GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2021

Subject Code:2150104   **Date:04/09/2021**
Subject Name:Computational Fluid Dynamics II
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)	Define Boundary Condition? Explain Inlet Boundary Conditions.	03
	(b)	With neat sketch explain need of Staggered grid.	04
	(c)	Write a note on SIMPLE.	07
Q.2	(a)	How solution of Incompressible flow problems is different than Compressible flow problems?	03
	(b)	Write a note on symmetry and periodic boundary conditions.	04
	(c)	Compare SIMPLE, SIMPLE-R and PISO.	07
		OR	
	(c)	Explain steps of PISO.	07
Q.3	(a)	Why under relaxation is required in SIMPLE?	03
	(b)	State the disadvantage of SIMPLE and explain SIMPLE-C.	04
	(c)	Explain FVM for One-Dimensional unsteady heat conduction problem.	07
		OR	
Q.3	(a)	How step size is calculated for the flow over a flat plate?	03
	(b)	Suggest suitable Boundary conditions for supersonic viscid flow over the flat plate.	04
	(c)	Draw the flow chart for Mac-Cormark subroutine	07
Q.4	(a)	Write the advantages of PISO.	03
	(b)	Explain Central differencing Scheme.	04
	(c)	Explain finite volume method (FVM) for two dimensional diffusion problems.	07
		OR	
Q.4	(a)	What is Nonlinearity? Why linearization is required?	03
	(b)	Explain TDMA.	04
	(c)	Explain Flux Vector Splitting.	07
Q.5	(a)	What is Upwind Scheme?	03
	(b)	Compare 1st and 2nd Order upwind schemes.	04
	(c)	Write a note on Multidimensional problem.	07
		OR	
Q.5	(a)	What is TVD scheme?	03
	(b)	Explain Crank Nicholson scheme.	04
	(c)	Explain Beam and Warming method.	07

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