

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III (New) EXAMINATION – WINTER 2019****Subject Code: 2132502****Date: 3/12/2019****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) Define the term thermodynamics and explain its importance.	03
	(b) Define following terms. 1) Pure substance 2) Critical point 3) Triple point 4) heat	04
	(c) Explain different types of thermodynamic systems with suitable example.	07
Q.2	(a) Give the limitations of the first law of thermodynamics and also give statement of second law of thermodynamics.	03
	(b) Discuss following terms. 1) p-v-T surface 2) Phases of pure substance	04
	(c) Derive the equation $(COP)_{\text{Heat Pump}} = (COP)_{\text{Refrigerator}} + 1$	07
OR		
	(c) Discuss kelvin-planck and clausius statement of second law of thermodynamics	07
Q.3	(a) Explain newton's law of cooling.	03
	(b) Explain mechanism of heat transfer by conduction.	04
	(c) Derive equation for exergy of steady flow open system	07
OR		
Q.3	(a) Write a short-note on convection heat transfer.	03
	(b) Explain fourier's law of heat conduction.	04
	(c) Derive equation for exergy of closed system by considering non flow process.	07
Q.4	(a) Define following terms. 1) Reflectivity 2) Absorptivity. 3) Transmissivity.	03
	(b) List out different laws of radiation and explain any one.	04
	(c) Derive equation for heat transfer through composite wall having resistance in series.	07
OR		
Q.4	(a) Differentiate conduction, convection and radiation.	03
	(b) Explain different types of surfaces/bodies in radiation.	04
	(c) Derive equation for heat transfer through composite cylinder with conduction and convection.	07
Q.5	(a) Define condensation and explain different types of condensation.	03
	(b) Classify heat exchanger according to heat transfer process.	04
	(c) Discuss convection heat transfer coefficient.	07
OR		
Q.5	(a) Define boiling and explain different methods of boiling.	03
	(b) Classify heat exchanger according to arrangements of fluids.	04
	(c) Explain concept of boundary layer in convection heat transfer.	07
