

17324

**11920**

**3 Hours / 100 Marks**

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any TEN of the following :**

**20**

- (a) State the average calorific value of :
  - (i) Solid fuel (coal)
  - (ii) Liquid fuel (oil)
- (b) State the function of Superheater and Reheater in steam power plant.
- (c) State any two thermal power station in Maharashtra with their capacity in MW.
- (d) Define the term :
  - (i) Hydrology
  - (ii) Precipitation

- (e) Classify the Hydro Electric Power Plants on the basis of Water Flow regulation available.
- (f) List any two nuclear power stations in India with their capacity in MW.
- (g) State the Nuclear fuels used in Nuclear Power Plants.
- (h) Define the term multiplication factor or Reproduction Factor related to Chain Reaction of Nuclear fission.
- (i) State any two applications of Diesel Power Plants.
- (j) State any two disadvantages of Diesel Electric Power Plant.
- (k) Define the terms used in system operation :
  - (i) Firm Power
  - (ii) Hot Reserve
- (l) Define the term :
  - (i) Plant capacity factor
  - (ii) Plant use factor

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

**16**

- (a) Give the present power generation contribution by different type of power plants in India. State the reasons of power crisis in India.
- (b) Draw the schematic block diagram of coal fired power Station.
- (c) State the factors governing selection of site for Thermal Power station.
- (d) Describe with suitable diagram; the various stages in coal handling plant.
- (e) Describe with line sketch; the working of Electrostatic precipitator. State its advantages over other type of Dust collectors.
- (f) Describe the salient features of alternators used in Hydroelectric power plant.

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

- (a) Describe the function of Economizer and necessity of heating and purifying the water before feeding to the boiler.
- (b) Draw the schematic arrangement of Hydroelectric power plant.
- (c) State the factors to be considered for the selection of site for Hydro electric power plant.
- (d) Describe the procedure of Nuclear waste disposal.
- (e) Describe with diagram, constructional features and operation of Fast Breeder Reactor (FBR).
- (f) State the Necessity advantages and disadvantages of Captive Power Generation.

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

- (a) Describe with neat sketch; the working of spray pond in steam power plant.
- (b) 'Thermal power plants are not suitable for supplying fluctuating loads'. Justify the statement.
- (c) Describe with neat diagram; the working of pumped storage power plants.
- (d) Describe with neat sketch; the layout of a medium size Diesel Electric Power plant.
- (e) Describe Fuel system and Air Intake system related to Diesel Electric Power Plant.
- (f) A proposed generating station has the following daily load cycle :

<b>Time (Hours)</b>	0 – 8	8 – 11	11 – 16	16 – 19	19 – 22	22 – 24
<b>Load (MW)</b>	20	40	50	35	70	40

Draw the load curve and load duration curve and select suitable generating units.

**P.T.O.**

- 5. Attempt any FOUR of the following :** **16**
- (a) State the factors to be considered for the selection of water turbine in Hydroelectric power station. Compare Kaplan and Francis turbines. (Any three points of comparison)
  - (b) Draw schematic arrangement of typical Nuclear power plant.
  - (c) Describe with neat diagram; main parts of Nuclear Reactor and their function.
  - (d) Compare Nuclear Power station with Hydro power station. (Any four points)
  - (e) Compare flat plate collectors and concentrating type collectors.
  - (f) Draw block diagram showing basic wind energy conversion system and state the function of each block.
- 6. Attempt any FOUR of the following :** **16**
- (a) Describe with neat sketch; the operation of Pressurized Water Reactor (PWR).
  - (b) A generating station has a maximum demand of 40 MW; a load factor of 60%; a plant capacity factor of 50% and a plant use factor of 72%  
Determine :
    - (i) The Reserve capacity of the plant. **1**
    - (ii) Daily energy produced **1**
    - (iii) Maximum Energy that could be produced daily if the plant were fully loaded. **2**
  - (c) Describe base load and peak load on power station. State the requirements of power station supplying the base load.
  - (d) Describe the functional block diagram of photovoltaic power generating system.
  - (e) Draw schematic diagram of Solar Thermal Power Plant. State its advantages.
  - (f) State the factors that are taken into consideration in the site selection for a wind plant.
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