Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI EXAMINATION – SUMMER 2025

Subject Code:3160102 Date:20-05-2025

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Give a comparison of Jet engines and Reciprocating engines.	**03**
	(b)	Define thrust, Propulsive efficiency, thermal efficiency and overall	**04**
	(c)	Explain the Turbojet Engine with neat sketch.	**07**
Q.2	**(a)**	Draw a neat sketch of turboprop engine and list out different components of it.	**03**
	(b)	Derive Thrust Equation for Turbojet Engine.	**04**
	(c)	Write a note on factors affecting the performance of combustion chamber.	**07**
		OR	
	(c)	Explain Can-Annular type combustion chamber with neat sketch.	**07**
Q.3	**(a)**	What do you mean by choking? When it occurs?	**03**
	(b)	Explain need for supersonic inlet.	**04**
	(c)	Derive Mach Area relation for variable duct and state its importance.	**07**
		OR	
Q.3	**(a)**	Explain the need of thrust augmentation.	**03**
	(b)	Explain the pulse jet engine with neat sketch.	**04**
	(c)	Derive Mach Area relation for nozzles.	**07**
Q.4	**(a)**	What are the factors affecting the net thrust development in ramjet engine?	**03**
	(b)	Draw and explain subsonic inlets in jet engines.	**04**
	(c)	Explain in detail diffuser operations of a ramjet engine.	**07**
		OR	
Q.4	**(a)**	Discuss Scramjet engine.	**03**
	(b)	Write a short note on needs of combustion chamber.	**04**
	(c)	Explain Brayton cycle with neat sketch also derive its efficiency.	**07**
Q.5	**(a)**	Derive expression for specific thrust, specific impulse and specific fuel consumption.	**03**
	(b)	Discuss in brief about Future Fuels and Energy Sources required in Sustainable Aviation.	**04**
	(c)	Discuss about the various factors affecting the performance of rocket engine.	**07**

OR

Q.5	**(a)**	Write a short note on turbo pump feed system for the rocket engine.	**03**
	(b)	Derive thrust equation for a rocket engine	**04**
	(c)	Explain Solid propellant and liquid propellant rockets with figure.	**07**

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