

22214

**11920**

**3 Hours / 70 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.

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

**Marks**

**10**

- (a) Define enthalpy and state its SI unit.
- (b) State the application of Nozzle.
- (c) Enlist the parts of centrifugal pump.
- (d) If engine do not start in colder condition identify its causes.
- (e) Define one ton of refrigeration.
- (f) Identify the component of domestic refrigerator.
- (g) Define pressure and state its SI units.

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

**12**

- (a) Describe the functions of three parts of Babcock and Wilcox boiler using a sketch.
- (b) Draw the sketch of Impulse steam turbine and do the following :
  - (i) Label the components
  - (ii) Describe the functions of any two major components.

- (c) Describe the working of four stroke diesel engine with sketch ?
- (d) Name the hazardous pollutants in a steam power plant with their effect on human.

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

**12**

- (a) Suggest with justification the remedies in the following situations :
  - (i) High fuel consumption in IC engine
  - (ii) Overheating of IC engine
- (b) State the working of gas turbine with sketch.
- (c) Compare open and close cycle gas turbines with respect to components and working.
- (d) Enlist the application of submersible pumps.

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

**12**

- (a) Explain working principle of a screw compressor with sketches.
- (b) List any four methods to reduce power consumption in air compressor with justification.
- (c) In a diesel engine, heat is supplied at the rate of 19.50 kW. Engine Produces power at the rate of 4.2 kW. Estimate brake thermal efficiency.
- (d) A turbine is operating on 130 m of water head-The discharge is 3.5 m<sup>3</sup>/s. Find the power developed by the turbine neglecting the losses. Take density of water 9.81 kN/m<sup>3</sup>.
- (e) Enlist types of air compressors.

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

- (a) State the types of Air conditioning system and explain with sketch any one air conditioning system.
- (b) Suggest with justification, the type of air conditioner in the following situations :
  - (i) Computer Lab for 60 computere
  - (ii) A room of 5 metre  $\times$  5 metre
  - (iii) A city Bus of 45 people capacity
- (c) It was observed that when refrigerator is switched on the compressor does not start. Method the possible causes with remedies.

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

- (a) Describe the vapour compression cycle with neat sketch and state the function of any two component of it.
  - (b) State the requirement of boiler mountings and boiler accessories and name any three boiler mountings and three boiler accessories.
  - (c) Compare Reciprocating pump and Rotary pump and Draw the sketch of centrifugal pump.
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