

Find the pressure of fluid in the pipe if the difference of mercury level in two limbs is 20cm.

10

3. State Hydrostatic law. Derive the relation between absolute pressure and gauge pressure. A hydraulic press with a large piston diameter 35cm at a height of 1.5m relative to the smaller piston of diameter 10cm. The mass on the smaller piston is 2kg. What is the force exerted on the load by the larger piston. The density of oil in the press is 750kgm^{-3} . 10
4. State and prove Pascal's law. Give some examples where this principle is applied. 10
5. What is piezometer? What are the advantages & disadvantages of piezometer? What are the gauge pressure and absolute pressure at a point 6m below the surface of a liquid having a density of $1.5 \times 10^3 \text{kgm}^{-3}$ if the atmospheric pressure is equivalent to 75cm of Hg? Sp. Gravity of Hg = 13.6 and density of water is 1000kgm^{-3} . 10
6. What are the different types of Notch? A right angled V notch is used for measuring discharge of 30 lps. An error of 2mm was made for measuring the head over the notch. Calculate the discharge as well as the error. 10
7. State & prove Bernoulli's theorem. Derive Bernoulli's theorem from Euler theorem. 10
8. State Newton's law of viscosity. What are the different types of fluid? Explain the conditions of floating and submerged bodies. 10

B. Tech Odd Semester Examination, February, 2023

Agricultural Engineering

(3rd Semester)

Course No.: AE-301

(Fluid Mechanics)

Full Marks: 50

Pass Marks: 25

Time: 2 hours

- Note:**
1. Attempt any five questions.
 2. Begin each answer in a new page.
 3. Answer parts of a question at a place.
 4. Assume reasonable data wherever required.
 5. The figures in the right margin indicate full marks for the question.
 6. All the mathematical symbols and abbreviations have their usual meanings.

1. Write Short notes on:

- | | |
|----------------------|---------------------|
| i) Gauge pressure | ii) Cavitation |
| iii) Specific volume | iv) Stress |
| v) Viscosity | vi) Surface tension |
| vii) Buoyancy | viii) Upthrust |
| ix) Pitot tube | x) Venturimeter 10 |

2. What is manometer? What are its types? Give their advantages and disadvantages. The right limb of a single U-tube manometer contains mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.9 is flowing. The centre of the pipe is 12cm below the level of mercury in the right limb.

Turn Over