

BLACK DIAMOND SCHOOL OF ENGINEERING, JHARSUGUDA**LESSON PLAN****Session-(2022-2023)**

Discipline: Electrical Engineering.	Semester: 6 th	Name of the Teaching Faculty: Jasmin Pandey, Lecturer
Subject : Switch Gear & ProtectiveDevices,Theory-2	No. Of Days/Week: 5	StartDate: 13/02/2023 EndDate: 23/05/2023

Week	Class Day	Theory/Practical Topics
1st	1st	Essential Features of switchgear equipment
	2nd	Bus-Bar Arrangement. Switchgear Accommodation.
	3rd	Short Circuit & Short circuit faults
	4th	Fault in power system
	5th	TUTORIAL CLASS
2nd	1st	ASSIGNMENT QUESTION DISCUSSION
	2nd	Symmetrical faults on 3-phase system. And Limitation of fault current
	3rd	Percentage Reactance. Percentage Reactance and Base KVA. Short – circuit KVA.
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	4th	Reactor control of short circuit currents.
	5th	TUTORIAL PROBLEM
3rd	1st	Location of reactors
	2nd	Steps for symmetrical Fault calculations..
	3rd	Solve numerical problems on symmetrical fault.
	4th	Fuse Element material
	5th	QUIZ TEST
4th	1st	Desirable characteristics of fuse element.
	2nd	Types of Fuses and important terms used for fuses.

	3rd	Low and High voltage fuses.
	4th	Current carrying capacity of fuse element.
	5th	TUTORIAL CLASS
5th	1st	Difference Between a Fuse and Circuit Breaker
	2nd	Definition and principle of Circuit Breaker & Arc phenomenon and principle of Arc Extinction
	3rd	Methods of Arc Extinction. Definitions of Arc voltage, Restriking voltage and Recovery voltage.
	4th	Classification of circuit Breakers Oil circuit Breaker and its classification
	5th	Plain brake oil circuit breaker & Arc control oil circuit breaker
6th	1st	Low oil circuit breaker. & Maintenance of oil circuit breaker
	2nd	Air-Blast circuit breaker and its classification.
	3rd	Sulphur Hexafluoride (SF ₆) circuit breaker & Problems of circuit interruption.
	4th	Vacuum circuit breakers. & Switchgear components
	5th	TUTORIAL CLASS
7th	1st	Resistance switching. & circuit Breaker Rating.
	2nd	Class test
	3rd	Definition of Protective Relay & Fundamental requirement of protective relay.
	4th	Basic Relay operation a) Electromagnetic Attraction type b) Induction type
	5th	TUTORIAL CLASS
8th	1st	Definition of following important terms of relay.
	2nd	Definition of following important terms. a) Pick-up current .b) Current setting. c) Play setting Multiplier. d) Time setting Multiplier.

	3rd	Classification of functional relays
	4th	Induction type over-current relay(Non-directional)
	5th	TUTORIAL CLASS
9th	1st	Induction type directional power relay
	2nd	Induction type directional over current relay.
	3rd	Differential relay a)Current differential relay b)Voltage balance differential 5.11
	4th	Types of protection
	5th	TUTORIAL CLASS
10th	1st	Protection of alternator &Differential protection of alternators.
	2nd	Balanced earth fault protection
	3rd	Protection systems for transformer.
	4th	Buchholz relay &Protection of Bus bar.
	5th	TUTORIALCLASS
11th	1st	Protection of Transmission line
	2nd	Different pilot wire protection (Merz-price voltage Balance system)
	3rd	Explain protection of feeder by overcurrent and earth fault relay
	4th	Voltage surge and causes of overvoltage
	5th	TUTORIALCLASS
12th	1st	Internal cause of over voltage
	2nd	External cause of overvoltage
	3rd	Mechanism of lightning discharge.
	4th	Types of lightning strokes. Harmful effect of lightning.& Lightning arresters.
	5th	TUTORIALCLASS
13th	1st	External cause of overvoltage
	3rd	Type of lightning Arrestors. a)Rod-gap lightning arrester.
	4th	b)Horn-gap arrester. c)Valve type arrester.
	5th	TUTORIALCLASS

14th	1st	Surge Absorber
	2nd	Advantage of static relay.
	3rd	Instantaneous over current relay.
	4th	Principle of IDMT relay
	5th	TUTORIAL CLASS
15th	1st	REVIEW CLASS
	2nd	REVIEW CLASS
	3rd	VERY SIMILAR TEST
	4th	VERY SIMILAR TEST
	5th	VERY SIMILAR TEST