GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-IV EXAMINATION – SUMMER 2016

	Subj	ect Code:142501	Date:30/05/2016	
	Subje Time Instru	 ect Name:Heat Power Engineering :10:30 AM to 01:00 PM ctions: Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	Total Marks: 70	
Q.1	(a) (b)	Define and classify the thermodynamic systems in brief. State the second law of thermodynamics as per (i) Kelvin-Plank and (ii) Clausis, and prove that both statements are equivalent although they appear to be different.		07 07
Q.2	(a) (b)	List various power producing thermodynamic cycles and explain Carnot cycle. An engine works on Otto cycle has the pressure of 1 bar and 12 bar before and the end of compression stroke. Find the compression ratio and the air standard efficiency of the engine. Assume $\gamma=1.4$.		07 07
	(b)	OR Derive the expression for thermal efficiency for air stan prove that for maximum work ,the compression ratio sho (Assume $x=1.4$)	adard Otto cycle and build be $r = \left(\frac{T3}{T1}\right)^{1.25}$	07
Q.3	(a) (b)	What is steam nozzle? Explain the effects of friction on the steam nozzle. Explain in detail the super saturation phenomena in steam in	e flow through a nozzle.	07 07
Q.3	(a) (b)	OR What is meant by the term Jet Propulsion? Describe briefly th of a Turbo-Jet Engine. What is steam turbine? Differentiate between impulse and p	e working reaction turbine.	07 07
Q.4	(a) (b)	Explain Concept of black body And application heat transfer What are the different modes of heat transfer? Explain follo Transfer. (i)Fourier's law (iii)Stefan Boltzmann's law	er in heat exchanger. owing laws of heat	07 07
Q.4	(a) (b)	OR Explain multi stage compression. What are the advantages multistage compression? Classify the Gas Turbines.	of intercooler in	07 07
Q.5	(a)	Explain vapor compression refrigeration cycle with neat sk	etch.	07
	(b)	Write a short note on Logarithmic mean temperature differ	ence (LMTD).	07
Q.5	(a)	What is entropy? What do you mean by clausius inequality	?	07
	(b)	What are the advantages and disadvantages of air refrigerat	tion system?	07
