

22419

24225

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) 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 function of
 - i) Cross arm
 - ii) Jumper
 - b) Draw the equivalent circuit diagram of medium transmission line using nominal 'T' method.
 - c) State the necessity of transposition of conductors in transmission system.
 - d) State advantage and disadvantage of the phenomenon "Corona effect" (any one each).
 - e) Define :
 - i) Feeder
 - ii) Distributor

P.T.O.

- f) Draw the symbols of
 - i) Double break isolating switch
 - ii) Air blast circuit breaker
- g) State the trade name and rating of ACSR conductors.

2. Attempt any THREE of the following : 12

- a) Give the classification of transmission line
 - i) according to length of transmission line and state its length and voltage range.
 - ii) according to voltage level and state its voltage level.
- b) Explain the Proximity effect in detail.
- c) Give the classification of types of FACTS controllers in detail.
- d) Explain the construction of under ground cable in detail with diagram.

3. Attempt any THREE of the following : 12

- a) Draw the single line diagram of electrical transmission and distribution system.
- b) Explain Bipolar HVDC transmission system with a neat diagram.
- c) Compare Indoor and Outdoor substations.
- d) Explain the causes of failure of line insulators.

4. Attempt any THREE of the following : 12

- a) Explain the method of construction of 220 kV transmission system.
- b) Explain skin effect and state the factors on which skin effect depends.
- c) Explain the methods used for reducing corona effect of EHVAC transmission line.
- d) Explain interconnected distribution system in detail.
- e) Explain different steel towers used for overhead transmission system.

5. Attempt any TWO of the following : 12

- a) A lph 11KV system with a length of 15kM is to transmit 500KVA. The inductive reactance of the line is $0.5\Omega/\text{KM}$ and resistance $0.3\Omega/\text{KM}$. Calculate the efficiency and regulation of the line for 0.8 lagging power factor. Draw vector diagram.
- b) Compare EHVAC and HVDC transmission system.
- c) Draw the single line diagram of 33/11KV substation.

6. Attempt any TWO of the following : 12

- a) Explain the effect of different power factor on voltage regulation and efficiency of short transmission line with phasor diagram.
 - b) A single phase AC distributor 2KM long supplies a load of 120A at 0.8 p.f lagging at its far end and a load of 80A at 0.95 p.f lagging at its mid point. Both power factors are referred to the voltage at the far end. The resistance and reactance per KM (go and return) are 0.05Ω and 0.1Ω respectively. If the voltage at the far end is maintained at 230V, Calculate :
 - i) Voltage at the sending end
 - ii) Phase angle between voltages at the two ends.
 - c) A 3ϕ over head transmission supported by 6 disc insulators. The potential across each unit is 11KV. Assuming the shunt capacitance between each insulator and metal link is of $1/5^{\text{th}}$ of capacitance of insulator disc, Calculate
 - i) line voltage
 - ii) storing efficiency
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