## **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.	<b>07</b>
	<b>(b)</b>	Explain working of four stroke petrol engine with neat sketch.	07
Q.2	(a)	Explain desirable properties of refrigerants.	07
	<b>(b)</b>	Explain vapour compression refrigeration with neat sketch.	<b>07</b>
		OR	
	<b>(b)</b>	Explain carnot cycle on p-v diagram.	07
Q.3	(a)	Explain construction and working of centrifugal pump with neat sketch.	07
	<b>(b)</b>	Explain uses of compressed air.	<b>07</b>
		OR	
Q.3	(a)	Explain difference between Otto cycle and Diesel cycle.	<b>07</b>
	<b>(b)</b>	Explain difference between governor and flywheel.	07
Q.4	(a)	Explain bulk modulus and Poisson ratio.	07
	<b>(b)</b>	Derive formula for the elongation of tapered circular bar under the action of axial load.	07
		OR	
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<b>Q.4</b>		Write short note on factor of safety.	07
	<b>(b)</b>	*	<b>07</b>
		behavior under tensile loading.	
Q.5	(a)	Define: Stress, Strain and Hardness.	07
	<b>(b)</b>	State types of beam and draw it. State the different type of loads on beam.	<b>07</b>
		OR	
Q.5	(a)	Derive an expression of stiffness of a shaft under torsion.	<b>07</b>
-	<b>(b)</b>	Find reactions about support A and B for the simply supported beam as shown	07
		in figure below.	

