Discipline - Electrical	**Semester-6 th**	**Semester :10/04/2022 – 10/06/2022**
Subject-Switch Gear And Protective Devices	**Theory periods: 4P / week Tutorial: 1P / week**	**Name of the Teaching Faculty-Mrs. Damayanti Bhatt**
WEEK	**DAY**	**TOPICS**
1st	1st	**INTRODUCTION TO SWITCHGEAR** 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment.
	2nd	1.3 Bus-Bar Arrangement
	3rd	1.4 Switchgear Accommodation.
	4th	1.5 Short Circuit
	5th	1.6 Short circuit
2nd	1st	1.7 Faults in a power system.
	2nd	**2. FAULT CALCULATION** 2.1 Symmetrical faults on 3-phase system.
	3rd	2.2 Limitation of fault current
	4th	2.3 Percentage Reactance
	5th	2.4 Percentage Reactance and Base KVA
3rd	1st	2.5 Short – circuit KVA.
	2nd	2.6 Reactor control of short circuit currents
	3rd	2.7 Location of reactors
	4th	2.8 Steps for symmetrical Fault calculations
	5th	2.9 Solve numerical problems on symmetrical fault
4th	1st	2.9 Solve numerical problems on symmetrical fault
	2nd	**3. FUSES** 3.1 Desirable characteristics of fuse element.
	3rd	3.2 Fuse Element materials.
	4th	3.3 Types of Fuses and important terms used for fuses.

	5th	3.4 Low and High voltage fuses.
5th	1st	3.5 Current carrying capacity of fuse element
	2nd	3.6 Difference Between a Fuse and Circuit Breaker
	3rd	**4. CIRCUIT BREAKERS** 4.1 Definition and principle of Circuit Breaker 4.2 Arc phenomenon and principle of Arc Extinction
	4th	4.3 Methods of Arc Extinction 4.4 Definitions of Arc voltage, Re-striking voltage and Recovery voltage.
	5th	4.5 Classification of circuit Breakers 4.6 Oil circuit Breaker and its classification.
6th	1st	4.7 Plain brake oil circuit breaker 4.8 Arc control oil circuit breaker.
	2nd	4.9 Low oil circuit breaker. 4.10 Maintenance of oil circuit breaker
	3rd	4.11 Air-Blast circuit breaker and its classification
	4th	4.12 Sulphur Hexa-fluoride (SF6) circuit breaker
	5th	4.13 Vacuum circuit breakers. 4.14 Switchgear component
7th	1st	4.15 Problems of circuit interruption.
	2nd	4.16 Resistance switching. 4.17 Circuit Breaker Rating.
	3rd	**5. PROTECTIVE RELAYS** 5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay
	4th	5.3 Basic Relay operation 5.3.1. Electromagnetic Attraction type
	5th	5.3.2. Induction type
8th	1st	5.4 Definition of following

		important terms 5.5 Definition of following important terms. 5.5.1. Pick-up current. 5.5.2. Current setting. 5.5.3. Plug setting Multiplier. 5.5.4. Time setting Multiplier
	2nd	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional)
	3rd	5.8 Induction type directional power relay.
	4th	5.9 Induction type directional over current relay
	5th	5.10 Differential relay 5.10.1. Current differential relay 5.10.2. Voltage balance differential relay. 5.11 Types of protection

WEEK	DAY	TOPICS
9th	1st	**6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES** 6.1 Protection of alternator
	2nd	6.2 Differential protection of alternators 6.3 Balanced earth fault protection
	3rd	6.4 Protection systems for transformer. 6.5 Buchholz relay
	4th	6.6 Protection of Bus bar .6.7 Protection of Transmission line
	5th	6.8 Different pilot wire protection (Merz-price voltage Balance system)
10th	1st	6.9 Explain protection of feeder by over current and earth fault relay.
	2nd	**7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING** 7.1. Voltage surge and causes of over voltage.
	3rd	7.2. Internal cause of over voltage. 7.3. External cause of over voltage (lighting)
	4th	7.4. Mechanism of lightning discharge.
	5th	7.5. Types of lightning strokes. 7.6. Harmful effect of lightning.
11th	1st	7.7. Lightning arresters and Type of lightning Arresters. 7.7.1. Rod-gap lightning arrester.
	2nd	7.7.2. Horn-gap arrester
	3rd	7.7.3. Valve type arrester
	4th	7.8. Surge Absorber
	5th	**8. STATIC RELAY:** 8. 1 Advantage of static relay
12th	1st	8. 1 Advantage of static relay

	2nd	8. 2 Instantaneous over current relay.
	3rd	8. 2 Instantaneous over current relay.
	4th	8. 3 Principle of IDMT relay.
	5th	8. 3 Principle of IDMT relay.
13th	1st	REVISION OF INTRODUCTION TO SWITCHGEAR
	2nd	CLASSTEST -01
	3rd	REVISION OF FAULT CALCULATION
	4th	CLASSTEST -02
	5th	REVISION OF FUSES
14th	1st	CLASSTEST -03
	2nd	REVISION OF CIRCUIT BREAKERS
	3rd	CLASSTEST -04
	4th	REVISION OF PROTECTIVE RELAYS
	5th	CLASSTEST -05
15th	1st	REVISION OF PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES
	2nd	CLASSTEST -05
	3rd	REVISION OF PROTECTION AGAINST OVER VOLTAGE AND LIGHTING
	4th	CLASSTEST -06
	5th	REVISION OF STATIC RELAY AND CLASSTEST