

LESSON PLAN

DEPARTMENT OF ELECTRICAL ENGINEERING, GOVERNMENT POLYTECHNIC BOLANGIR

SUBJECT: SGPD

Periods: 5 per week

SEMESTER: 6th

NAME OF FACULTY: SUJATA BHOI

ACADEMIC YEAR.2021-2022

Semester From date: 10.03.2022

To Date: 10.06.2022

No. of weeks: 15

| Week | Period | Theory / Practical Topics |
|-----------------|-----------------|---|
| 1 st | 1 st | INTRODUCTION TO SWITCHGEAR- Essential Features of switchgear |
| | 2 nd | Switchgear Equipment. |
| | 3 rd | Bus-Bar Arrangement |
| | 4 th | Switchgear Accommodation. |
| | 5 th | Tutorial |
| 2 nd | 1 st | Short Circuit. |
| | 2 nd | Faults in a power system |
| | 3 rd | FAULT CALCULATION- Symmetrical faults on 3-phase system |
| | 4 th | Limitation of fault current. |
| | 5 th | Tutorial |
| 3 rd | 1 st | Percentage Reactance and Base KVA |
| | 2 nd | Short – circuit KVA., Reactor control of short circuit currents. |
| | 3 rd | Location of reactors |
| | 4 th | Steps for symmetrical Fault calculations. |
| | 5 th | Tutorial |
| 4 th | 1 st | Solve numerical problems on symmetrical fault. |
| | 2 nd | Solve numerical problems on symmetrical fault. |
| | 3 rd | Solve numerical problems on symmetrical fault. |
| | 4 th | FUSES- Desirable characteristics of fuse element |
| | 5 th | Tutorial |
| 5 th | 1 st | Fuse Element materials. |
| | 2 nd | Types of Fuses and important terms used for fuses |
| | 3 rd | Low and High voltage fuses |
| | 4 th | Current carrying capacity of fuse element |
| | 5 th | Tutorial |
| 6 th | 1 st | Difference Between a Fuse and Circuit Breaker |
| | 2 nd | CIRCUIT BREAKERS- Definition and principle of Circuit Breaker |
| | 3 rd | Arc phenomenon and principle of Arc Extinction |
| | 4 th | Methods of Arc Extinction. |
| | 5 th | Tutorial |
| 7 th | 1 st | Definitions of Arc voltage, Re-striking voltage and Recovery voltage. |
| | 2 nd | Oil circuit Breaker and its classification. |
| | 3 rd | Plain brake oil circuit breaker., Arc control oil circuit breaker |
| | 4 th | Low oil circuit breaker, Maintenance of oil circuit breaker |
| | 5 th | Tutorial |
| 8 th | 1 st | Air-Blast circuit breaker and its classification |
| | 2 nd | Sulphur Hexa-fluoride (SF6) circuit breaker |
| | 3 rd | Vacuum circuit breakers |
| | 4 th | Switchgear component |

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| | 5 th | Tutorial |
| 9 th | 1 st | Problems of circuit interruption |
| | 2 nd | Resistance switching. |
| | 3 rd | Circuit Breaker Rating |
| | 4 th | PROTECTIVE RELAYS - Definition of Protective Relay |
| | 5 th | Tutorial |
| 10 th | 1 st | Fundamental requirement of protective relay. |
| | 2 nd | basic Relay operation, Electromagnetic Attraction type, Induction type |
| | 3 rd | Pick-up current, Current setting, Plug setting Multiplier, Time setting Multiplier |
| | 4 th | Classification of functional relays |
| | 5 th | Tutorial |
| 11 th | 1 st | Induction type over current relay (Non-directional) |
| | 2 nd | Induction type directional power relay |
| | 3 rd | Induction type directional over current relay |
| | 4 th | Current differential relay, Voltage balance differential relay |
| | 5 th | Tutorial |
| 12 th | 1 st | Types of protection |
| | 2 nd | PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES - Protection of alternator. |
| | 3 rd | Differential protection of alternators, Balanced earth fault protection. |
| | 4 th | Protection systems for transformer, Buchholz relay |
| | 5 th | Tutorial |
| 13 th | 1 st | Protection of Bus bar. Protection of Transmission line. |
| | 2 nd | Different pilot wire protection (Merz-price voltage Balance system) |
| | 3 rd | Explain protection of feeder by over current and earth fault relay |
| | 4 th | PROTECTION AGAINST OVER VOLTAGE AND LIGHTING - Voltage surge and causes of over voltage |
| | 5 th | Tutorial |
| 14 th | 1 st | Internal cause of over voltage, External cause of over voltage (lightning) |
| | 2 nd | Mechanism of lightning discharge. |
| | 3 rd | Types of lightning strokes, Harmful effect of lightning |
| | 4 th | Lightning arresters, Rod-gap lightning arrester. |
| | 5 th | Tutorial |
| 15 th | 1 st | Horn-gap arrester, Valve type arrester |
| | 2 nd | Surge Absorber |
| | 3 rd | STATIC RELAY - Advantage of static relay, Instantaneous over current relay |
| | 4 th | Principle of IDMT relay |
| | 5 th | Tutorial |