Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI- EXAMINATION – SUMMER 2016

Subject Code:160102 **Date:21/05/2016**

Subject Name:Fundamentals of Jet Propulsion

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.**

Q.1	**(a)**	Explain the critical and supercritical operations of ramjet diffuser.	**07**
	(b)	Compare the ram jet engine and turbojet engine.	**07**
Q.2	**(a)**	Write a short note on turbofan engine.	**07**
	(b)	Write a short note on supersonic inlets.	**07**
		OR	
	(b)	Write a short note on liquid propellant rocket engines.	**07**
Q.3	**(a)**	Define the given terms for the rocket engine. Propulsive efficiency, thermal efficiency, overall efficiency, SPC, and impulse for the rocket engine.	**07**
	(b)	With a neat sketch write a short note on scramjet engine.	**07**
		OR	
Q.3	**(a)**	Write a short note on boundary layer separation in diffuser.	**07**
	(b)	Explain any one liquid propellant feed system.	**07**
Q.4	**(a)**	Classify the rocket engines in brief.	**07**
	(b)	Write down the requirements of combustion chamber.	**07**
		OR	
Q.4	**(a)**	Explain effect of turbine inlet temperature and compressor pressure ratio for the turbojet engine.	**07**
Q.4	**(b)**	For the turbojet engine derive the expressions for the jet thrust and the propeller thrust.	**07**
Q.5	**(a)**	Explain the effect of back pressure on flow through convergent nozzle and convergent divergent nozzle.	**07**
	(b)	Derive the Mach-Area relation for the nozzle.	**07**
		OR	
Q.5	**(a)**	Explain the reheat cycle and intercooled cycle with T-S and P-V diagram.	**07**
	(b)	Explain in detail the flow through variable area ducts	**07**

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