17417

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any THREE of the following:** **12**

(i) Draw a block diagram of power system. State the function of each block.

(ii) State the meaning of ACSR conductors. State its advantages.

(iii) Describe skin effect.

(iv) State the necessity and importance of EHV transmission.

b) **Attempt any ONE of the following:** **6**

(i) Compare copper and Aluminium on any six points.

(ii) A 11 kV, 3 - Phase transmission line has a resistance of 1.5 ohm and reactance of 4 ohm/phase. Calculate the percentage regulation and efficiency of the line when total load of 5000 kVA at 0.8 p.f. lagging is supplied at 11 kV at the distance end.

Marks

2. Attempt any FOUR of the following: **16**

a) Give the comparison between primary transmission and secondary transmission system.

b) Compare overhead line and underground cable.

c) Describe the Ferranti effect with the help of neat phasor diagram.

d) Define efficiency and regulation of transmission line.

e) Draw a block diagram of HVDC transmission. State the function of each block.

3. Attempt any TWO of the following: **16**

a) Describe the construction of cable with well labelled diagram.

b) (i) Compare Nominal - T and Nominal - π method of medium transmission line.

(ii) State the effect of load power factor on performance of transmission line.

c) (i) State the requirements of an ideal distribution system.

(ii) State the controlling factors in determining the size of a distributor.

4. a) Attempt any THREE of the following: **12**

(i) Give the classification of transmission line according to:

1) Voltage level

2) Length of transmission line

3) Types of supply voltage and

4) Method of construction

(ii) Draw the short transmission line representation and its vector diagram and write the expression for V_S from the phasor diagram. Also write the expression for percentage voltage regulation and transmission efficiency.

(iii) Compare EHVAC and HVDC transmission line.

(iv) State the components of distribution system.

Marks

b) **Attempt any ONE of the following:** **6**

(i) Describe the phenomenon of corona. Discuss about corona formation. State the advantages and disadvantages of corona.

(ii) Classify substation on the basis of:

1) Service requirement

2) Constructional features

5. Attempt any FOUR of the following: **16**

a) State different types of line insulators. Describe any one of them.

b) Define transposition of conductors. State why transmission line conductors are transposed.

c) A 1 - phase transmission line is delivering 500 kVA load at 2 kV. It's resistance is 0.2 Ω and inductive reactance is 0.4 Ω. Determine voltage regulation, if the load power factor is 0.707 leading.

d) Compare AC distribution and DC distribution system.

e) Compare Indoor and outdoor substation on the basis of:

(i) Space required for substation

(ii) Time required for erection

(iii) Fault location

(iv) Capital cost

Marks

6. Attempt any TWO of the following: **16**

a) State the concept of string efficiency. Describe the different methods to improve string efficiency.

b) (i) Write down sending end voltage, sending end current by using generalised circuit constants of transmission line. Mention the important points about it.

(ii) Draw a typical layout diagram of 11 kV distribution substation.

c) A single phase A.C. distributor AB 300 meters long is fed from end A and loaded as under:

(i) 100 A at 0.707 p.f. lagging 200 m from point A.

(ii) 200 A at 0.8 p.f. lagging 300 m from point A.

The load resistance and reactance's of distributor is 0.2 Ω and 0.1 Ω per kilometer. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.