

SWITCHGEAR AND PROTECTION

BRANCH:- EE /EEE

SEMESTER – THIRD

These important questions have been prepared using your previous exam papers (PYQs), verified concepts, and additional reference from trusted online academic sources. For deeper understanding, please refer to your class notes as well.

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1 HIGH & LONG IMPORTANT QUESTIONS

1. Substation Earthing & Protection

- Explain the necessity and **importance of Neutral Earthing**.
- Describe the working principle, advantages, and construction features of **Solid Earthing, Resistance Earthing, and Reactance Earthing**.
- Explain the **Principle and applications of the Peterson Coil**.

2. High Voltage Circuit Breakers

- Describe the **construction and detailed working principle** of an **SF6 Circuit Breaker**.
- Explain the terminologies: **Recovery Voltage, Transient Recovery Voltage (TRV), and Rate of Rise of Restriking Voltage (RRRV)**.

3. Control Panel Comprehensive Design

- Explain the **meaning, types, and construction** of a typical **Low Voltage (LV) power distribution panel**.
- Describe the function and importance of all major sections: **Incoming section, Outgoing section, and Busbar section**.

4. Transformer Protection Schemes

- Explain the construction and detailed working of the **Circulating Current Scheme for Transformer Protection**.
- Describe the construction, working, and application of the **Buchholz Relay**.

5. Electromechanical Relays

- Explain the **construction and working principle** of the **Induction type Electro-mechanical Over Current Relay**.
- List and explain the different **Testing Methods for Relays**.

6. Automatic Panels

- Explain the **construction, working principle, and sequence of operation** of either the **Automatic Power Factor Control (APFC) panel** or the **Automatic Mains Failure (AMF) panel**.

2 IMPORTANT & SHORT QUESTIONS

1. Define and explain the significance of the following terms: **Fusing Factor, Cut-off Current, Prospective Current, and Total Break Time**.
2. Explain the detailed procedure for the **Installation, operation, and preventive maintenance of an SF6 circuit breaker**.
3. Explain the complete steps involved in the **dis-assembly, preventive maintenance, servicing, and assembly of a power contactor**.
4. Explain the procedure for setting the **pick-up current and Time Setting Multiplier (TSM)** for an induction type relay operation.
5. Explain the procedural steps for conducting the **Insulation Test and Logic Tests** on a Low Voltage Control Panel.
6. Explain the construction and working principle of **Balanced Earth Fault Protection for Alternators**.

3 “AA BHI SAKTA HAI” QUESTIONS (Low probability but smart picks)

1. Explain the **Block diagram and working** of a **Microprocessor/Microcontroller based Overcurrent Relay**. Briefly explain the steps to **Program and test a Numerical Over Current/Earth Fault Relay**.
2. Explain the typical specification and working principle of: (a) **Thermal Overload Relays (OLR)** and (b) **Bimetal Relays** (Direct / CT operated).
3. Explain the significance of **IEC 61439 standards** and the function of any four common **ANSI Device numbers**. State the function of the **TCS (Trip Circuit Supervision relay)**.
4. Explain the working and application of the **Trivector meter** and a **Multi-function meter**. Explain the significance and importance of **Interlocking operation**.
5. Explain the construction and working of **Differential Protection of Bus-Bars**. Discuss the basic principle of **Distance Protection**.
6. Explain the complete procedure for **Testing an HRC fuse by performing a Load test**.