Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – V (NEW) EXAMINATION – WINTER 2015

Subject Code: 2150104 **Date:10/12/2015**

Subject Name: Computational Fluid Dynamics-II

Time:10:30am to 1:00pm **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 SIMPLE method in detail. Also state advantages and disadvantages of SIMPLE.	**07**
	(b)	Why Linearization of the equations required? Explain The Beam and Warming Method.	**07**
Q.2	**(a)**	What is FVM stands for? With the help of diagram, write a note on FVM with a suitable example.	**07**
	(b)	Write down steps involved in SIMPLE-R method. How it differs from SIMPLE?	**07**
		OR	
	(b)	What is Boundary Condition? What are the Basic types of Boundary Conditions? Explain it with a suitable diagram.	**07**
Q.3	**(a)**	Why development of Upwind Scheme was needed? Explain first order upwind scheme in detail.	**07**
	(b)	State disadvantages of 1st Order Upwind Scheme. Explain Flux Vector Splitting.	**07**
		OR	
Q.3	**(a)**	Explain Finite Volume Method for One dimensional Unsteady heat conduction.	**07**
	(b)	What is Shock Layer? Explain the concept of Supersonic flow over a sharp edged flat plate with a proper diagram.	**07**
Q.4	**(a)**	Explain SIMPLE-C method in detail. List the advantages and disadvantages.	**07**
	(b)	Write a short note on PISO algorithm. State the advantages and disadvantages.	**07**
		OR	
Q.4	**(a)**	Write a note on TAUXY function subprogram.	**07**
	(b)	Write a note on FVM for two dimensional diffusion problem.	**07**
Q.5	**(a)**	Derive the governing flow equations for the problem of supersonic flow over a flat plate.	**07**
	(b)	Write a short note on High Resolution Schemes.	**07**
		OR	
Q.5	**(a)**	Write a short note on The Godunov Approach with the help of the shock tube problem.	**07**
	(b)	Discuss the initial and boundary conditions for two dimensional unsteady, supersonic, viscous flow over the flat plate.	**07**

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