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Total No. of Questions—12]

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[4062]-111

S.E. (Mech. Engg.) (First Semester) EXAMINATION, 2011

APPLIED THERMODYNAMICS

(2008 PATTERN)

Time : Three Hours

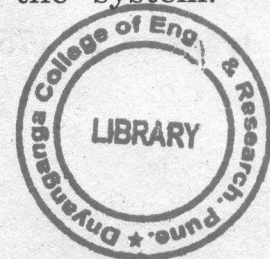
Maximum Marks : 100

- N.B. :— (i) Answer Q. Nos. 1 or 2, 3 or 4, 5 or 6 from Section I and Q. Nos. 7 or 8, 9 or 10, 11 or 12 from Section II.
- (ii) Answers to the two sections should be written in separate answer-books.
- (iii) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
- (iv) Assume suitable data, if necessary.

SECTION I

1. (a) State Clausius and Kelvin-Planck statements of second law and prove their equivalence. [8]
- (b) A reversible heat pump is used to maintain a temperature of  $0^{\circ}\text{C}$  in a refrigerator when it rejects the heat to the surroundings at  $27^{\circ}\text{C}$ . Determine COP of the machine and work input required if the heat removal rate is 25 kW.

If the required input to run the pump is developed by reversible engine which receives heat at 673 K and rejects heat to the atmosphere. Determine overall COP of the system. [8]



P.T.O.

