



Subject: Switchgear and Protective Devices No. of Days/per week class allotted Theory-4  
Tutorial-1  
 Semester From Date : 14.02.2023 To Date : 23.05.2023 No. of Weeks : 15

Date	Topics to be covered as per Lesson Plan	Topics actually covered	Points/contents Discussed (in brief)	Signature of Teacher
14.2.2023	Essential features of Switchgear	Essential features of switchgear	Various features discussed	Boy
16.2.2023	Switchgear equipment.	Switchgear equipment	Switches fuses Circuit breakers Relay	Boy
17.2.2023	Bus Bar Arrangement	Busbar Arrangement	Single bus bar Single bus bar with sectionalisation	Boy
20.2.2023	Switchgear Accommodation	Switchgear Accommodation	Outdoor type Indoor type	Boy
21.2.2023	Tutorial	Tutorial.		Boy
23.2.2023	Short circuit	Short circuit	Defination causes short circuit current	Boy
24.2.2023	Faults in a Power System	Faults in a Power system.	Symmetrical Unsymmetrical	Boy
25.2.2023	Symmetrical faults on 3 $\phi$ system.	Symmetrical faults on 3 $\phi$ system	fault discussed	Boy
27.2.2023	Limitation of fault current	Limitation of fault current	limitation discussed	Boy
28.2.2023	Tutorial	Tutorial.		Boy
2.3.2023	Percentage reactance	Percentage reactance.	Defination and formulae	Boy



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3.3.2023	Percentage reactance and Base kVA	Percentage reactance and Base kVA	Defination formula	Sej
4.3.2023	Short circuit kVA.	Short circuit kVA	formula Numericals	Sej
6.3.2023	Reactor Control of short circuit current	Reactor Control of short circuit current	Reactor Control	Sej
9.3.2023	Tutorial.	Tutorial		Sej
10.3.2023	Location of reactors.	Location of reactors	Generator Reactor, feeder reactor	Sej
11.3.2023	Steps for symmetrical fault calculations	Steps for symmetrical fault calculation	Various Steps discussed	Sej
13.3.2023	Solve numerical problems on symmetrical fault	Solve numerical problems on symmetrical fault	numericals solved	Sej
14.3.2023	Solve numerical problems on symmetrical fault	Solve numerical problems on symmetrical fault	numerical solved	Sej
16.3.2023	Tutorial	Tutorial		Sej
17.3.2023	Desirable characteristics of fuse element	Desirable characteristics of fuse element	Characteristics discussed	Sej
18.3.2023	Fuse element materials.	Fuse element materials	lead, tin, copper, zinc alloys	Sej



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20.3.2023	Types of fuse and important terms used for fuses.	Types of fuse and important terms used for fuses	Low voltage fuse High voltage fuse	SGJ
21.3.2023	Low and high voltage fuses.	Low and high voltage fuses	Low and high voltage fuses.	SGJ
23.3.2023	Tutorial	Tutorial		SGJ
24.3.2023	Current Carrying Capacity of fuse element	Current Carrying Capacity of fuse element	Current carrying capacity	SGJ
25.3.2023	Difference between a fuse and circuit breaker	Difference between a fuse and circuit breaker	Difference discussed	SGJ
27.3.2023	Defn. and Principle of Circuit breaker Arc phenomenon & principle of Arc Extinction.	Defn and principle of CB. Arc phenomenon & principle of Arc extinction	Defination principle phenomenon	SGJ
28.3.2023	Method of Arc Extinction, Defination of Arc voltage, Restraining voltage & Recovery voltage	Method of Arc extinction. Defn of Arc voltage Restraining voltage & recovery voltage	High resistance method Low resistance method	SGJ
31.3.2023	Tutorial.	Tutorial		SGJ
3.4.2023	Classification of circuit breaker, Oil circuit breaker & its operation.	Classification of circuit breaker, Oil circuit breaker & its operation	classification principle & operation	SGJ
4.4.2023	Plane break oil circuit breaker. Arc control oil circuit breaker	Plane break oil CB. Arc control oil CB.	principle construction operation.	SGJ
6.4.2023	Low oil circuit breaker	Low oil circuit breaker	principle construction operation	SGJ



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8.4.2023	Maintenance of oil circuit breakers.	Maintenance of oil circuit breaker	Maintenance	Gay
10.4.2023	Tutorial.	Tutorial		Gay
11.4.2023	Air blast circuit breaker and its application.	Airblast circuit breaker & its application	Principle Construction Application	Gay
13.4.2023	Sulphur Hexafluoride circuit breaker. Vacuum circuit breaker.	SF <sub>6</sub> circuit breaker. Vacuum circuit breakers	Principle Construction	Gay
15.4.2023	Switchgear component. Problems of circuit interruption.	Switchgear component. Problems of circuit interruption	fuses, isolators circuit breaker relay	Gay
17.4.2023	Resistance Switching circuit breakers Rating	Resistance Switching circuit breakers Rating.	Definition short time rating	Gay
18.4.2023	Tutorial	Tutorial.		Gay
20.4.2023	Definition of protective relay. Fundamental requirement of protective relay	Defn. of protective relay. - fundamental requirement of protective relay	Definition requirement	Gay
21.4.2023	Basic Relay operation Electromagnetic Attractive type. Induction type.	Basic Relay operation Electromagnetic Attractive type Induction type	Principle operation	Gay
24.4.2023	Defn. of pickup current, current setting, plug setting, Multiplication & Time setting Multiplier	Defn. of pickup current, current setting, plug setting Multiplier & Time setting multiplier	Definition Formula	Gay
25.4.2023	Classification of fundamental relays, Induction type overcurrent relay (Non-directional)	Classification of fundamental relays. Induction type over current relay (Non-directional)	Principle operation	Gay



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27.4.2023	Tutorial	Tutorial		Bay
28.4.2023	Induction type directional power relay	Induction type directional power relay	Principle operation construction	Bay
29.4.2023	Induction type directional over current relay	Induction type directional over current relay	Principle construction operation	Bay
1.5.2023	Differential relay (i) Current differential relay (ii) voltage balanced differential relay	Differential relay (i) Current differential relay (ii) voltage balanced differential relay	Principle construction	Bay
2.5.2023	Types of Protection	Types of protection	Induction type Distance relay Differential relay	Bay
4.5.2023	Tutorial.	Tutorial		Bay
6.5.2023	Protection of Alternator Differential protection of alternator.	Protection of Alternator Differential protection of alternator	Different method discussed	Bay
8.5.2023	Balanced earth fault protection Protection systems for transformer.	Balanced earth fault. Protection systems for transformer	Definition principle	Bay
9.5.2023	Buchholz relay, Protection of Busbar	Buchholz relay Protection of Busbar	Principle construction	Bay
11.5.2023	Protection of Transmission line	Protection of Transmission line	Protection of To line discussed	Bay
12.5.2023	Tutorial	Tutorial		Bay



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13.5.2023	Differential pilot wire protection (Manspruce voltage balance system)	Differential pilot wire protection (Manspruce voltage balance system)	Principle construction	SGT
20.5.2023	Explosion protection of feeders by overcurrent and earth fault relay.	Explosion protection of feeders by overcurrent & earth fault relay	Principle process discussed	SGT
22.5.2023	Voltage surge & causes of over voltage. Internal causes of over voltage.	Voltage surge & causes of over voltage. Internal causes of over voltage	causes discussed	SGT
23.5.2023	External causes of over voltage (lightning)	External causes of over voltage (lightning)	Causes discussed	SGT
24.5.2023	Mechanism of lightning discharge. Types of lightning strokes	Mechanism of lightning discharge. Types of lightning strokes	Mechanism types discussed	SGT
25.5.2023	Harmful effect of lightning. Lightning arrester & type of lightning arrester	Harmful effect of lightning. Lightning arrester & type of lightning arrester	Harmful effect different types discussed	SGT
26.5.2023	Road gap lightning arrester	Road gap lightning arrester	Principle construction	SGT
27.5.2023	Horn gap arrester voltage type arrester. Surge Absorber	Horn gap arrester voltage type arrester, Surge Absorber	Principle construction	SGT
29.5.2023	Static relay. Instantaneous relay.	Static relay Instantaneous relay	Principle construction	SGT
30.5.2023	Advantages of static relay.	Advantages of static relay	Advantages discussed	SGT
31.5.2023	Instantaneous over current relay. Principle of IDMT relay.	Instantaneous over current relay. Principle of IDMT relay.	Definition principle discussed	SGT