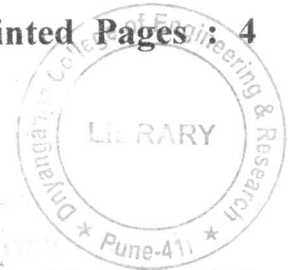


Total No. of Questions : 12]

[Total No. of Printed Pages : 4

[4061]-110

F. E. Examination - 2011
BASIC MECHANICAL ENGINEERING
(2008 Pattern)



Time : 3 Hours]

[Max. Marks : 100

Instructions :

- (1) Answer **any one** question from each unit.
- (2) Answers to the **two sections** should be written in **separate answer-books**.
- (3) Black figures to the right indicate full marks.
- (4) Neat diagrams must be drawn wherever necessary.
- (5) Use of electronic pocket calculator is allowed.
- (6) Assume suitable data, if necessary.

SECTION - I
UNIT - I

- Q.1) (A) What do you understand by Property of a System ? Distinguish between Extensive and Intensive Properties of a System ? [04]
- (B) Explain the following terms concerning Thermodynamic Systems : [06]
- (a) Polytropic Process
 - (b) Throttling Process
- (C) A certain gas occupies a space of 0.3m^3 at a pressure of 2 bar and a temperature of 77°C . It is heated at constant volume, until the pressure is 7 bar. Determine : [06]
- (a) temperature at the end of the process
 - (b) mass of the gas
 - (c) change in internal energy
 - (d) change in enthalpy
- Assume $c_p = 1.005 \text{ kJ/kgK}$; $c_v = 0.712 \text{ kJ/kgK}$; and $R = 287 \text{ J/kgK}$.

OR

[4061]-110

1

P.T.O.

- Q.2) (A) Explain the significance of First and Second Law of Thermodynamics by giving suitable examples. [06]
- (B) A cold storage is to be maintained at -5°C while the surroundings are at 35°C . The heat leakage from the surroundings into the cold storage is estimated to be 29 kW. The actual C.O.P. of the refrigeration plant is one-third of an ideal plant working between the same temperatures. Find the power required to drive the plant. [06]
- (C) Define the following : [04]
- (a) Heat Engine
- (b) Heat Pump

UNIT - II

- Q.3) (A) Explain with a neat diagram the working cycle of Open Cycle Gas Turbine. [06]
- (B) Describe with a block diagram and state the applications of the following : [10]
- (a) Single Acting Reciprocating Pump
- (b) Reciprocating Air Compressor

OR

- Q.4) (A) Explain the working principle of Split Air Conditioner with a neat labelled diagram. [06]
- (B) How does the Internal Combustion Engines are classified ? List out the advantages and disadvantages of a Two Stroke Cycle Engine over a Four Stroke Cycle Engine. [10]

UNIT - III

- Q.5) (A) Derive an expression for heat conduction through an infinitely long hollow cylinder. [06]

