		No	
		GUJARAT TECHNOLOGICAL UNIVERSITY	
		M. E SEMESTER – II • EXAMINATION – SUMMER • 2014	
Subject code: 1721005 Date: 23-06-2014			
Subject Name: Computational Fluid Dynamics			
Tir	me: 02	2:30 pm - 05:00 pm Total Marks: 70	
Ins	struc	tions:	
	1.	Attempt all questions.	
	2.	Make suitable assumptions wherever necessary.	
	3.	Figures to the right indicate full marks.	
Q.1	(a)	How is CFD being used as a research tool, a design tool, and an educational tool in academic fields, such as thermal fluids?	07
	(b)	Derive integral form of Navier-Stokes equation.	07
0.2	(a)	Write a note ó õGrid Generation in CFD Analysisö.	07
x	(b)	Explain Finite Element Philosophy in brief.	07
		OR	
	(b)	Explain all types of the finite difference formulations for 1 st Order partial derivatives and discuss the consistency, stability and convergence of the finite difference method.	07
Q.3	(a)	Write a note ó õIsoperimetric elementsö.	07
	(b)	Explain following terms:	07
		(1) Convergence, (2) Discretization, (3) Consistency. OR	
Q.3	(a)	Explain simple algorithm for viscous incompressible flow.	07
	(b)	Derive integral form of Euler & equation of motion.	07
Q.4	(a)	Discuss validation of CFD models.	07
	(b)	Explain explicit and implicit finite difference scheme. OR	07
Q.4	(a) (b)	Write a Short note on approximation and simplification of governing equation. Discuss the basic rules for Semi Implicit method for Pressure Linked Equation method.	07 07
Q.5	(a)	Describe the K- Model of turbulence flow modeling.	07
-	(b)	Explain various reasons for occurrence of various types of errors found between computational results and experimental results.	07
Q.5	(a)	Derive incompressible viscous flow equations for 2D system using Marker and Cell method	07
	(b)	What is turbulence? Explain need of turbulence model with example.	07
