PNS SCHOOL OF ENGINEERING AND TECHNOLOGY		
Branch: Electrical Engineering	Semester: 6^{TH}	Name of the Lecturer: **Chacha Amitav Tripathy**
Subject: SGPD	No of Classes Alloted in a Week: 5	Duration of Semester: 14.2.2023 - 23.5.2023
Week	Class Day	Theory / practical Topic
1st	1	**INTRODUCTION TO SWITCHGEAR:** Essential Features of switchgear, switchgear Equipment.
	2	Bus-Bar Arrangement, Switchgear Accommodation.
	3	Short Circuit, Faults in a power system.
	4	**FAULT CALCULATION:** Symmetrical faults on 3-phase system, Limitation of fault current,Percentage Reactance.
	5	Percentage Reactance and Base KVA, Short circuit KVA, Reactor control of short circuitcurrents, Location of reactors
2nd	1	Steps for symmetrical Fault calculations.
	2	Solve numerical problems on symmetrical fault
	3	Solve numerical problems on symmetrical fault
	4	Solve numerical problems on symmetrical fault
	5	Solve numerical problems on symmetrical fault
3rd	1	Solve numerical problems on symmetrical fault
	2	Solve numerical problems on symmetrical fault
	3	Solve numerical problems on symmetrical fault
	4	**FUSES:** Desirable characteristics of fuse element, Fuse Element materials.
	5	Types of Fuses and important terms used for fuses.
4th	1	Low voltage fuses
	2	High voltage fuses, Current carrying capacity of fuse element.
	3	Difference Between a Fuse and Circuit Breaker.
	4	**Class Test-I**
	5	**CIRCUIT BREAKERS:** Definition and principle of Circuit Breaker. Arc phenomenon and principle of Arc Extinction.
5th	1	Methods of Arc Extinction.
	2	Definitions of Arc voltage, Re-striking voltage and Recovery voltage. Classification of circuit Breakers
	3	Oil circuit Breaker and its classification. Plain brake oil circuit breaker
	4	Arc control oil circuit breaker,
	5	Low oil circuit breaker, Maintenance of oil circuit breaker
6th	1	Air-Blast circuit breaker and its classification
	2	Sulphur Hexa-fluoride (SF6) circuit breaker
	3	Vacuum circuit breakers
	4	Switchgear component. Problems of circuit interruption.
	5	Resistance switching. Circuit Breaker Rating.
7th	1	**Internal Assesment Exam**
	2	**PROTECTIVE RELAYS:** Definition of Protective Relay, Fundamental requirement of protective relay
	3	Basic Relay operation, Electromagnetic Attraction type, Induction type
	4	Definition of following important terms: Pick-up current, current setting, Plug setting Multiplier & Time setting Multiplier
	5	Classification of functional relays, Induction type over current relay (Non-directional)

8th	1	Induction type directional power relay
	2	Induction type directional over current relay
	3	Differential relay: Current differential relay, Voltage balance differential relay
	4	Types of protection
	5	**PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES:** Protection of alternator, Differential protection of alternators, Balanced earth fault protection.
9th	1	Protection systems for transformer, Buchholz relay.
	2	Protection of Bus bar.
	3	Protection of Transmission line.
	4	Different pilot wire protection (Merz-price voltage Balance system)
	5	Explain protection of feeder by over current and earth fault relay.
10th	1	**PROTECTION AGAINST OVER VOLTAGE AND LIGHTNING:** Voltage surge and causes of over voltage.
	2	Internal cause of over voltage, External cause of over voltage (lightning)
	3	Mechanism of lightning discharge
	4	Types of lightning strokes
	5	Harmful effect of lightning
11th	1	Lightning arresters and Type of lightning Arresters, Rod-gap lightning arrester, Horn-gap arrester, Valve type arrester
	2	Surge Absorber
	3	**STATIC RELAY:** Advantage of static relay
	4	Instantaneous over current relay
	5	Principle of IDMT relay
12th	1	**Class Test- II**
	2	Previous Semester Question Discussion
	3	Previous Semester Question Discussion
	4	Previous Semester Question Discussion
	5	Previous Semester Question Discussion

Signature of the
Lecturer

Signature of the
H.O.D.