22633

24225

3 Hours / 70 Marks Seat No. | | | | | | | | |

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) State the typical earth resistance values of 11,33,132 and 400 kV substation.

(b) State the functions of three phase distribution transformer.

(c) State function of CT and PT in 33/11 kV substation.

(d) Write any four needs of 132 kV/33 kV substation.

(e) List the material used to enhance earthing resistance in rocky land.

(f) List any two properties of the SF6 gas used in GIS.

(g) Illustrate application of high speed Earthing Switch in Gas Insulated Substation (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) List out any eight routine maintenance activities in 11 kV/400 V substation.

(c) Distinguish between System Earthing and Equipment Earthing.

(d) Illustrate any eight reasons of major fire risks within 132 kV/33 kV substation.

3. Attempt any THREE of the following : **12**

(a) Describe general safety rules to be followed to minimize the risk of electrical hazards in substation.

(b) Draw neat labelled single line diagram of pole mounted substation, state the function of protective devices used for protection.

(c) State the procedure followed to undertake breakdown maintenance of dry type power transformer.

(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) Illustrate the standard procedure to measure insulation resistance for pole mounted substation.

(b) State the function and rating of

(i) 3 phase distribution transformer

(ii) Lightning Arrester

(iii) Bus bar

(iv) DO fuse for 11 kV substation

(c) Draw schematic (single line) diagram of a 33 kV/11 kV substation and enlist any eight equipments of it.

(d) Define partial discharge and explain its effect on performance of 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) With neat labelled diagram, illustrate standard procedure to be carried out of Break Down Voltage (BDV) test on power transformer oil.

(c) Describe the causes of hot spot formation in transformer and state the methods of identification.

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) Explain with neat sketch functioning of (i) Wave trap (ii) PLCC

(c) Draw single line diagram of 132 kV GIS substation and write advantages and disadvantages of GIS over conventional substation.