GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (OLD) - EXAMINATION – SUMMER 2017

Subject Code: 150102   **Date: 12/05/2017**
Subject Name: Fundamentals of Turbo M/cs
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.

Q.1	**(a)**	Draw h-s diagram for axial compressor stage.	**09**
	(b)	Classify the turbomachines and list the differences between axial and radial turbomachines.	**05**
Q.2	**(a)**	Draw the velocity triangles for different types of centrifugal compressor impellers.	**07**
	(b)	Explain the difference between turbomachines and reciprocating machines. Brief the application of turbomahcines.	**07**
		OR	
	(b)	Draw the complete h-s diagram for an axial turbine stage.	**07**
Q.3	**(a)**	Write a short note on surging and choking for turbomachines.	**07**
	(b)	What is slip factor? What is its effect on flow and pressure ratio in the stage? Derive the Stodola's relation for slip factor	**07**
		OR	
Q.3	**(a)**	Define degree of reaction and derive the expressions for maximum utilization factor for the impulse stage.	**07**
	(b)	Draw and explain the h-s diagram for the complete radial turbine stage.	**07**
Q.4	**(a)**	Draw and explain the velocity triangle for radial turbine stage.	**07**
	(b)	Explain the performance charts for an axial turbine stage.	**07**
		OR	
Q.4	**(a)**	List and explain the step wise procedure for to match compressor and turbines for the jet engine.	**07**
	(b)	Explain the procedure to draw equilibrium running diagram for turbomachines.	**07**
Q.5	**(a)**	Explain the losses in turbomachines.	**07**
	(b)	Write a short note on multistaging of turbine stages.	**07**
		OR	
Q.5	**(a)**	Write a short note on outward flow radial turbine.	**07**
	(b)	Draw h-s diagram for different reaction turbine stages.	**07**

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