3 ohms per phase and 1 ohm resistance. It is protected by a Mertz Price balanced current system which operates when the out of balance current exceeds 30% of the load current. Determine what proportion of the alternator winding is unprotected if the star point is earthed through a resistor of 6 ohms	[7]
5.	a)	Explain with a neat sketch about the differential relay protection for three phase feeders	[7]
	b)	Explain how the carrier current protection scheme is used for Feeder protection.	[7]

- 6. a) List and explain the various electronic circuits commonly used in static relays. [7]
 - b) Explain the operation of Static over current relay with a neat block diagram. [7]
- 7. a) Explain how a piece of cable between an overhead line and the sub station is [7] effective in reducing the amplitude of the surge arrester and the flattening of the wavefront.
 - b) Explain the various methods of reducing the Switching over voltages. [7]

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