Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ME) (Sem.–3)

BASIC THERMODYNAMICS

Subject Code : BTME305-18

M.Code : 76422

Date of Examination : 19-05-2023

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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. Write briefly :

a. Define thermodynamics.

b. Define the concept of continuum.

c. Define the specific heats at constant volume and constant pressure.

d. How does Celsius temperature scale differ from absolute Kelvin scale?

e. What is an ideal gas? How does it differ from a perfect gas?

f. What are the two requirements for a process to be isentropic?

g. List the assumptions made in the analysis of air standard cycles.

h. What is meant by intercooling?

i. What do you understand by reheating?

j. What is meant by low grade and high grade energy?

SECTION-B

2. What is the relationship between a system and its environment when the system is (a) adiabatic, (b) isolated?

3. Define and explain with the help of neat sketch the Zeroth Law of Thermodynamics. Why it is so called?

4. A reversible heat engine delivers 0.6 kW power and rejects heat energy to a reservoir at 300 K at the rate of 24 kJ/min. Make calculations for the engine efficiency and the temperature of the thermal reservoir supplying heat to the engine.

5. Show that COP of a heat pump is greater than COP of a refrigerator by unity.

6. Entropy is defined in terms of a reversible process. How can then it be evaluated for an irreversible process?

SECTION-C

7. An air standard Diesel cycle has compression ratio of 14. The pressure at the beginning of the compression stroke is 1 bar and temperature 27°C. The maximum temperature of the cycle is 2500°C. Determine the thermal efficiency of the engine.

8. What is meant by constant dryness fraction lines? How these are plotted on T-S diagram.

9. How we compare the gas turbines with steam turbines and internal combustion engines. Explain with neat and clean sketch.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.