

22633

21222R

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) 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) Draw symbol used in single line diagram for following circuit element.
 - i) Three - phase power transformer.
 - ii) Oil circuit breaker.
 - b) State the need of plinth mounted substation.
 - c) List two purposes of earthing.
 - d) State the function of CVT.
 - e) Write two advantages of Gas Insulated Substation (GIS)
 - f) Write the name of any four protective devices used in 132kv/33 kv substation.
 - g) List out any four Personal Protective equipment (PPE) used while entering in the substation.

P.T.O.

2. Attempt any THREE of the following: 12
- Distinguish between indoor substation and outdoor substation (any four points).
 - Draw layout diagram of pole mounted substation and label it.
 - Explain safety practices followed during routine and breakdown maintenances of 33kv/11kv substation.
 - Draw single line diagram of 132kv/33kv substation and label it.
3. Attempt any THREE of the following: 12
- List any four safety rules used to minimize the risk of electrical hazards in substation.
 - Explain the methods of improving the earth resistance.
 - Explain the function of station transformer and capacitor bank in case of 33kv/11kv substation.
 - Define Gas insulated substation and explain need of it.
4. Attempt any THREE of the following: 12
- Draw neat labeled single line diagram of 33kv/11kv substation.
 - Explain the precautions taken while carrying out maintenance work of lightning arrester and air break switch.
 - Explain the need of 132kv/33kv substation.
 - Explain the function of power line carrier communication (PLCC) and circuit breaker in 132kv substation.
 - List four drawbacks of Gas insulated substation.
5. Attempt any TWO of the following: 12
- Define earthing with diagram. Differentiate between equipment earthing and system earthing.
 - Elaborate the causes of fire in gas insulated substation and list fire fighting equipments mainly used based on the reason of fire.
 - State the importance of break down voltage test on power transformer. Explain the procedure to perform break down voltage test of transformer oil.

6. Attempt any TWO of the following:

- a)
 - i) List any six substation equipments used in 11kv/440v substation.
 - ii) State any three safety practices followed during maintenance in 11kv substation.
 - b) List the various causes of fire in 33kv/11kv substation
Explain any two fire fighting equipments used in 33kv/11kv substation.
 - c)
 - i) Explain touch potential and mesh potential.
 - ii) Describe procedure to locate hot spot formation in substation.
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