21222

3 Hours / 70 Marks   Seat No.

15 minutes extra for each hour

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.

Marks

1.   **Attempt ANY FIVE of the following :**   **10**

(a)   Define enthalpy and state its unit.

(b)   Define :

(i)   Superheated steam

(ii)   Wet steam

(c)   State the use of piston in I.C. Engine.

(d)   Define :

(i)   Degree of superheat

(ii)   Dryness fraction

(e)   State the function of the turbine and list any two applications.

(f)   What did you understand by the term "Ton of refrigeration." ?

(g)   State the function of evaporator and condenser in refrigerator.

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

(a)   Differentiate between boiler mountings and boiler accessories.

(b)   State the necessity of compounding the steam turbine.

(c)   Draw the neat sketch of Cochran boiler.

(d)   Draw the layout of steam power plant and state the function of any two major components.

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

   (a)   Define the terms :

      (i)   Indicated power

      (ii)   Brake power

      (iii) Brake thermal efficiency

   (b)   Explain the working of 4 stroke diesel engine with neat sketch.

   (c)   Mention any two faults and its remedies regarding. I.C. engine with its justifications.

   (d)   State the working principle of Pelton turbine giving two applications.

4. **Attempt ANY THREE of the following :** **12**

   (a)   Differentiate between centrifugal compressor and reciprocating compressor.

   (b)   List any four applications of compressed air.

   (c)   Draw the neat sketch of screw compressor and label it.

   (d)   Name the hazardous pollutants in a steam power plant with their effect on human body.

   (e)   Mention the corrective action to reduce the electricity bill due to air compressor.

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

   (a)   Explain centrifugal pump with its neat sketch and constructional features.

   (b)   Describe Francis Turbine with its neat sketch. Also mention any two applications of Francis Turbine.

   (c)   Explain window air conditioning system with neat sketch.

6. **Attempt ANY TWO of the following :** **2 × 6 = 12**

   (a)   Add a short note on methods of energy savings in refrigeration and air conditioning system.

   (b)   Explain the working principle and state any two applications of the following :

      (i)   Reciprocating pump

      (ii)   Rotary pump

   (c)   Differentiate between impulse turbine and reaction turbine.

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