Universiti Malaysia PAHANG
Engineering • Technology • Creativity

Fluid Mechanics

Assignment I

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Assignment I

Ques. No	CO	COURSE OBJECTIVES	TOTAL MARKS
1 – 2	CO1	Define fluid properties and the fundamentals of fluid mechanics concept	40
3 – 4	CO2	Explain fluid mechanics system and devices such as capillary, manometers, and piezometer	40
5	CO3	Apply fluid mechanics theories such as Bernoulli's theorem , continuity equation, Darcy-Weisbach equation and Reynold's number in fluid mechanics system.	20
		TOTAL	100

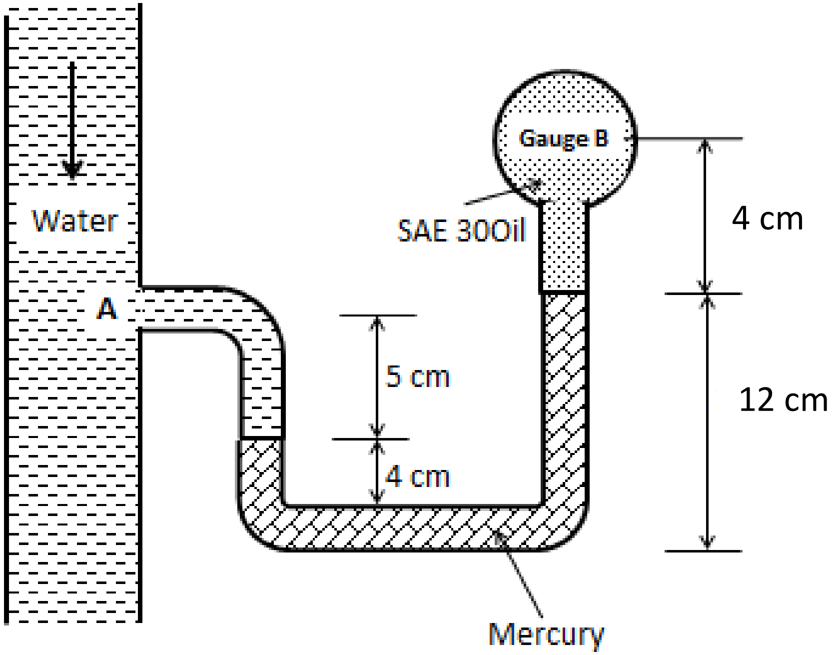
Assignment I

- Question 1
  - Solid, liquid and gas are three states of matter of fluid. List FOUR (4) differences between liquid and gas.

- Question 2
  - A liquid has a volume of 4300 L and weighs 24 kN. By assuming missing data suitably, compute:
    - Specific weight, γ
    - Mass density, ρ
    - Specific volume, V_s
    - Specific gravity, *Sg*

Assignment I

- Question 3
  - Pressure gauge B is to measure the pressure at point A in a water flow. If the pressure at B reads 60 kPa, estimate the pressure at point A in kPa. Assume all fluids are at 20°C. See figure below.

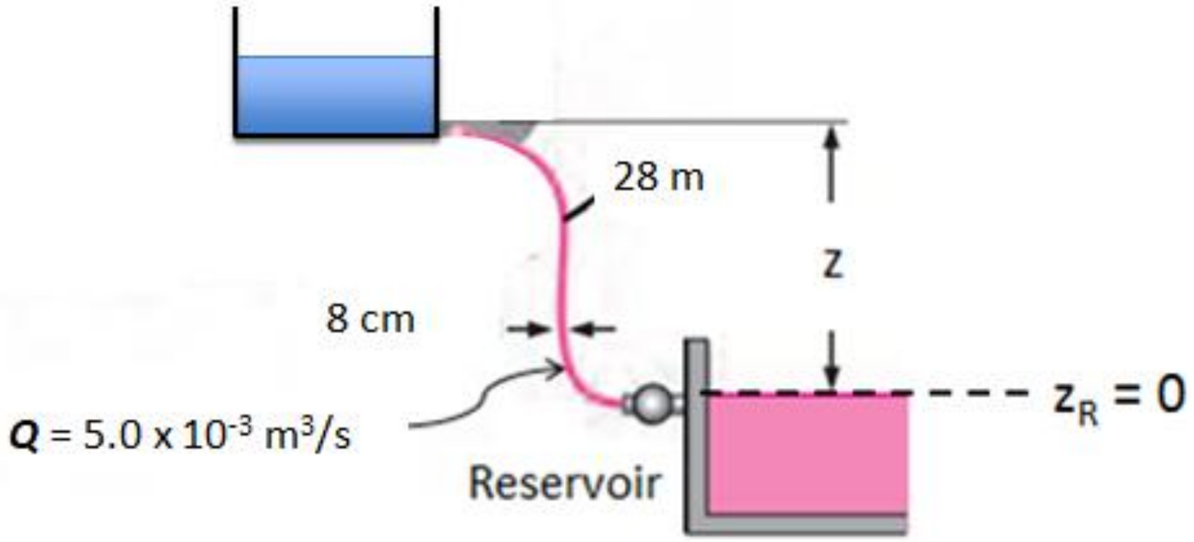


Assignment I

- Question 4
  - Water is flowing through a venturi meter whose diameter is 8 cm at the entrance part and 3 cm at the throat. The pressures measured at the entrance and the throat are 320 kPa and 120 kPa respectively. Determine the flow rate of water.
  - Clue : neglect the frictional factor.

Assignment I

- Question 5
  - Figure shows a piping system that involves a 28 m length and 8 cm diameter pipe. Water flows from the tanker into the reservoir at a rate of 5.0 x 10^{-3} m^3/s. Both tanker and reservoir are exposed to the atmosphere as illustrated in the figure. Given the properties of piping system are as follows:
    - Well-rounded entrance, $K_L = 0.0^3$
    - Sharp-edged exit, $K_L = 1.0$
    - Density of water ρ, = 1000 kg/m^3
    - Dynamic viscosity of water, μ = 0.001 kg/ms
    - Roughness of cast iron pipe, ε = 0.00026 m.
  - Compute the free surface elevation of the source above the reservoir (z). Take the free surface of the reservoir as reference level (z_R).


28 m
z
8 cm
$z_R = 0$
Q = 5.0 x 10-3 m3/s
Reservoir