

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: CHEMICAL ENGINEERING**

**SEMESTER : VI
SESSION : SP/2025**

SUBJECT: CL371 COMPUTATIONAL FLUID DYNAMICS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
-

		CO	BL
Q.1(a)	Write the energy transport equation and identify the bulk transport, molecular transport, and source terms.	[5] 1	1
Q.1(b)	Correlate Navier-Stokes equation with the generic form of PDE and identify whether it is parabolic, elliptic, or hyperbolic.	[5] 4	3
Q.2(a)	What is adaptive meshing? State with an example.	[5] 3	1
Q.2(b)	Show C-type meshing for an airfoil.	[5] 3	1
Q.3(a)	State the "Golden rules" for SIMPLE.	[5] 2	2
Q.3(b)	What are the differences between SIMPLE and SIMPLER algorithms.	[5] 1	3
Q.4	State the line-by-line TDMA algorithm	[10] 2	2
Q.5	State the 1D heat conduction equation with source term and fit into the "Magic form". State the importance of this particular form in this context for obtaining the solution.	[10] 4	4

:::29/04/2025:::M