

GUJARAT TECHNOLOGICAL UNIVERSITY**PDDC - Ist Semester–Examination – May/June- 2012****Subject code: X11102****Subject Name: Elements of Mechanical And Structural Engineering****Date: 02/06/2012****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 various sources of energy. **07**
 (b) Explain working of four stroke petrol engine with neat sketch. **07**
- Q.2** (a) Explain desirable properties of refrigerants. **07**
 (b) Explain vapour compression refrigeration with neat sketch. **07**
- OR**
- (b) Explain carnot cycle on p-v diagram. **07**
- Q.3** (a) Explain construction and working of centrifugal pump with neat sketch. **07**
 (b) Explain uses of compressed air. **07**
- OR**
- Q.3** (a) Explain difference between Otto cycle and Diesel cycle. **07**
 (b) Explain difference between governor and flywheel. **07**
- Q.4** (a) Explain bulk modulus and Poisson ratio. **07**
 (b) Derive formula for the elongation of tapered circular bar under the action of axial load. **07**
- OR**
- Q.4** (a) Write short note on factor of safety. **07**
 (b) What is the difference between ductile and brittle materials? Explain their behavior under tensile loading. **07**
- Q.5** (a) Define: Stress, Strain and Hardness. **07**
 (b) State types of beam and draw it. State the different type of loads on beam. **07**
- OR**
- Q.5** (a) Derive an expression of stiffness of a shaft under torsion. **07**
 (b) Find reactions about support A and B for the simply supported beam as shown in figure below. **07**


