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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Aerospace Engg.) (2012 Onwards)/B.Tech.(ANE) (Sem.-4)

THERMODYNAMICS

Subject Code : ANE-205

Paper ID : [A1030]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Answer briefly :**

- (a) Define law of conservation of energy.
- (b) Define a system.
- (c) Define a process.
- (d) Define isothermal process.
- (e) Define macroscopic forms of energy.
- (f) Differentiate between two stroke and four stroke petrol engines.
- (g) Explain Rankine Cycle processes.
- (h) Define Dalton's law of additive pressures.
- (i) Define dew-point temperature.
- (j) Where psychrometric charts are used?

SECTION-B

2. Determine the atmospheric pressure at a location where the barometric reading is 740 mm Hg and the gravitational acceleration is $g = 9.81 \text{ m/s}^2$. Assume the temperature of mercury to be 10°C , at which its density is $13,570 \text{ Kg/m}^3$.
3. A site evaluated for a wind farm is observed to have steady winds at a speed of 8.5 m/s. Determine the wind energy (a) per unit mass (b) for a mass of 10 kg.
4. Find the expression of thermal efficiency of a heat engine.
5. Discuss the increase of entropy principle.
6. Discuss Carnot cycle and its value in engineering.

SECTION-C

7. Derive relation for internal energy changes.
8. A rigid tank contains 2 k mol of N_2 and 6 k mol of CO_2 gases at 300 K and 15 M Pa. Estimate the volume of the tank on the basis of:
 - (a) The ideal-gas equation of state.
 - (b) Kay's rule.
9. Discuss Brayton cycle and find the efficiency (Thermal) expression for this cycle.