

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2023****Subject Code:3132504****Date:18-01-2024****Subject Name:Basic and 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) What is the rationale of learning the subject Basic & Applied Thermodynamics Subject?	03
	(b) Explain a concept of system, boundary and surrounding in engineering thermodynamics.	04
	(c) Define following with respect to thermodynamics (i) state (ii) process (iii) cycle	07
Q.2	(a) Give the statement of First law of thermodynamics.	03
	(b) Give full form of PMM. Why PMM1 is impossible?	04
	(c) Give clausius statement and Kelvin-plank statement for the 2 nd law of thermodynamics. Also explain PMM2.	07
	OR	
	(c) Define Entropy. Also explain change of entropy in a reversible process.	07
Q.3	(a) Give three comparisons of rankine cycle and carnot cycle.	03
	(b) Draw rankine cycle and explain which processes it comprises.	04
	(c) With P-V and T-S diagram explain carnot vapour cycle. Also give limitations of carnot cycle.	07
	OR	
Q.3	(a) What are the advantages of reheating of steam?	03
	(b) Draw only schematic, P-V and T-S diagram of ideal brayton cycle.	04
	(c) With P-V & T-S diagram explain otto cycle. Also derive air standard efficiency of otto cycle.	07
Q.4	(a) Give full form of COP. Define COP with respect to refrigeration cycle.	03
	(b) Briefly explain Bell-Coleman Cycle.	04
	(c) Explain simple vapour compression refrigeration cycle on P-h and T-s diagram.	07
	OR	
Q.4	(a) Classify steam turbine.	03
	(b) What is compounding of steam turbine?	04
	(c) What is governing of steam turbine? Explain throttle, nozzle and bypass governing.	07
Q.5	(a) State zeroth law of thermodynamics.	03
	(b) What is clausius inequality?	04
	(c) Compare Otto, Diesel and Dual Cycle.	07

OR

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| Q.5 | (a) | What is mean effective pressure? | 03 |
| | (b) | Define (i) Air Standard Efficiency & (ii) Brake thermal efficiency | 04 |
| | (c) | Deduce the expression for steady flow energy equation to steam turbine system. | 07 |
