Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V EXAMINATION – SUMMER 2025

Subject Code:3150102 Date:28-05-2025

Subject Name:Fundamentals of Turbomachines

Time:02:30 PM TO 05:00 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)**	Define Rotor and Stator.	**03**
	(b)	What do you mean by Turbo machines?	**04**
	(c)	Difference between Turbomachines and Positive displacement machines.	**07**
Q.2	**(a)**	Define Fan and Blowers.	**03**
	(b)	Draw an inward flow radial turbine stage.	**04**
	(c)	Draw a velocity triangle for a two stage velocity compounded impulse turbine with maximum utilization factor.	**07**
		OR	
	(c)	Explain with appropriate graph of Zero degree reaction stage for axial turbine.	**07**
Q.3	**(a)**	Write an equation of **work** for axial turbine stage.	**03**
	(b)	Define choking and explain shortly.	**04**
	(c)	Explain DOR for axial flow compressor stage.	**07**
		OR	
Q.3	**(a)**	What is off design operation for axial compressor?	**03**
	(b)	Define surging and explain shortly.	**04**
	(c)	Draw and explain H-S diagram for flow through an axial compressor stage.	**07**
Q.4	**(a)**	Write an equation of Blade loading co-efficient for axial compressor.	**03**
	(b)	Write an equation of stage efficiency for centrifugal compressor.	**04**
	(c)	Draw performance characteristics of different types of centrifugal compressor. Explain	**07**
		OR	
Q.4	**(a)**	Draw a curve of Losses in the rotor of an IFR turbine stage.	**03**
	(b)	Explain DOR for centrifugal compressor stage.	**04**
	(c)	Draw and explain H-S diagram for flow through a centrifugal compressor stage.	**07**
Q.5	**(a)**	Discuss on Losses in rotating component.	**03**
	(b)	Write an equation of Spouting Velocity.	**04**
	(c)	Write a note on Turbine Blade Cooling techniques.	**07**
		OR	
Q.5	**(a)**	Difference between Axial and Radial Turbine.	**03**
	(b)	Explain with appropriate equation Cantilever Blade IFR Turbine.	**04**
	(c)	Explain General matching procedure of jet engines.	**07**

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