

Question Bank

Unit Test I

Program: Mechanical Engineering

Course – FMM

Semester: ME4I

Course Code- FMM (22445)

UNIT 1-PROPERTIES OF FLUID AND PRESSURE MEASUREMENT

QUESTIONS FOR 2 MARKS

1. Define the viscosity and surface tension.
2. Define the terms kinematic viscosity, dynamic viscosity in case of hydraulic fluid
3. Define the terms weight density, mass density and specific gravity and specific volume.
4. State newton's law of viscosity.
5. State the SI units of:
 - a) Kinematic viscosity.
 - b) Dynamic viscosity.
6. Define Total pressure and center of pressure.
7. Define atmospheric pressure and absolute pressure.
8. A open tank contains water up to depth of 2 and above it an oil of specific gravity 0.9 for a depth of 1m find the pressure intensity.

QUESTIONS FOR 4 MARKS

1. One liter of crude oil weight 9.6N.calculate its specific weight and density.
2. Convert 40m of oil column into pressure in N/cm².Take specific gravity of oil as 0.8
3. Differentiate between Dynamic viscosity and kinematic viscosity.
4. Differentiate between simple manometer and differential manometer
5. Explain Bourdon's tube pressure gauge with neat sketch
6. Draw the neat sketch of inverted U-Tube manometer and state its use.

7. A circular lamina 2m in diameter is immersed in water so that the distance of its perimeter measured vertically below the water surface varies between 1m and 2.5m. find the total force due to water acting on one side of lamina and the vertical depth of the center of pressure.

8. An isosceles triangular plate having base 1.4 m and height 2.3m is immersed vertically in such a way that, the apex is in downward direction and the side of base is parallel and 40cm below free water surface level determine total pressure and center of pressure.

UNIT 2-FLUID FLOW

QUESTIONS FOR 2 MARKS

1. State law of continuity.
2. State and prove Bernoulli's theorem for flow of fluids
3. Define rotational and irrotational flows
3. Define laminar and turbulent flow
4. State four limitation of Bernoulli's theorem.

QUESTIONS FOR 4 MARKS

1. Explain construction and working of venturimeter.
2. Explain construction and working of orifice meter.
3. A 30cm x 15cm Venturimeter is inserted in vertical pipe carrying water flowing in upward direction. A differential manometer connected to the inlet and throat gives a reading of 20cm find the discharge take $C_d=0.98$.
4. Pitot tube directed into a water stream having a velocity of 2.7 m/sec it has a gauge difference of 30 mm on mercury water manometer. Find the find the coefficient of velocity.

UNIT 3- FLOW THROUGH PIPES

QUESTIONS FOR 2 MARKS

1. State laws of friction
2. State Darcy's and Chezy's equation.
3. What are different losses in pipes?

QUESTIONS FOR 4 MARKS

1. Find the head lost due to friction in a pipe of 300 mm and length 50m through which water is flowing at a velocity of 3m/sec using,

a) Darcy's formula

b) Chezy's formula ($C=60$ and $f=0.0256$)

2. A pipe of 15 cm is suddenly enlarged to 30cm diameter. The discharge through the pipe is 9 cubic meter. Calculate the loss of head.

3. Explain TEL and HGL with sketch.

4. Explain Water hammer? State its effects and remedies.