Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– II(New course) • EXAMINATION (Remedial) – WINTER- 2015

Subject Code: 2722106 **Date: 10/12/2015**

Subject Name: COMPUTATIONAL FLUID DYNAMICS

Time:2:30 pm to 5:00 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 importance of CFD as design and research tool.	**07**
	(b)	Describe different types of errors in CFD.	**07**
Q.2	**(a)**	Describe different types of boundary conditions.	**07**
	(b)	Describe elliptic, parabolic and hyperbolic equation in brief.	**07**
		OR	
	(b)	Derive 2nd order derivative using central difference method for non-uniform grid.	**07**
Q.3	**(a)**	Which finite difference method is more accurate? Explain.	**07**
	(b)	Explain Lax Wandroff technique.	**07**
		OR	
Q.3	**(a)**	What are adaptive grids?	**07**
	(b)	Explain Mac-Cormackôs technique.	**07**
Q.4	**(a)**	Derive discretized solution for one dimensional steady state heat transfer for fin.	**07**
	(b)	Compare accuracy of Euler, Crank Nicholson and pure implicit method.	**07**
		OR	
Q.4	**(a)**	Derive discretized equation for two dimensional steady state heat transfer for square slab.	**07**
	(b)	Explain stability of numerical solution giving example.	**07**
Q.5	**(a)**	Explain in brief stream function vorticity method.	**07**
	(b)	Explain alternating direction implicit method.	**07**
		OR	
Q.5	**(a)**	Explain SIMPLE algorithm.	**07**
	(b)	Derive discretized equations for two dimensional transient heat conduction in a square plate.	**07**

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