

17406

11718

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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any SIX of the following: **12**

- (i) Define Thermodynamic system. State the types of systems.
- (ii) Define pure substance with its examples.
- (iii) State Boyle's law and Charles's law.
- (iv) State Avogadro's law with mathematical formulation.
- (v) Define boiler. Write any two types.
- (vi) Define two stroke engine.
- (vii) State the applications of compressed air.
- (viii) State applications of refrigeration process. (any four)

b) Attempt any TWO of the following: **8**

- (i) Define extensive and intensive properties with two examples of each type and their units.
- (ii) Discuss characteristics gas constant and universal gas constant.
- (iii) Draw a neat sketch of Cochran boiler with labels.

P.T.O.

- 2. Attempt any FOUR of the following:** **16**
- a) Explain concentrating collector with neat sketch.
 - b) State first law of thermodynamics and give its limitations.
 - c) A gas occupies a volume of 0.2m^3 at temperature of 40°C and pressure of 3 bar. Find final temperature of gas, if it is compressed to a pressure of 9 bar and occupies a volume of 0.08 m^3 .
 - d) Explain with schematic sketch working of four stroke diesel engine.
 - e) Explain working of single stage reciprocating air compressor.
 - f) Classify air conditioning system.
- 3. Attempt any FOUR of the following:** **16**
- a) Explain Geothermal power plant with neat sketch.
 - b) State Zeroth law of thermodynamics with its application.
 - c) Define adiabatic process. Show it on P-V and T-S diagram.
 - d) State advantages and drawbacks of two stroke engines.
 - e) Explain centrifugal compressor with neat sketch.
 - f) Enlist the components of vapour compression refrigeration system? State its functions.
- 4. Attempt any TWO of the following:** **16**
- a) Explain solar water heater with its construction and working.
 - b) Explain the construction and working of reaction type steam turbine.
 - c) Explain window air conditioner with neat sketch.

5. Attempt any TWO of the following: 16

- a) State second law of thermodynamics and explain its application as heat engine and heat pump.
- b) Show Isochoric, Isobaric, Isothermal and Polytropic process on P-V and T-S diagram.
- c) Differentiate between two stroke and four stroke engine any eight points.

6. Attempt any FOUR of the following: 16

- a) Differentiate between Heat and Work.
 - b) Explain Steam Power Plant with neat sketch.
 - c) Classify IC engines.
 - d) Explain screw compressor with neat sketch.
 - e) Classify Air compressors.
 - f) Explain working vapour compression system with neat schematic sketch.
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