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Kharghar, Navi Mumbai - 410 210.

DEPARTMENT OF AUTOMOBILE ENGINEERING

VISION

"To develop technically skilled engineers with value-based education in the automotive industry to face upcoming chances".

MISSION

- *Understanding the need for regional automotive industries.*
- *Provide hands on skills for lifelong professional development.*
- *To create responsible students with a sense of ethics & discipline.*

Subject Name: Fluid Mechanics and Machinery (313309) **Date :-**

Assignment No: - 1 **Course Outcome: 302.1**

Topic Name :- Properties of Fluid and Fluid Pressure Measurement

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Q.1 Define viscosity, viscosity index, Surface tension, Pascal's Law.

Q.2 Explain a simple U-tube differential manometer with a neat sketh.

Q.3 List different properties of fluid.

Q.4 For a water column of height 8m, Calculate –

i. Intensity of pressure (KPa)

ii. Pressure in mm of Hg

Q.5 Draw sketch of Bourdon tube pressure gauge and state its advantages.

Q.6 The circular plate of 1.6 m diameter is immersed vertically in water such that its centre is 4 m below the free water surface. Find depth of centre of pressure and total pressure.

Q.7 Calculate pressure difference between liquids of pipe A and pipe B for differential manometer. Pipe A contains liquid of specific gravity 0.8 and pipe B contains liquid of specific gravity 1.15. The difference in mercury level is 30 cm. The Level of mercury is 30 cm below pipe B in the left limb and 50 cm below pipe A in the right limb.

Assign By :- Mr. Pravin Biramane

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Subject Name: Fluid Mechanics and Machinery (313309) **Date :-**

Assignment No :- 2 **Course Outcome: 302.2**

Topic Name :- Fundamentals of Fluid Flow and Flow Measurement

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1. State the types of fluid flow.
2. State laws of fluid friction for laminar flow
3. Describe with neat sketch, construction and working principle of orifice meter.
4. State the Continuity theorem and equation with the meaning of each term for incompressible flow.
5. Derive the equation of actual discharge through the venturimeter and orificemeter.
6. A horizontal venturi meter 160 mmx80 mm is used to measure the flow of an oil of specific gravity 0.3 .Determine the deflection of oil mercury gauge if discharge of oil is 50 lit/sec. Take Cd=1.
7. A 30 cm of pipe carrying water branches into two pipes of 20 cm and 15 cm diameter. If the mean velocity in the 30 cm pipe is 2.5m/s find the discharge in the pipe. Also find velocity in 15 cm pipe if mean velocity in 20 cm pipe is 2 m/s.

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Subject Name: Fluid Mechanics and Machinery (313309) **Date :-**

Assignment No :- 3 **Course Outcome: 302.3**

Topic Name :- Flow through Pipes

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1. Explain the laws of fluid friction for turbulent flow.
2. Explain Darcy's and chezys equation for frictional losses.
3. Write the equation of power transmission by fluid in the pipe and obtain the condition for maximum power transmission.
4. Explain H.G.L. and T.E.L. with a neat sketch.
5. Pipe diameter 25 cm is suddenly enlarged to a diameter of 50 cm . If the pipe carries 350 lit/sec, find loss of head due to expansion.
6. The pressure at the inlet of a pipeline is 1000KPa and pressure drop 200KPa.The [pipeline is 1.5Km long.If 100 KW is to be transmitted over this pipeline ,find the diameter of the pipe and efficiency of transmission.Take f=0.006.

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Subject Name: Fluid Mechanics and Machinery (313309) **Date :-**

Assignment No :- 4 **Course Outcome: 303.4**

Topic Name :- Hydraulic Turbines

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1. Define impact of jet and jet propulsion.
2. Draw a neat sketch of the impact of the jet on a fixed vertical plate and write the formula to determine force exerted.
3. A horizontal jet of water is delivered under an effective head of 25 m.Calculate the diameter of the jet ,if the force exerted by the jet on a vertical fixed plate is 2.22KN. Take coefficient of velocity is 0.99
4. Explain general layout of Hydraulic power plant.
5. State the functions of the draft tube in the reaction turbine.
6. Define cavitation in turbines.

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Subject Name: Fluid Mechanics and Machinery (313309) **Date :-**

Assignment No :- 5 **Course Outcome: 302.5**

Topic Name :- Centrifugal and Reciprocating Pumps

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1. Define tidal head and manometric head.
2. What are multistage pumps?Explain construction and working of a multistage pump.
3. A centrifugal pump has the following characteristics : Outer diameter of impeller = 900 mm; wide of impeller vanes at outlet = 40°. The impeller runs at 650 rpm and delivers 1.2 cubic meters of water per second under an effective head of 45 m. A 500 kW motor is used to drive the pump. Determine the manometric, mechanical and overall efficiencies of the pump. Assume water enters the impeller vanes radially at the inlet.
4. Discuss the factors considered for selection of pump.
5. Draw indicator diagram for reciprocating pump showing the effect of accelerating head and frictional head.

Assign By :- Mr. Pravin Biramane