Code No.: ME305PC | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Supply) – August - 2023
THERMODYNAMICS
(MECH)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a) Define the Isolated System. [2M]
   b) Show that heat is a path function. [2M]
   c) Write the COP relation between heat pump and refrigerator. [2M]
   d) Summarize the characteristics of pure substances. [2M]
   e) Write the dryness value for dry steam. [2M]
   f) List the advantages of Mollier chart. [2M]
   g) What are the assumptions of ideal gas? [2M]
   h) Explain the importance of compressibility chart. [2M]
   i) Write the formula for thermal efficiency of Otto cycle. [2M]
   j) Draw the P-V diagram of Brayton cycle. [2M]

PART-B **(50 Marks)**

2. Examine the Quasi-Static process with neat sketch. [10M]

OR

3. Define the property of a System? Distinguish between Extensive and Intensive properties of a system. [10M]

4. Explain the Kelvin planck statement of Second law of Thermodynamics with neat sketch. [10M]

OR

5. A heat engine does 50 kJ of workdone per cycle. The efficiency of the heat engine is 75%. Determine the amount of heat rejected per cycle. [10M]

6. Explain the Free expansion and Throttling processes. Discuss its practical applications. [10M]

OR

7. What do you understand by Dryness fraction of steam? [10M]

8. Deduce the expression of Vander Waals equation of state for the real gases and also state the assumptions in its derivation. [10M]

OR

9. Explain the following:
   a) Dry Bulb Temperature. [2.5M]
   b) Wet Bulb Temperature. [2.5M]
   c) Specific Humidity. [2.5M]
   d) Relative Humidity. [2.5M]

10. Derive on expression for the thermal efficiency of an Diesel cycle. [10M]

OR

11. Draw P-h and T-S chart for vapour compression refrigeration system and explain the principle of operation. [10M]

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