

22633

22232

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Figures to the right indicate full marks.
 - (4) 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) State the value of Earth Resistance as per IE Rule for :
 - (1) 11 kV substation (small)
 - (2) Powerstation (32, 220 kV)
- (b) State the need of 33/11 kV substation.
- (c) List any two safety rules followed during breakdown maintenance on 11 kV sub-station.
- (d) State any one type of battery trouble, its cause, maintenance, remedy to be taken.
- (e) State the type of LA used for 132 kV / 33 kV sub-station. Give its rating.
- (f) Name the material used in a firefighting equipment for GIS.
- (g) List any two properties of the SF₆ gas used in GIS.



- 2. Attempt any THREE of the following : 12**
- (a) Explain any four factors to decide the selection of site for the sub-station.
 - (b) Draw a neat sketch of 11 kV/400 V, 250 kVA pole mounted sub-station. State function of each part.
 - (c) Describe the procedure to locate and record the hot spots in a 132 kV/33 kV sub-station.
 - (d) Compare equipment earthing and system earthing on any four points.
- 3. Attempt any THREE of the following : 12**
- (a) List any four safety rules to be followed while working in a sub-station.
 - (b) With a neat sketch explain any one method to measure insulation resistance in 11 kV substation.
 - (c) Explain any four firefighting equipment used in a 33 kV sub-station.
 - (d) Illustrate with relevant figures the following :
 - (i) Touch potential
 - (ii) Make potential
 - (iii) Transfer potential
- 4. Attempt any THREE of the following : 12**
- (a) Explain the procedure to be followed for shut down of 11 kV substation and power lines.
 - (b) State the purpose and location of following in 33 kV/11 kV sub-station –
 - (i) Capacitor bank (ii) Relay panel (iii) Battery charging unit (iv) SCADA
 - (c) Explain partial discharge & describe the method of monitoring it.
 - (d) Explain maintenance schedule of GIS substation.
 - (e) Sketch the following layout Diagrams in 11 kV substation
 - (1) Floor mounted
 - (2) Pole mounted

5. Attempt any TWO of the following :**12**

- (a) Prepare a tabular form to show maintenance schedule of a power transformer above 1000 kVA capacity.
- (b) Give rating and type of following components used in pole mounted sub-station of your institute campus.

3 ϕ transformer, CT, PT, LA, DO, CB

- (c) Illustrate with a neat sketch the Dielectric test cell with proper explanation.

6. Attempt any TWO of the following :**12**

- (a) Explain Partial-discharge phenomenon in detail.
 - (b) Describe the following used in 33 kV substation
 - (1) Capacitor bank
 - (2) CB and voltage transformer
 - (c) State the function of the following in 132 kV/33 kV sub-station CVT, HT fuse, Wave trap, PLCC, Insulator, Isolator.
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