

22566

11920

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 four types of power plant.
- (b) State the two types of FBC boiler.
- (c) State any four advantages of steam power plant.
- (d) State the necessity of waste heat recovery in thermal power plant.
- (e) Enlist any four nuclear fuel.
- (f) Define :
  - (i) Fixed Cost
  - (ii) Depreciation Cost
- (g) State any four limitations of diesel power plant.

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

**12**

- (a) Classify hydroelectric power plant.
- (b) Explain the maintenance procedure of major components of high pressure boiler.
- (c) Draw a layout of solid fuel (coal) handling system used in steam power plant.
- (d) Explain working principle of co-generation with neat sketch.

- 3. Attempt any THREE of the following :** **12**
- (a) Draw typical layout of diesel engine power plant showing all system.
  - (b) State any four advantages of gas turbine power plant over steam power plant.
  - (c) Explain the concept of Trigeration and enlist the opportunities in thermal power plant.
  - (d) Explain with neat sketch operating principle of Nuclear power plant.
- 4. Attempt any THREE of the following :** **12**
- (a) Explain with neat sketch operating principle of hydroelectric power plant.
  - (b) State any four advantages and limitations of nuclear power plant.
  - (c) List the factors to be considered while choosing the type of power plant.
  - (d) Explain world and national scenario of demand and supply of energy.
  - (e) A power station has two 60 MW units each running for 7000 hours a year and one 30 MW unit running for 1500 hours a year. The energy produced per year is  $700 \times 10^6$  kWh.  
Calculate : (i) Plant load factor  
(ii) Plant use factor
- 5. Attempt any TWO of the following :** **12**
- (a) Explain with neat sketch construction and working of Lamont boiler.
  - (b) Explain with neat sketch intercooling method used to improve the thermal efficiency of a open cycle gas turbine plant.
  - (c) Explain with neat sketch Pressurised Water Reactor (PWR).
- 6. Attempt any TWO of the following :** **12**
- (a) Explain with neat sketch working principle of Fluidized Bed Combustion (FBC) boiler.
  - (b) Draw schematic diagram of boiler feed water control system. State its importance in thermal power plant.
  - (c) A 60 MW power station has an annual peak load of 50 MW. The power station supplies loads having maximum demands of 20 MW, 17 MW, 10 MW and 9 MW. The annual load factor is 0.45.  
Find : (i) Average load  
(ii) Demand factor  
(iii) Diversity factor
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