PARUL UNIVERSITY FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech Mid Semester Exam

Semester: 4th

Subject Code: 303109253
Subject Name: Fluid and Mechanics and Machines

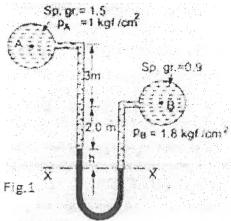
Date: 30/01/2024 Time: 1hr: 30min **Total Marks: 40**

Sr.		Marks
No.		05
Q.1	(A) Five One line Questions	
	(1) Capillarity action is due to cohesion only. True or False(2) Define: Kinematic viscosity	
	(3) The specific gravity of oil whose density is 745 kg/m ³ , is	
	(4) What is the height of a water column equivalent to a pressure of 3.65 bar?	
	(5) Surface tension is defined as the tensile force acting on the surface of a liquid in contact with a gas or on the surface between two immiscible liquids. True or False	
	(B) Five Fill in the blanks	05
	(1) The coefficient of discharge for the Venturimeter is always less than	
	(2) The CGS unit of Kinematic viscosity is	
	(3) The rise of kerosene through a cotton wick inserted into the reservoir of a kerosene	
	lamp is due to (4) $1 \text{ m}^3 =$ liters	
	(5) Pitot tube measures the at any point.	
Q.2	Attempt any four(Short Questions)	12
	(1) Define: Specific volume, viscosity and bulk modulus of elasticity.	
	(2) Determine the atmospheric pressure at a location where the barometric reading is 740	
	mmHg and the gravitational acceleration is $g = 9.805 \text{ m/s}^2$. Assume the temperature	
	of mercury to be 10°C, at which its density is 13,570 kg/m ³ . (3) Explain Newton's Law of Viscosity.	
	(4) The IV fluid and the blood pressures balance each other when the bottle is 1.2 m above	
	the arm level, the gauge pressure of the blood in the arm is simply equal to the gauge	
	pressure of the IV fluid at a depth of 1.2 m.	
	(5) What is the Fluid Mechanics?	
Q.3	Attempt any two questions	08
	(1) Define: (i) Surface tension (ii) Capillary rise and fall.	
	(2) Explain the Orifice meter with a schematic diagram.	
	(3) Explain the U-tube manometer for measuring a gauge pressure or vacuum pressure.	
		05
Q.4	(A) Derive the Continuity Equation in Cartesian coordinates.	05
	(B) Oil of sp. Gravity 0.8 is flowing through a Venturimeter having an inlet diameter of 20 cm and a throat diameter of 10 cm. The oil mercury differential manometer shows a	U.S

reading of 25 cm. Calculate discharge of oil through Venturimeter. Take Coefficient of discharge = 0.98.

OR

(B) A differential manometer is connected at two points A and B of two pipes as shown in fig.1. The pipe A contains a liquid of specific gravity = 1.5 while pipe B contains a liquid of specific gravity = 0.9. The pressure at A and B are 1 kgf/cm2 and 1.80 kgf/cm2 respectively. Find the difference in mm level in the differential manometer.



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