GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V(NEW) EXAMINATION – SUMMER 2022

Subject Code:2150104   **Date:20/06/2022**

Subject Name:Computational Fluid Dynamics II

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)	What is Boundary Condition? State its importance in CFD.	03
	(b)	Write full form of SIMPLE, SIMPLE-R, SIMPLE-C and PISO.	04
	(c)	Explain SIMPLE algorithm in detail.	07
Q.2	(a)	What is Wall Boundary condition? Explain No-slip condition with example.	03
	(b)	Why solution of incompressible flow problems is more complex compared to compressible flow?	04
	(c)	Explain Finite Volume Method for One dimensional Unsteady heat conduction.	07

OR

	(c)	Explain Inlet and Outlet boundary condition.	07
Q.3	(a)	How multidimensionality does make the solution of equation more difficult?	03
	(b)	Explain symmetry and periodic boundary conditions	04
	(c)	Compare SIMPLE, SIMPLE-R & PISO	07

OR

Q.3	(a)	Compare SIMPLE and SIMPLE-C.	03
	(b)	Explain Crank-Nicolson Scheme	04
	(c)	Write a short note on High Resolution Schemes.	07
Q.4	(a)	What is TVD condition? Explain.	03
	(b)	Explain finite volume method (FVM) for two dimensional diffusion problems.	04
	(c)	Explain steady one dimensional convection and diffusion problem	07

OR

Q.4	(a)	What is Nonlinearity? Why linearization is required?	03
	(b)	Explain Flux Vector Splitting.	04
	(c)	Explain Beam and Warming method.	07
Q.5	(a)	Explain concept of Upwind schemes.	03
	(b)	How will you calculate of step size in flow over a flat plate?	04
	(c)	Explain flow chart for Mac-Cormark subroutine for viscous supersonic flow over a flat plate.	07

OR

Q.5	(a)	Why under relaxation is required in SIMPLE method?	03
	(b)	What is TDMA? Explain.	04
	(c)	Compare staggered grid with conventional grid. Explain its importance in solving pressure velocity coupling problems.	07

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