

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER – I • EXAMINATION – WINTER 2012

Subject code: X 11902**Date: 21/01/2013****Subject Name: Engineering Thermodynamics****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain open, closed and isolated system along with examples. **07**
(b) Explain limitations of first law of thermodynamics. **07**
- Q.2** (a) An air standard Otto cycle is required to operate between the temperature limits of 300K and 1800K. Estimate the optimum compression ratio and the corresponding thermal efficiency. **07**
(b) Write short note on third law of thermodynamics. **07**
- OR**
- (b) Derive steady flow energy equation applied to nozzle. **07**
- Q.3** (a) Explain variables affecting efficiency of Rankine cycle. **07**
(b) Write short note on thermodynamic temperature scale. **07**
- OR**
- Q.3** (a) Explain adiabatic flame temperature. **07**
(b) Compare Otto cycle and diesel cycle for the same compression ratio. **07**
- Q.4** (a) Explain in brief the concept of available energy and unavailable energy. **07**
(b) Write short note on joule-Thomson co-efficient. **07**
- OR**
- Q.4** (a) Using Maxwell relations derive the Clausius clapeyron equation. **07**
(b) Derive relation for air standard efficiency of Otto cycle. **07**
- Q.5** (a) Enlist methods to determine the calorific value of solid and liquid fuels and explain any one of them with neat sketch. **07**
(b) Derive Vander wall's equation. **07**
- OR**
- Q.5** (a) Explain Adiabatic compressibility. **07**
(b) Explain the principle of increase of entropy. **07**
