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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
MID TERM EXAMINATION - OCT 2023**

**Semester :** Semester III - 2022

**Course Code :** MEC2010

**Course Name :** Sem III - MEC2010 - Fluid Mechanics

**Program :** B. TECH

**Date :** 30-OCT-2023

**Time :** 2:00PM - 3:30PM

**Max Marks :** 50

**Weightage :** 25%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

**PART A**

**ANSWER ALL THE FIVE QUESTIONS**

**5 X 2=10M**

1. Define Fluid Mechanics and classify the same.  
(CO1,CO2) [Knowledge]
2. Which of the following is called as Potential energy?
  - 1) Pressure energy
  - 2) Kinetic energy
  - 3) Datum energy
  - 4) Total energy(CO1,CO2) [Knowledge]
3. Which devices are used for measuring pressure and velocity.  
(CO1,CO2) [Knowledge]
4. Write the statement for Bernoullis equation.  
(CO1,CO2) [Knowledge]
5. What does the continuity equation state?  
(CO1,CO2) [Knowledge]

**PART B**

**ANSWER ALL THE TWO QUESTIONS**

**2 X 10 = 20M**

6. Define the term Compressibility and Bulk Modulus. Also deduce the equation for both with an example.  
(CO2,CO1) [Comprehension]

7. Deduce the relationship between Absolute, Gauge, Atmospheric and Vacuum pressures with a neat sketch.

(CO2,CO1) [Comprehension]

### PART C

#### ANSWER THE FOLLOWING QUESTION

1 X 20 = 20M

- 8.a) The diameter of a small piston and large piston of a hydraulic jack are 3cm and 6cm respectively. A force of 40N is applied on the small piston. Find the load lifted by large piston, When the pistons are at same level and when the small piston is 20cm above the large piston. The specific gravity of the liquid in the jack is 1.5. (CO2,
- 8.b) A differential manometers is connected at two points P and Q. The pipe P contains liquid of specific gravity 12, while pipe Q contains liquid of specific gravity 0.8. The pressure at point P and Q are 1.3 kgf/cm<sup>2</sup> and 2.4 kgf/cm<sup>2</sup> respectively. Find the diference in mercury level in the differential manometer with a neat sketch. Assume the center of pipe P and Pipe Q are (4+h) m and 6m respectively from the reference. (CO1,