

22633

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

10

- (a) Classify substations based on constructional features.
- (b) Write any four advantages of neutral grounding.
- (c) State function of CT and PT in 33/11 kV substation.
- (d) Write any four needs of 132 kV/33 kV substation.
- (e) Suggest the suitable method of neutral grounding in 132 kV/33 kV substation with its any two specific reasons.
- (f) Enlist any four advantages of Gas Insulated Substation (GIS).
- (g) Illustrate application of high speed Earthing Switch in Gas Insulated Substation (GIS).

- 2. Attempt any THREE of the following :** **12**
- (a) Draw symbols of Relay, Bus-bar, CT and PT used in single line diagram.
 - (b) Draw the layout of a pole mounted 11 kV/400 V substation and enlist any eight equipments of it.
 - (c) List out any eight routine maintenance activities in 33 kV/11 kV substation.
 - (d) Illustrate any eight reasons of major fire risks within 132 kV/33 kV substation.
- 3. Attempt any THREE of the following :** **12**
- (a) State purpose of circuit breaker, isolator and earthing switch. Explain their operational co-ordination in substation.
 - (b) Draw and explain working diagram of Earth Tester.
 - (c) Draw schematic (single line) diagram of a 33 kV/11 kV substation and enlist any eight equipments of it.
 - (d) Define the terms Touch Potential, Step Potential, Mesh Potential and Transferred Potential in associated with substation.
- 4. Attempt any THREE of the following :** **12**
- (a) State the function and rating of
 - (i) AB switch
 - (ii) CT
 - (iii) PT
 - (iv) DO for 11 kV substation
 - (b) Enlist any eight routine tests to be carried out on 11 kV / 400 V distribution transformer.
 - (c) Illustrate standard procedure to be carried out of Break Down Voltage (BDV) test on power transformer oil.

- (d) Explain operation of circuit breaker and disconnecting switch in Gas Insulated Substation (GIS).
- (e) Distinguish between Air Insulated Substation (AIS) and Gas Insulated Substation (GIS).

5. Attempt any TWO of the following :

12

- (a) Write any six precautions to be taken while maintaining 11 kV/400 V distribution transformer.
- (b) Suggest any six preventive maintenance activities for
 - (i) Circuit breaker
 - (ii) Isolator in 33 kV substation
- (c) Explain with neat sketch functioning of
 - (i) Wave trap
 - (ii) PLCC

6. Attempt any TWO of the following :

12

- (a) Illustrate need of (i) Station Transformer (ii) Battery charging unit and (iii) Capacitor bank in a 33 kV/11 kV substation.
 - (b) Draw and explain single line diagram of 132 kV/33 kV substation indicating major equipments.
 - (c) Illustrate visual, minor and major maintenance plan of Gas Insulated Substation (GIS).
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