| DISCIPLINE: Electrical & Electronics Engg. | SEMESTER: 6th Semester | NAME OF THE TEACHING FACULTY: Majji.Lalitha PTGF in EEE |
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| SUBJECT: SWITCH GEAR AND PROTECTIVE DEVICES | NO OF DAYS/PER WEEK CLASSES ALLOTTED:4 | SEMESTER FROM DATE: 22.12.2025 TO DATE: 18.04.2026<br>NO OF WEEKS:15 |

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

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| | 3rd | Switchgear component |
| | 4th | Problems of circuit interruption. |
| | 5th | Resistance switching. |
| 9th | 1st | Circuit Breaker Rating. |
| | 2nd | CLASS TEST |
| | | **5. PROTECTIVE RELAYS** |
| | 3rd | Definition of Protective Relay, Fundamental requirement of protective relay. |
| | 4th | Basic Relay operation , Electromagnetic Attraction type , Induction type |
| | 5th | Definition of following important terms |
| 10TH | 1st | Definition of following important terms, Pick-up current, Current setting. |
| | 2nd | Plug setting Multiplier, Time setting Multiplier. |
| | 3rd | ASSIGNMENT |
| | 4th | Classification of functional relays |
| | 5th | Induction type over current relay (Non-directional). |
| 11th | 1st | Induction type directional power relay. |
| | 2nd | Induction type directional over current relay |
| | 3rd | Differential relay, Current differential relay, Voltage balance differential relay. |
| | 4th | Types of protection |
| | 5th | CLASS TEST |
| | | **6. PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES** |
| 12th | 1st | Protection of alternator. |
| | 2nd | Differential protection of alternators. |
| | 3rd | Balanced earth fault protection, Protection systems for transformer |
| | 4th | Buchholz relay, Protection of Bus bar |
| | 5th | Protection of Transmission line. |
| | 1st | Different pilot wire protection (Merz -price voltage Balance system) |
| 13th | 2nd | Explain protection of feeder by over current and earth fault relay. |
| | 3rd | ASSIGNMENT |
| | | **7. PROTECTION AGAINST OVER VOLTAGE AND LIGHTING** |
| | 4th | Voltage surge and causes of over voltage. |
| | 5th | Internal cause of over voltage. |
| | 1st | External cause of over voltage (lighting) |
| 14th | 2nd | Mechanism of lightning discharge. |
| | 3rd | Types of lightning strokes, Harmful effect of lightning |
| | 4th | Lightning arresters and Type of lightning Arresters, Rod-gap lightning arrester, Horn-gap arrester, Valve type arrester. |
| | 5th | Surge Absorber. |
| 15th | 1st | ASSIGNMENT |
| | | **8. STATIC RELAY** |
| | 2nd | Advantage of static relay. |
| | 3rd | Instantaneous over current relay |
| | 4th | Principle of IDMT relay. |
| | 5th | ASSIGNMENT |

Lecturer 22.12.25

HOD 22.12.25

Principal