

17406

21718

3 Hours / 100 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. a) Attempt any SIX of the following:** **12**
- (i) State any four non renewable energy sources.
 - (ii) Classify I.C. engine.
 - (iii) State any two methods to convert biomass into energy.
 - (iv) State Zeroth law of thermodynamics.
 - (v) State Bolye's law.
 - (vi) How air-compressors are classified?
 - (vii) State four uses of compressed air.
 - (viii) Define coefficient of performance.

P.T.O.

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

8

- (i) Explain working of four stroke diesel engine with neat sketch.
- (ii) Explain with suitable example 'Open system'.
- (iii) Plot following processes on P-V and T-S diagram.
 - 1) Isobaric
 - 2) Isentropic

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

16

- a) Compare S.I. engine and C.I. engine on the basis of:
 - (i) Basic cycle
 - (ii) Ignition system
 - (iii) Compression ratio
 - (iv) Speed
- b) Explain with neat sketch solar water heater.
- c) Define following term:
 - (i) Internal energy
 - (ii) Enthalpy
- d) State 'Avogadro's law. What do you mean by 'Universal gas constant'.
- e) Explain the working of single stage reciprocating compressor with P-V diagram.
- f) Explain 'Adiabatic process' with P-V and T-S diagram.

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

16

- a) State first law of thermodynamic explain with example.
- b) Explain with neat sketch working of screw compressor.
- c) Explain with neat sketch Tidal Power Plant.

- d) What are the advantages of two stage compression over single stage compression for the same pressure ratio.
- e) Gas in a container is at a pressure of 1.5 bar and volume of 4 m^3 . What is work done by gas if it expands of constant pressure to twice it's initial volume.
- f) Give the classification of boiler.
- 4. Attempt any TWO of the following: 16**
- a) Explain vapour compression cycle with P-H and T-S diagram? If vapour is saturated at the inlet to compression.
- b) Explain the construction and working of centrifugal compressor? Enlist its application.
- c) Explain construction and working of Impulse turbine with neat sketch.
- 5. Attempt any TWO of the following: 16**
- a) Explain the working of window air-conditioner with neat sketch.
- b) Explain with suitable example 'Intensive property and extensive property'.
- c) With neat sketch explain working of cochran boiler.
- 6. Attempt any FOUR of the following: 16**
- a) Explain with neat sketch Geothermal Power Plant.
- b) Differentiate between heat and work.
- c) Explain the term 'Irreversability' with example.
- d) State Charle's law and Boyle's law.
- e) Explain construction and working of two stroke petrol engine with neat sketch.
- f) Compare between 4-stroke and two stroke engine.
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