

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER- VI EXAMINATION – SUMMER 2026****Subject Code:3161910****Date:08-06-2026****Subject Name:Applied Thermodynamics****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) State and explain Avogadro's law.	03
	(b) Explain law of corresponding states.	04
	(c) State and explain desirable properties of refrigerants.	07
Q.2	(a) Explain Dalton's law of partial pressure.	03
	(b) Explain briefly secondary refrigerants.	04
	(c) Explain sensible cooling process.	07
	OR	
	(c) Derive Vander Waal's equation.	07
Q.3	(a) Classify types of refrigerants used in refrigeration system.	03
	(b) Write desirable characteristics of refrigerant - absorbent pair for vapor absorption cycle.	04
	(c) Explain simple H ₂ O -NH ₃ cycle with neat sketch.	07
	OR	
Q.3	(a) State assumptions for fuel-air cycles.	03
	(b) Explain reasons for variation of specific heats of gases.	04
	(c) Discuss effect of variable specific heats on Otto, Diesel and Dual cycle.	07
Q.4	(a) Define indicated power, brake power, friction power.	03
	(b) Explain different sources of engine emissions.	04
	(c) Explain working of variable compression ratio engines.	07
	OR	
Q.4	(a) Explain function of intercooler.	03
	(b) Explain the effect of Mach number on compressibility.	04
	(c) Explain construction and working of reciprocating air compressor.	07
Q.5	(a) Define Degree of reaction.	03
	(b) Explain Losses in centrifugal compressor.	04
	(c) Write short note on performance characteristics of axial flow compressors.	07
	OR	
Q.5	(a) Explain Lift and drag.	03
	(b) Explain Mach number and its significance.	04
	(c) A cold storage is to be maintained at -5°C (268K) while the surroundings are at 35°C. The heat leakage from the surroundings into the cold storage is estimated to be 29 kW. The actual C.O.P of the refrigeration plant is one third of an ideal plant working between the same temperatures. Find the power required to drive the plant.	07
