| LESSON PLAN | |
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| JHARSUGUDA ENGINEERING SCHOOL,JHARSUGUDA | |
| Name of the Faculty: Soumya Sauraja Panda | Academic Year: 2022-2023 |
| Course No.: TH2 | Course name: Switch Gear and Protective Devices |
| Program: Diploma | Branch:Electrical |
| Year/Sem: 3rd/6th | Section:E2 |

| **Unit** | **Topic to be Covered** | **Teaching Method** | **Time**  **(min)** | **Period** | **Sl. No.** |
| --- | --- | --- | --- | --- | --- |
| 1 | Introduction to switchgear | Black board | 55 min |  |  |
| 1 | Essential features of switchgear | Black board | 55min |  |  |
| 1 | Switchgear equipment | Black board | 55min |  |  |
| 1 | Bus – bar arrangement | Black board | 55min |  |  |
| 1 | Switchgear accommodation | Black board | 55min |  |  |
| 1 | Short circuit | Black board | 55min |  |  |
| 1 | Faults in a power system | Black board | 55min |  |  |
| 2 | Symmetrical faults on 3- phase system | Black board | 55min |  |  |
| 2 | Limitation of fault current | Black board | 55min |  |  |
| 2 | Percentage reactance | Black board | 55min |  |  |
| 2 | Percentage reactance and base KVA | Black board | 55 min |  |  |
| 2 | Short-circuit KVA | Black board | 55 min |  |  |
| 2 | Reactor control of short circuit currents | Black board | 55min |  |  |
| 2 | Location of reactors | Black board | 55 min |  |  |
| 2 | Steps for symmetrical fault calculations | Black board | 55 min |  |  |
| 2 | Numerical problems solving | Black board | 55min |  |  |
| 2 | Numerical problems solving | Black board | 55min |  |  |
| 3 | Desirable characteristics of fuse element | Black board | 55 min |  |  |
| 3 | Fuse element materials | Black board | 55 min |  |  |
| 3 | Types of fuses and important terms used for fuses | Black board | 55 min |  |  |
| 3 | Low and high voltage fuses | Black board | 55 min |  |  |
| 3 | Current carrying capacity of fuse element | Black board | 55min |  |  |
| 3 | Difference between a fuse and circuit breaker | Black board | 55min |  |  |
| 4 | Definition and principle of circuit breaker | Black board | 55 min |  |  |
| 4 | Arc phenomenon and principle of arc extinction | Black board | 55 min |  |  |
| 4 | Methods of arc extinction | Black board | 55 min |  |  |
| 4 | Arc voltage, Re-striking voltage and recovery voltage | Black board | 55 min |  |  |
| 4 | Classification of circuit breakers | Black board | 55 min |  |  |
| 4 | Oil circuit breaker and its classification | Projector | 55 min |  |  |
| 4 | Plain brake oil circuit breaker | Projector | 55 min |  |  |
| 4 | Arc control oil circuit breaker | Projector | 55 min |  |  |
| 4 | Low oil circuit breaker | Projector | 55 min |  |  |
| 4 | Maintenance of oil circuit breaker | Projector | 55 min |  |  |
| 4 | Air blast circuit breaker | Projector | 55 min |  |  |
| 4 | SF6 circuit breaker | Projector | 55 min |  |  |
| 4 | Vacuum circuit breaker | Projector | 55 min |  |  |
| 4 | Switchgear component | Black board | 55 min |  |  |
| 4 | Resistance switching | Black board | 55 min |  |  |
| 5 | Protective relay and it’s requirement | Black board | 55 min |  |  |
| 5 | Basic relay operation and it’s types | Black board | 55 min |  |  |
| 5 | Important terms of relay | Black board | 55 min |  |  |
| 5 | Over current and directional relay | Black board | 55 min |  |  |
| 5 | Differential relay | Black board | 55 min |  |  |
| 5 | Types of protection | Black board | 55 min |  |  |
| 6 | Protection of alternator | Black board | 55 min |  |  |
| 6 | Protection of transformer | Black board | 55 min |  |  |
| 6 | Protection of bus bar | Black board | 55 min |  |  |
| 6 | Protection of transmission line | Black board | 55 min |  |  |
| 6 | Differential pilot wire protection | Black board | 55 min |  |  |
| 7 | Voltage surge and causes of over voltage | Black board | 55 min |  |  |
| 7 | Internal and external cause of over voltage | Black board | 55 min |  |  |
| 7 | Mechanism of lightning arrester | Black board | 55 min |  |  |
| 7 | Types of lightning strokes | Black board | 55 min |  |  |
| 7 | Surge absorber | Black board | 55 min |  |  |
| 7 | Harmful effect of lightning | Black board | 55 min |  |  |
| 8 | Advantage of static relay | Black board | 55 min |  |  |
| 8 | Instantaneous over current relay | Black board | 55 min |  |  |
| 8 | Principle of IDMT relay | Black board | 55 min |  |  |
|  | Revision of all topics | Black board | 55 min |  |  |
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