Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 08-10-2025 **Time:** 09.30am to 11.00am

School: SOE	**Program:** B. Tech. (Mechanical)	
Course Code: MEC2502	**Course Name:** Fluid Mechanics and Machinery	
Semester: III	**Max Marks:** 50	**Weightage:** 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**20**	**30**	**-**	**-**	**-**

Instructions:

(i) ***Read all questions carefully and answer accordingly.***

(ii) ***Do not write anything on the question paper other than roll number.***

(iii) ***Use of Design Data Handbook permitted.***

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	If a person studies about a fluid which is in motion considering forces acting on them, what will you call his domain of study?	**2 Marks**	**L1**	**CO1**
2	Define the term viscosity.	**2 Marks**	**L1**	**CO1**
3	What is microscopic approach of fluid?	**2 Marks**	**L1**	**CO1**
4	Write the relationship between dynamic and Kinematic viscosity.	**2 Marks**	**L1**	**CO1**
5	Define specific gravity.	**2 Marks**	**L1**	**CO1**

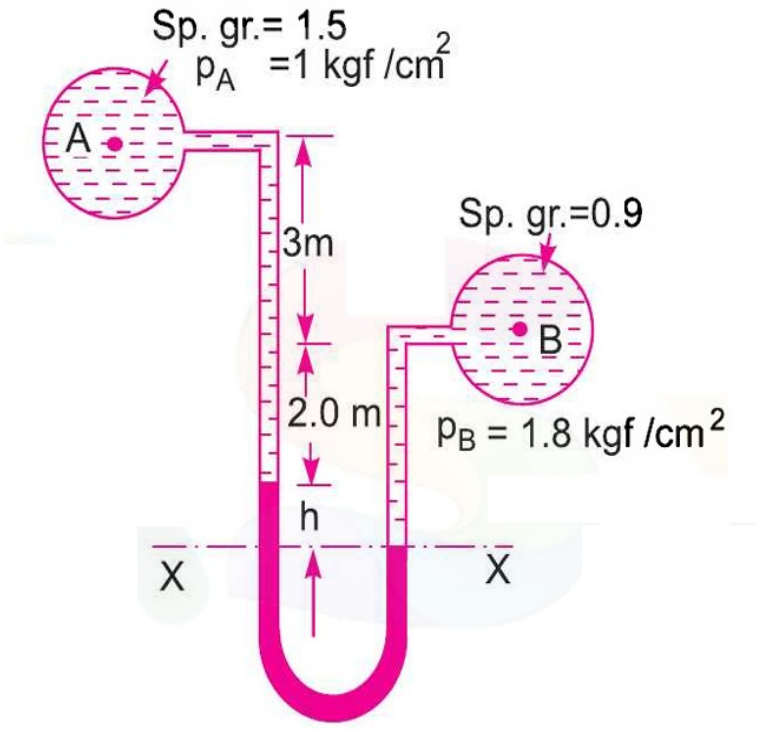
Part B

Answer ALL Questions. Each question carries 10 marks.					4QX10M=40M
6	a.	Explain the capillarity effect and provide the equations for capillary rise and fall.	5 Marks	L2	CO1
	b.	Explain Newtons law of viscosity with a neat sketch.	5 Marks	L2	CO1
		or			
7	a.	Explain Pascals law and its applications.	5 Marks	L2	CO1
	b.	If $5m^3$ of certain oil weighs 30kN. Calculate specific weight, specific gravity and mass density of the oil.	5 Marks	L2	CO1

8	Explain the relationship between Absolute, Gauge, Atmosphere and Vacuum pressure with a neat sketch.	10 Marks	L2	CO2
	or			
9	Deduce the relationship between bulk modulus and compressibility.	10 Marks	L2	CO2

10	Assume a cubical block of 30 cm side of 30 kg weight is allowed to slide down along a plane incline at 40 degrees to the horizontal on which there is a film of oil having viscosity of 2.16x10-3 N-s/m^2. What will be the terminal velocity of the block if the film thickness is 0.3mm	10 Marks	L3	CO1
	or			
11	Assume a hydraulic lift consists of a 40 cm diameter ram and slides in a cylinder of diameter 50 cm, while the annular space is being filled up with oil having kinematic viscosity of 0.03cm^2/s and specific gravity of 0.85. If the rate of travel of the ram is 9.15m/min, find the frictional resistance when 3.85 m of ram is engaged in the cylinder.	10 Marks	L3	CO1

12	A U-tube differential manometer is used to measure the pressure difference between two points A and B in a pipeline. The manometer contains mercury and water. The left limb of the manometer, connected to point A, contains water up to a height of 0.6 m. The right limb, connected to point B, contains mercury with a height difference 0.2m between the two limbs. Calculate the pressure difference between the pipe A and B.	10 Marks	L3	CO2
	or			

13	 **Find h.**	**10 Marks**	**L3**	**CO2**