

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2132502****Date: 11/06/2019****Subject Name: Engineering Thermodynamics & Heat transfer****Time: 02:30 PM TO 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.

		MARKS
Q.1	(a) How Engineering Thermodynamics & Heat Transfer will be helpful to you?	03
	(b) Explain the following terms:	04
	(1) System	
	(2) Property	
	(3) Boundary	
	(4) Pure substance	
	(c) State First Law of Thermodynamics. Explain the application of it to open and close systems.	07
Q.2	(a) Explain the following terms:	03
	(1) Entropy	
	(2) Triple point	
	(3) Critical Point	
	(b) Define energy and exergy with suitable example.	04
	(c) Write Kelvin's and Clausius statements of second law. Describe the concept of reversibility and irreversibility	07
	OR	
	(c) Write a short note on Carnot Cycle.	07
Q.3	(a) Classify various types of irreversibility.	03
	(b) Derive general steady flow energy equation.	04
	(c) Explain the process of steam formation using p-v and h-s diagram.	07
	OR	
Q.3	(a) Compare the terms: conduction and convection.	03
	(b) Explain the following laws:	04
	(1) Fourier's Law of heat conduction	
	(2) Newton's Law of cooling	
	(c) Define Property. State difference between Microscopic approach and Macroscopic approach.	07
Q.4	(a) Differentiate between laminar and turbulent flows.	03
	(b) Differentiate between steady state and transient heat conduction.	04
	(c) State the types of heat convection and differentiate between them.	07
	OR	
Q.4	(a) Write the general three dimensional general heat conduction equation in:	03
	(1) Cartesian co-ordinates	
	(2) Cylindrical co-ordinates	
	(3) Spherical co-ordinates	
	(b) Discuss the factors which affect the convective heat transfer coefficient.	04
	(c) Derive the dimensional less numbers as applied to the analysis of forced convection by dimensional analysis.	07

- Q.5 (a) Define Reflectivity, Absorptivity and Transmissivity of a surface. **03**
(b) State and express in equation: Stefan Boltzmann law of radiation and Kirchhoff's law of radiation. **04**
(c) Classify various heat exchangers. Explain any one in brief. **07**
- OR**
- Q.5 (a) What do you mean by fouling factor? What are causes of fouling? **03**
(b) How the cross-flow and multipass heat exchangers are analyzed using LMTD method? **04**
(c) Define Radiation. Classify and explain various types of bodies. **07**

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