



# 17324

16117

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**

- List any four sources of energy.
- Name any two thermal power station in Maharashtra State with their installed capacity.
- State any two salient features of turbo alternator.
- State the purpose of surge tank and spill way in hydroelectric power station.
- Classify hydropower plant on the basis of availability of water head.
- State any two fuels used in nuclear power station.
- State the purpose of moderator in a nuclear power plant.
- State location of any four nuclear plants in India.
- Give the classification of diesel engines.
- State any two applications of diesel power plants.
- Define state grid and national grid.
- Define diversity factor of power plant.

**P.T.O.**



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

16

- a) Compare conventional energy sources with non-conventional energy sources (any four points).
- b) Draw a neat layout of thermal power station and label it.
- c) State the function of cooling tower and condenser in thermal power station.
- d) State the various factors governing selection of site for thermal power station.
- e) Define the terms :
  - i) Hydrology
  - ii) Surface Runoff
  - iii) Evaporation
  - iv) Precipitation.
- f) State the advantages and disadvantages of hydro electric power plant.

3. Attempt **any four** of the following :

16

- a) State the different types of fuels with two examples of each. State the advantages and disadvantages of these fuels.
- b) Draw a neat labelled sketch of water tube boiler and also State its two advantages over fire tube boiler.
- c) Write the purpose of coal and ash handling unit. Also write different activities that are carried out in this unit.
- d) State the functions of the following parts of hydro electric power station :
  - i) Reservoir
  - ii) Penstock
  - iii) Tailrace
  - iv) Turbine
- e) Define the terms nuclear fission and chain reaction as referred to nuclear power station.
- f) State why nuclear power plants are used as base load plants and diesel power plants as a peak load plant. (Give two reasons).

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

- a) Compare jet condenser with surface condensers for initial cost, maintenance cost and space required for condensation.
- b) Explain the working of pumped storage plants.
- c) State any four advantages and any four disadvantages of diesel electric power plant.
- d) State the functions of fuel system and exhaust system of a diesel power station.
- e) List and state any four limitations of inter connected power station.
- f) A generating station has the following daily load cycle.

**Time (hours) :** 0-6    6-10    10-12    12-16    16-20    20-24

**Load (MW) :** 40    50    60    50    70    40

Draw the load curve and find :

- i) Maximum demand
- ii) Units generated per day
- iii) Average load and
- iv) Load factor.

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

- a) “Hydro electric power station are not perennial power station”. Justify.
- b) Explain the working of nuclear power plant with the help of neat sketch.
- c) Explain the purpose of shielding and reflector in a nuclear reactor.
- d) State any four advantages of nuclear power station.
- e) With a neat block diagram state the process of converting solar energy into electric energy. Draw the diagram showing the element of such a plant.
- f) Explain the importance of solar power in the energy deficient India.



6. Attempt **any four** of the following :

- a) State the types of radioactive waste generated in a nuclear power station. Explain the methods employed for their disposal.
  - b) Define :
    - i) Maximum demand
    - ii) Average demand
    - iii) Plant capacity factor
    - iv) Plant use factor.
  - c) State with a neat diagram the working of photovoltaic cell.
  - d) Draw wind power plant diagram and show main components of wind power plants.
  - e) Classify the solar collectors and compare them.
  - f) Define solar constant. Draw the schematic representation of distribution of solar energy as direct, diffused and total radiation.
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