

UNIT-2

S.No	Questions	BT	CO	PO
Part–A(Short Answer Questions)				
1	What is PMM-I? Justify with reason whether it is feasible or not.	2	3	2
2	Define PMM-II.	2	2	2
3	What are the applications of SFEE?	1	3	2
4	What is the First Law of Thermodynamics? State its limitations.	1	3	2
5	What is a thermal reservoir?	1	3	2
6	Define a Heat Engine. Explain its significance.	1	3	2
7	Define enthalpy. Explain its significance.	1	2	2
8	Define entropy. Explain its significance.	1	2	2
9	Differentiate between intensive and extensive properties.	2	2	2
10	What do you mean by the term 'Property'? Prove that heat and work are not point functions.	1	2	2
Part– B(Long Answer Questions)				
11	a) Explain First law of thermodynamics.	1	3	1,2
	b) Explain and derive Steady Flow Energy Equation.	2	3	2
12	a) Explain Second Law of Thermodynamics. Prove that violation of Kelvin Plank statement leads to violation of Clausius statement.	2	3	2
	b) A cyclic heat engine operates between a source temperature of 800 C and a sink temperature of 300 C. What is the least rate of heat rejection per kW net output of the engine?	2	3	2
13	a) Prove that the violation of Clausius statement leads to violation of Kelvin Plank statement.	3	3	2
	b) An air compressor handles 6.0 m ³ /min of air with a density of 1.26 kg/m ³ and a pressure of 1.013 bar, and it discharges 450 kPa with a density of 4.86 kg/m ³ . The change in specific internal energy across the compressor is 82 kJ/kg and heat loss by cooling is 24 kJ/kg. Neglecting KE and PE, find the work in kW	4	3	2
14	a) Derive an expression for MAXWELL relations?	2	3	2
	b) What is the difference between steady flow and non–flow process?	2		2
15	a) Discuss about Clausius Inequality	2	3	2
	b) Derive the expression for efficiency of the carnot cycle.	2	3	2
16	a) A cylinder contains 0.45 m ³ of gas at 1 x 10 ⁵ N/m ² and 80 C. The gas is compressed to a volume of 0.13 m ³ , the final pressure being 5 X 10 ⁵ N/m ² . Determine i) The mass of gas ii) The value of index „n“ for compression The increase in internal energy of the gas and iv) The heat received or rejected by the gas during compression. Take $\gamma = 1.4$ $R = 294.2 \text{ J/kgK}$	5	3	2
	b) Explain joule experiment for first law of TD?			