



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: MEC	Pattern: 2023
Name of Course: Fluid Mechanics and Machines	Course Code: 2305212
Max. Marks: 30	Duration: 1.15 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

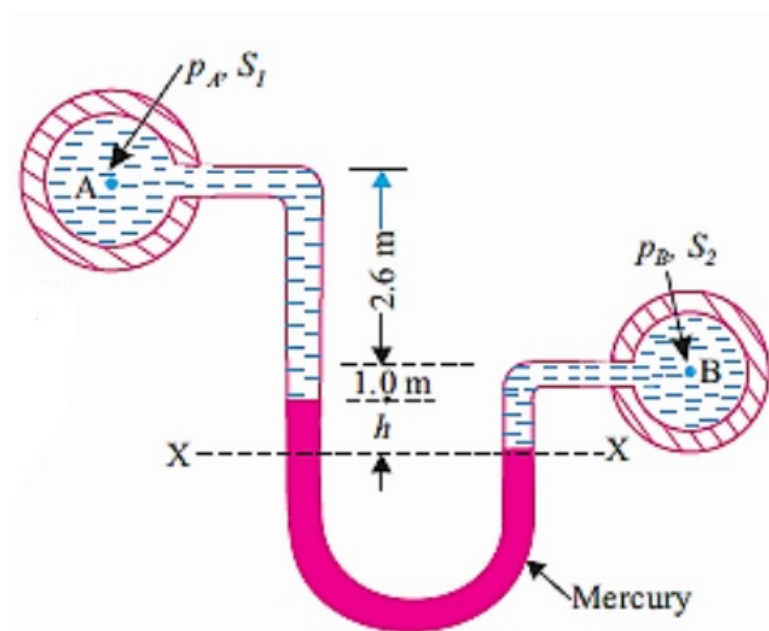
**Marks CO**

**Question No. 1**

- 1 a) Define surface tension and Capillarity with examples. Also derive an expression for the capillarity rise. (7) CO1

**Question No. 2**

- 2 a) Define Hydrostatic law. Explain how pressure is measure with the simple U tube Manometer with neat sketch. Fig shows a U-tube differential manometer connecting two pressure pipes at A and B. The pipe A contains a liquid of specific gravity 1.6 under a pressure of  $110 \text{ kN/m}^2$ . The pipe B contains oil of specific gravity 0.8 under a pressure of  $200 \text{ kN/m}^2$ . Find the difference of pressure measured by mercury as fluid filling U-tube. (8) CO2



**OR**

2 b) Enlist the different types of fluids.

(8) CO1

A cylinder 0.12m radius rotates concentrically inside a fixed cylinder of 0.13 m radius. Both cylinders are 0.3m long. Determine the viscosity of liquid which fills the space between the cylinders, if a torque of 0.88 Nm is required to maintain an angular velocity of  $2\pi$  rad / sec.

**Question No. 3**

3 a) Explain the terms with neat sketches: a) Pathline b) Streamline c) Streakline  
d) Streamtube

(7) CO3

**Question No. 4**

4 a) Define velocity potential function.

(8) CO3

Velocity potential function for a 2-D flow is  $\phi = x(2y-1)$ . At a point (4, 5), determine the velocity. Also find out the given flow is possible or not.

**OR**

4 b) Derive the expression for continuity equation in three dimensional flow.

(8) CO3

..... End of question paper.....