

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- 1st / 2nd • EXAMINATION – SUMMER • 2014

Subject Code: 110006

Date: 18-06-2014

Subject Name: Elements of Mechanical Engineering

Time: 02:30 pm - 05:00 pm

Total Marks: 70

Instructions:

1. Attempt any five questions
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of steam tables is permissible.

- Q.1** (a) Discuss the quality and quantity governing method of IC engine. **07**
(b) With a neat sketch explain combined separating and throttling calorimeter. **07**
- Q.2** (a) State the advantages and disadvantages of gaseous fuels. List the various gaseous fuels. **07**
(b) Define the following **07**
(i) Energy (ii) Specific heat
(iii) Zeroth law of thermodynamics (iv) Temperature
- Q.3** (a) With a neat sketch explain the working of vapour compression refrigerant system. **07**
(b) A system contains 0.19 m^3 of air at pressure of 5 bar and 190°C . It is expanded adiabatically until the pressure is 1 bar. The gas is then heated at constant pressure till its enthalpy increases by 100 kJ. Determine total work done. **07**
- Q.4** (a) Derive an expression for air standard efficiency of Otto cycle. **07**
(b) Two boiler A and B discharge equal amount of steam into common main steam pipe. **07**
The boiler A discharges steam at 10 bar and 350°C and B discharges at 10 bar and with dryness fraction 0.9. Calculate the condition of steam after mixing.
- Q.5** (a) With a neat sketch explain the working of any one type of water tube boiler. **07**
(b) Explain the working of 4 stroke diesel engine. **07**
- Q.6** (a) Differentiate between belt, chain and gear drive. **07**
(b) Explain the concept of multistaging in reciprocating compressor. What are its advantages ? **07**
- Q.7** (a) With a neat sketch explain any one type of coupling. **07**
(b) Enlist the properties and applications of any one non-ferrous metal. **07**
