## GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II– EXAMINATION – WINTER - 2016			
Sul	bject	Code: 2722106 Date: 19/11/20	16
Subject Name: Computational Fluid Dynamics			
Tir	Time: 2:30 pm to 5:00 pm Total Marks: /		
Inst	rucuo 1.	Attempt all questions.	
	2.	Make suitable assumptions wherever necessary.	
	3.	Figures to the right indicate full marks.	
Q.1	(a) (b)	What is CFD ? Explain the working steps of CFD. Explain the physical meaning of divergence of the velocity.	07 07
Q.2	(a) (b)	By using governing equation explain Unsteady thermal conduction. Derive second order central difference equation for the mixed derivative.	07 07
	<b>(b)</b>	By using one dimensional heat conduction equation derive the Crank-Nicolson form governed by parabolic equation.	07
Q.3	<b>(a)</b>	Write Laplace's equation. Transform it from (x,y) to ( $\zeta$ , $\eta$ ), where $\zeta = \zeta(x,y)$ and	07
	<b>(b</b> )	$\eta = \eta(x,y).$ Write short note on Adaptive grids.	07
03	(a)	<b>UK</b> Explain in brief elliptically generated boundary fitted grid	07
Q.3	(a) (b)	Explain in brief Lax-Wendroff technique.	07
Q.4	(a) (b)	Explain in brief Maccormack's technique. Explain SIMPLEC algorithm.	07 07
		OR	
Q.4	(a) (b)	Explain FVM for one dimensional steady state diffusion problem. Explain Conservativeness - the property of discretization scheme.	07 07
Q.5	(a) (b)	Explain FVM for one dimensional steady state convection-diffusion problem. Explain in brief the upwind differencing scheme. <b>OR</b>	07 07
Q.5	(a) (b)	Write short note on Staggered grid. Explain Tri Diagonal Matrix Algorithm in brief.	07 07

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