Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE/PDDC- SEMESTER– 1st / 2nd • EXAMINATION – WINTER 2017

Subject Code: 110006   **Date: 02/01/2018**

Subject Name: Elements of Mechanical Engineering

Time:10:30 AM TO 01:00 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)**	Write short note on babcock and Wilcox boiler.	**07**
	(b)	Give function of following: (i) water level indicator (ii) fusible plug (iii) bearings (iv) coupling (v) economiser	**07**
Q.2	**(a)**	Define the term 'Refrigeration'. Explain Vapour compression refrigerator.	**07**
	(b)	Define perfect gas and with usual notation prove $C_p - C_v = R$ for perfect gas.	**07**
Q.3	**(a)**	What do you mean by Dryness fraction? Describe Combined calorimeter with a neat sketch.	**07**
	(b)	Define the following terms: (a)Wet steam (b) Degree of superheat (c) Saturation temperature (d) Prime mover (e) Enthalpy of evaporation	**07**
Q.4	**(a)**	Explain construction and working of reciprocating pump with a neat sketch.	**07**
	(b)	Classify the Air compressor. Differentiate between reciprocating compressor & rotary compressor.	**07**
Q.5	**(a)**	Explain working of four stroke petrol engine with neat sketch.	**07**
	(b)	Discuss various types of power transmission devices.	**07**
Q.6	**(a)**	A four cylinder two stroke petrol engine with stroke to bore ratio 1.2 developes 35 KW brake power at 2200 rpm. The mean effective pressure in each cylinder is 9 bar and mechanical efficiency is 78%. Determine (1) Diameter and stroke of each cylinder (2) Brake thermal efficiency (3) Indicated thermal efficiency. If fuel consumption 8 kg /hr having C.V.=43000KJ/Kg.	**07**
	(b)	Derive the equation for air standard efficiency of otto cycle.	**07**
Q.7	**(a)**	Write advantages of gaseous fuels over other fuels. Write short note on CNG.	**07**
	(b)	Define following mechanical properties: (1)Elasticity (2)Malleability (3)Ductility (4)Impact strength (5)Hardness (6)Toughness (7) Resiliance	**07**

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