Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER 2013

Subject Code: 142501 **Date: 07-06-2013**

Subject Name: Heat Power Engineering

Time: 10:30am – 01:00pm **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)**	Explain: (i) Thermal Equilibrium (ii) Entropy	**07**
	(b)	Give different statements of 2nd law of thermodynamics. Also state 3rd law of thermodynamics.	**07**
Q.2	**(a)**	Derive the general expression for the change of entropy of perfect gas having mass of m kg.	**07**
	(b)	State limitations of 1st law of thermodynamics and explain Clausius inequality.	**07**
		OR	
	(b)	Derive the equation for thermal efficiency of Carnot cycle.	**07**
Q.3	**(a)**	A Carnot engine works between temperature limits of 870 K and 290 K. The engine receives 4200 kJ of heat per minute. Determine the power of the engine and the amount of heat rejected to the sink.	**07**
	(b)	Explain Otto cycle with p-v diagram.	**07**
		OR	
Q.3	**(a)**	What is steam nozzle? Explain the effect of friction on the steam flow through nozzle.	**07**
	(b)	What is steam turbine? Differentiate between impulse and reaction turbine.	**07**
Q.4	**(a)**	Explain the working of constant pressure closed cycle turbine with simple diagram.	**07**
	(b)	Explain construction and working of a single stage, single acting reciprocating air compressor.	**07**
		OR	
Q.4	**(a)**	Explain air compressor terminology.	**07**
	(b)	Explain reversed Carnot cycle for air refrigeration.	**07**
Q.5	**(a)**	Explain Bell Coleman air refrigeration cycle.	**07**
	(b)	What are the advantages and disadvantages of air refrigeration system?	**07**
		OR	
Q.5	**(a)**	Explain vapour compression refrigeration cycle with flow diagram.	**07**
	(b)	What is black body? Explain different modes of heat transfer.	**07**

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