

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC- SEMESTER-I - EXAMINATION – SUMMER 2017

Subject Code: X11102

Date:03/06/2017

Subject Name: ELEMENTS OF MECHANICAL AND STRUCTURAL

Time: 02:30 PM to 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.

- Q.1** (a) What is the meaning of the term “one ton capacity” of Air Conditioner? **07**
Compare Window A.C. with Split A.C.
- (b) Explain with neat diagrams the working of Vapour Compression Refrigeration system. **07**
- Q.2** (a) Draw air standard Diesel cycle on p-V and T-s diagram. Derive the expression for air standard efficiency of Diesel cycle with usual notations. **07**
- (b) Explain with sketch the construction and working of four stroke petrol engine. **07**
- Q.3** (a) List out the types of beams and show the different type of loads acting on beams with neat diagrams. **07**
- (b) Write a short note on : Thermodynamic Systems **07**
- Q.4** (a) Derive relation between Modulus of Elasticity (E), Modulus of Rigidity (G) and Poisson’s Ratio ($1/m$) **07**
- (b) Compare Two stroke I.C engines with four stroke I.C.engines. **07**
- Q.5** (a) Classify the compressors. Draw neat sketch of any one. **07**
- (b) In an air standard Otto cycle, the compression ratio is 7 and the compression begins at 35°C and 0.1 MPa. The maximum temperature of the cycle is 1100°C. Find (a)the temperature and the pressure at various points in the cycle(b)the cycle efficiency. **07**
- Q.6** (a) Define the terms: (i) Hardness (ii) Toughness (iii) Elasticity (iv) Plasticity (v) Ductility (vi) Rigidity (vii) Resilience **07**
- (b) Define the terms: (i) System (ii) Phase (iii) Specific heat (iv) Work (v) Enthalpy (vi) Pressure (vii) Thermal Efficiency **07**
- Q.7** (a) Write a short note on: Thermodynamic Equilibrium **07**
- (b) Write a short note on: Centrifugal pump **07**
