BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: B. TECH. **SEMESTER : V**
BRANCH: MECH. **SESSION : MO/2023**

SUBJECT: ME353 COMPUTATIONAL FLUID DYNAMICS

TIME: 02 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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			CO	BL
Q.1	Describe different models of the flow to analyze a fluid motion.	[5]	CO1	II
Q.2	Convert the non-conservation form of x-momentum equation $\rho Du/Dt = -\partial p/\partial x + \partial \tau_{xx}/\partial x + \partial \tau_{yx}/\partial y + \partial \tau_{zx}/\partial z + \rho f_x$ to conservation form.	[5]	CO1	III
Q.3	Briefly discuss on the equilibrium and marching problems with suitable example.	[5]	CO2	II
Q.4	Classify the steady two-dimensional velocity potential equation for flow past a slender body, $(1 - M^2)\partial^2\varphi/\partial x^2 + \partial^2\varphi/\partial y^2 = 0$ where, M is Mach number.	[5]	CO2	III
Q.5	Explain the Dirichlet and Neumann boundary conditions with some physical example.	[5]	CO2	II

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