17406

11920

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Assume suitable data, if necessary.

(4) Use of Non-programmable Electronic Pocket Calculator is permissible.

(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 I.C. engine? Give suitable example.

(ii) State how the different energy sources are classified.

(iii) State Zeroth law of thermodynamics.

(iv) Define isothermal process. Represent it on P-V diagram.

(v) Describe in detail equation of state.

(vi) State the different uses of compressed air.

(vii) Distinguish between single stage and two stage reciprocating compressor.

(viii) Define VCC with its application.

Marks

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

(i) Differentiate between CI and SI engines.

(ii) Explain different phases of steam formation.

(iii) Represent adiabatic and polytropic process on P-V and T-S diagram.

2. Attempt any FOUR of the following: **16**

a) Explain working of two stroke petrol engine with neat sketch.

b) Explain flat plate collector and state its applications.

c) Define heat and work. Explain the term high grade energy.

d) State the assumptions made for principles of an ideal gas.

e) Explain two stage reciprocating compressor with neat sketch.

f) Differentiate between an adiabatic process and isothermal process.

3. Attempt any FOUR of the following: **16**

a) Explain the concept of enthalpy.

b) Differentiate between two stroke and four stroke engines.

c) Describe solar water heater with suitable sketch.

d) Explain with neat sketch screw compressor.

e) State Charle's law and Boyle's law.

f) Give the calssification of boilers.

4. Attempt any TWO of the following: **16**

a) State the classification of air conditioning system. Explain summer air conditioning system with neat sketch.

b) Explain Otto Cycle with P-V and T-S diagram. State the expression for air standard efficiency of Diesel cycle and Otto cycle. Compare the efficiencies of both cycles for same compression ratio.

c) Explain with neat sketch construction and working of centrifugal compressor with its application.

Marks

5. Attempt any TWO of the following: **16**

a) In a certain process 675 J heat is absorbed by system, while 290 J of work is done on system. What is change in internal energy of system?

b) Explain the construction and working of Cochran boiler with neat sketch.

c) Explain all year air conditioning system with neat sketch.

6. Attempt any FOUR of the following: **16**

a) (i) P.E.

(ii) K.E.

(iii) Internal Energy

(iv) Entropy

b) Differentiate between impulse turbine and reaction turbine.

c) Differentiate between extensive property and intensive property.

d) Define with suitable example

(i) Pure substance

(ii) Working substance

e) Explain the working of hydroelectric power plant with neat sketch.

f) Draw a well labelled diagram of window air conditioner.

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