Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-I • EXAMINATION – WINTER 2014

		ıbject Code: 110006	Date: 26-12-14	
		ibject Name: ELEMENTS OF MECHANIC ime:10.30a.m01.00p.m.	CAL ENGINEERING Total Marks: 70	
		structions:	Total Walks. 70	
		1. Attempt any five questions.		
		2. Make suitable assumptions wherever nece	essary.	
		3. Figures to the right indicate full marks.		
Q. 1 (a)		Five kg of air is heated from initial volume of 0.5 m^3 to final volume of 1.3 m^3 at constant operature 4 bar. Determine (1) heat supplied (2) work done (3) initial and final temperature of air. Take $C_p=1.005 \text{ KJ/kg-K}$ and $R=0.287 \text{ KJ/kg-K}$		07
	(b)	Explain with a neat sketch Lancashire boiler.		07
Q. 2 (a)		What is the function of pump? Classify the pumps. Explain with sketch the working of single acting piston pump.		07
	(b)	engine power =20 KW, Brake thermal efficient	0.1 m and stroke 0.13 m. Piston speed =10.5 m/s, ency =35%, Calorific value =42 MJ/kg, specific om(2)brake power and fuel consumption in litres	07
Q. 3	(a)	Prove the equation for air standard efficiency of	f otto cycle.	07
	(b)	Discuss Watt Governor and Porter Governor in		07
Q. 4 (a)		Discuss various types of power transmission de	vices	07
	(b)	Define following mechanical properties 0		07
		(1) Elasticity (2) Malleability (3) Ductility (4) Impacts trength (5) Hardness (6) Toughness (7) Resiliance (1) Elasticity (2) Malleability (3) Ductility (4) Impacts trength (5) Hardness (6) Toughness (7) Resiliance (1) Elasticity (1) Elasticity (2) Malleability (3) Ductility (4) Impacts trength (5) Hardness (6) Toughness (7) Resiliance (1) Elasticity (1) Elasticity (2) Malleability (3) Ductility (4) Impacts trength (5) Hardness (6) Toughness (7) Resiliance (1) Elasticity (1) Elasticity (2) Malleability (3) Ductility (4) Impacts trength (5) Hardness (6) Toughness (7) Resiliance (1) Elasticity (1)		
Q. 5	(a)	Following data were recorded during the test of steam by combined throttling and separating calorimeter:		07
		Water separated in separating calorimeter	0.4 kg	
		Steam discharge from throttling calorimeter	6 kg	
		Steam pressure in the main pipe	10 bar	
		Manometer reading	170 mm of Hg	
		Barometer reading	760 mm of Hg	
		Temperature of steam after throttling	130^{0} C	
		Determine dryness fraction of steam. Take C _{ps} =	2.1 KJ/kg-K	
Q. 5	(b)	Derive characteristics equation of a perfect gas.		07 07
Q. 6	(a)	Explain the following terms in brief:		07
		(1)Heat and work		
		(2)Specific heat and calorific value of fuel		
		(3) Differentiate between vapor and gas		
0 ((1.3	(4) List various source of energy	and of them	Λ=
Q. 6	(b)	List various types of bearings and discuss any three of them.		07
Q. 7	(a)			07
Q. 7	(b)	with the help of heat sketch the working of fou	i shoke diesel eligille.	07
		ماه	ታ ተ ተ ተ ተ	