

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– VII EXAMINATION – SUMMER 2026

Subject Code:3170109

Date:29-05-2026

Subject Name:Advance Computational Fluid Dynamics

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) Define Computational Fluid Dynamics in technical words.	03
(b) Define Uniform grid and Non-Uniform grid with sketch.	04
(c) How does CFD code work? Explain	07
Q.2 (a) List out different types of solver. Define Residual	03
(b) Explain turbulent flow characteristics.	04
(c) Explain Finite Volume method with appropriate sketch.	07
OR	
(c) Explain Finite Difference method with appropriate sketch.	07
Q.3 (a) What is Multi block structured grid?	03
(b) Discuss on Algebraic methods.	04
(c) Write a note on periodic or cyclic boundary condition.	07
OR	
Q.3 (a) What is Bowyer Algorithm?	03
(b) Why boundary condition is required in CFD? Discuss	04
(c) What are the difference between Inlet and Outlet Boundary Condition? Discuss in brief	07
Q.4 (a) What is RSM?	03
(b) Discuss on mixing length model.	04
(c) Derive Reynolds average Navier stokes (RANS) equation.	07
OR	
Q.4 (a) Why Grid is required to solve the problem?	03
(b) Discuss Eddy viscosity models.	04
(c) Write a note with appropriate equation on κ - ϵ model.	07
Q.5 (a) How to decided turbulence model in CFD?	03
(b) Discuss on SST model.	04
(c) Write a note on RNG model.	07
OR	
Q.5 (a) Shortly discuss LES.	03
(b) Discuss on Explicit method.	04
(c) Write a note on DNS.	07
