MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech I Sem Supply End Examination, July-2022
Thermodynamics
(MECHANICAL ENGINEERING)

Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
  Each question carries 10 marks and may have a, b as sub questions.

PART- A
(10*2 Marks = 20 Marks)

1. a)	Define system and surroundings, Give suitable examples.	2M	CO1	BL1
b)	What are various types of boundaries?	2M	CO1	BL1
c)	How do you apply steady flow energy equation to a throttling device?	2M	CO2	BL1
d)	Explain law of conservation of mass.	2M	CO2	BL1
e)	What is a heat engine? Explain with the help o f a diagram.	2M	CO3	BL1
f)	What is PMM-II?	2M	CO3	BL1
g)	Define mole fraction and mass fraction.	2M	CO4	BL1
h)	What is a pure substance? Explain with suitable examples.	2M	CO4	BL1
i)	Draw the p-v and T-s plots of Diesel cycle.	2M	CO5	BL1
j)	Draw the layout of Rankine cycle.	2M	CO5	BL1

PART- B
(10*5 Marks = 50 Marks)

2 a)	Differentiate between point and path functions.	5M	CO1	BL2
b)	What do you mean by thermodynamic equilibrium? Explain in detail.	5M	CO1	BL4

OR

3	Describe the construction and working principle of constant volume gas thermometer.	10M	CO1	BL2

4 a)	Prove that internal energy is a property.	5M	CO2	BL3
b)	Write the statement of First law of Thermodynamics.	5M	CO2	BL1

OR

5	Derive steady flow energy equation and discuss its applications.	10M	CO2	BL6

6	a)	Show that two reversible adiabatic's cannot intersect each other.	5M	CO3	BL3
	b)	Discuss about Pinciple of entropy increase.	5M	CO3	BL2

OR

7	Derive Maxwell's relations.	10M	CO3	BL6

8	a)	How do you determine internal energy and enthalpy and entropy of mixture of gases?	5M	CO4	BL1
	b)	Define the terms volume fraction, equivalent gas constant, equivalent molecular weight.	5M	CO4	BL1

OR

9	How do you determine dryness fraction of steam with separating and throttling calorimeter.	10M	CO4	BL1

10	a)	Draw the Layout, p-v and T-s diagrams of Brayton cycle and derive expression for efficiency.	5M	CO5	BL6
	b)	Compare Otto, Diesel and dual cycle for same maximum pressure and temperature heat rejection and give your conclusions.	5M	CO5	BL2

OR

11	Derive the expression for work done, thermal efficiency, mean effective pressure of Otto cycle.	10M	CO5	BL6

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