

313333

25226

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) Name any two thermal power station in Maharashtra with installed capacity.
- (b) Define the terms :
 - (i) Spinning reserve
 - (ii) Connected load
- (c) Name the standard voltages for primary transmission and secondary transmission.
- (d) List types of transmission line supports.
- (e) State any two routes of EHVAC transmission line in India.
- (f) List types of distribution line schemes.
- (g) Write the function of :
 - (i) Circuit breaker
 - (ii) Drop Out (DO) fuse in distribution substation.



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

- (a) Draw a typical layout of pumped storage Hydro power plant and label following parts :

- (i) Penstock (ii) Tail race
(iii) Turbine (iv) Pressure channel

- (b) Define the terms :

- (i) Base load plant (ii) Peak load plant
(iii) Plant capacity factor (iv) Plant load factor

- (c) A single phase 11 kV overhead line of 30 km length delivers about 1100 kW of power with 0.8 pf lagging. The resistance of line is 10 ohm and reactance is 15 ohm.

Determine :

- (i) Sending end voltage (ii) Line losses
(iii) Efficiency (iv) Percentage voltage regulation
- (d) Explain the Ferranti effect in HV transmission line with circuit diagram and vector diagram.

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

- (a) Explain any four factors to be considered in selection of site for thermal power plant.
- (b) A power station has the following daily load cycle :

Time (Hrs.)	6 – 8	8 – 12	12 – 16	16 – 20	20 – 24	24 – 6
Load (MW)	20	40	60	20	50	20

Draw the load curve and calculate :

- (i) Maximum demand
(ii) Average load
(iii) Units generated per day

- (c) State any four features of High Temperature Low Sag (HTLS) conductors used in high voltage transmission line.
- (d) Draw a single line layout diagram of 33 kV/11 kV distribution substation and label the parts :
 - (i) Transformer
 - (ii) Isolator
 - (iii) Circuit breaker
 - (iv) Lightning Arrester

4. Attempt any THREE of the following :

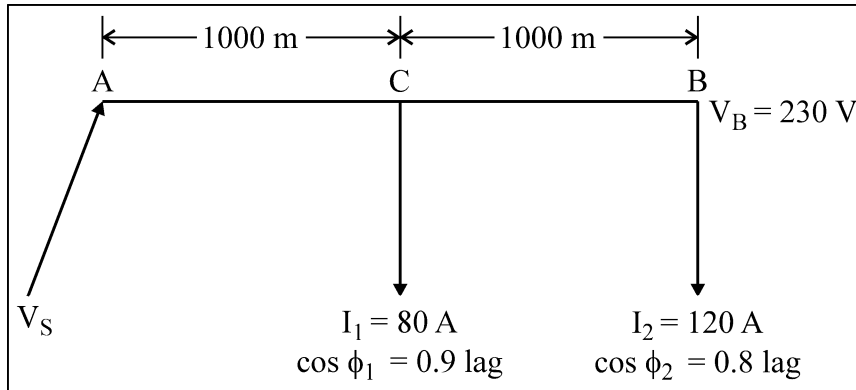
12

- (a) Draw a neat diagram of thermal power plant and state the function of :
 - (i) Super heater
 - (ii) Air preheater
- (b) Explain the State grid and National grid concept and state difference between brownout and blackout faults.
- (c) Compare EHVAC and HVDC transmission line on basis of :
 - (i) Voltage level used
 - (ii) Line losses
 - (iii) Substation equipments
 - (iv) Initial cost
- (d) Explain working of Run off river power plant with pondage with a neat diagram.
- (e) Differentiate between outdoor substation and indoor substation on basis of :
 - (i) Fault detection
 - (ii) Repair and maintenance cost
 - (iii) Voltage level
 - (iv) Erection cost

P.T.O.

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

- (a) State the need of transposition of overhead line conductors with a neat diagram.
- (b) A single phase distributor of 2 km length has total impedance of $[0.1 + j0.2 \Omega]$. It is fed from point 'A' at certain voltage. The distributor is loaded as shown in figure no. 1.

**Fig. No. 1**

Calculate :

- (i) Voltage drop
- (ii) Sending end voltage $[V_S]$

Take voltage at far end $[V_B]$ as 230 volt.

- (c) Explain the concept of wireless transmission of electrical power and list any two advantages of it.

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

- (a) Write any six safe practices to be followed in hydro power plant.
- (b) Draw circuit diagram and phasor diagram of Nominal ' π ' method to represent medium transmission line.
- (c) Give classification of distribution substation on basis of :
- (i) Service requirement
- (ii) Constructional features

Write one application of each substation.
