Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – SUMMER • 2014

Subject Code: 130405 **Date: 23-05-2014**

Subject Name: Thermodynamics

Time: 02.30 pm - 05.00 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)**	Define: 1) Thermodynamic equilibrium, 2) critical point and triple point of pure substance.	**06**
	(b)	Describe the microscopic and macroscopic approach of thermodynamics.	**08**
Q.2	**(a)**	Describe Zeroth law and write its application.	**07**
	(b)	What is meant by steady flow energy equation (SFEE) and its application?	**07**
		OR	
	(b)	How heat pump and refrigerator works with second law of thermodynamics?	**07**
Q.3	**(a)**	Explain the Carnot cycle and describe its significance.	**07**
	(b)	How calorific value of fuel is determined give details of Bomb Calorimeter with neat diagram.	**07**
		OR	
Q.3	**(a)**	Define Avagadro's Law, derive it for gas mixtures. What is meant by Ideal gas equation?	**07**
	(b)	What is meant by point function and path function? Explain and derive that work is a path function.	**07**
Q.4	**(a)**	Write down the Vander Waal's equation for gas mixture, its significance and limitations.	**07**
	(b)	Define entropy, its characteristics properties and significance.	**07**
		OR	
Q.4	**(a)**	What is Gibb's Dalton Law of gas mixtures? What is meant by partial pressure, what is its role in it?	**07**
	(b)	Derive Raoults' law and write its significance.	**07**
Q.5	**(a)**	Derive available and unavailable energy with reference to a thermodynamic cycle	**07**
	(b)	Write about thermodynamics temperature scale.	**07**
		OR	
Q.5	**(a)**	Explain the importance of first law of thermodynamics with suitable examples.	**07**
	(b)	Define a heat exchanger, how it is working as condenser, evaporator and radiator?	**07**

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