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

CLASS: B. TECH **SEMESTER: VII**
BRANCH: CHEMICAL/ CHEMICAL (P&P) **SESSION: MO/2022**

SUBJECT: CL424 MICROFLUIDICS

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	Explain point value in continuum fluid mechanics.	[2]	CO1	L1
Q1	(b)	Write short notes on microelectromechanical systems (MEMS).	[3]	CO1	L2
Q2		Derive Navier-Stoke equation from Navier's equation of equilibrium.	[5]	CO1	L4
Q3	(a)	Define: Contact angle, surface tension.	[2]	CO1	L1
Q3	(b)	Derive the Young-Laplace equation	[3]	CO2	L4
Q4	(a)	How will you apply Knudsen number to characterize fluid flow?	[2]	CO1	L2
Q4	(b)	Show that the rise in capillary height is inversely proportional to the radius of capillary tube.	[3]	CO2	L3
Q5	(a)	How inertia force affects the dynamics of surface driven flow? Mention the assumptions and limitation related to the model.	[2]	CO2	L2
Q5	(b)	Mention the different methods to control surface tension and capillary force in a microfluidic channel.	[3]	CO2	L3

:::::: 26/09/2022 ::::::M