

Name:

ID #:

Quiz No. 1

Total marks: 10

Time allowed: 30 minutes

Attempt all the questions.

1. The velocity profile in a laminar pipe flow is a parabolic curve whereas in case of turbulent flow it is rather flatter at the center of the pipe. What is the reason for this difference? [1]

2. What is a *hydraulically smooth* pipe? [1]

Answer:

3. Using momentum equation, prove that the head loss at discharge into a reservoir is equal to the velocity head in the pipe. [2]

Answer:

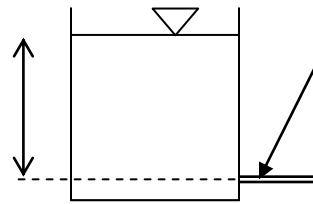
4. Find out the velocity at the outlet (point B) from the tank shown below neglecting all the losses. [2]

Answer:

D= 20mm

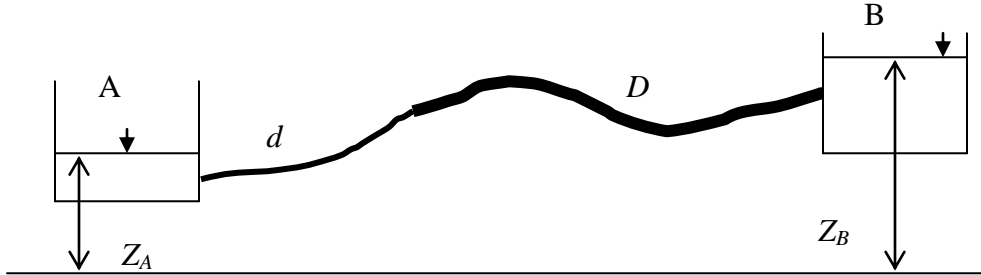
H=19.62m

B



5. Draw the hydraulic grade line and energy grade line for the following pipeline. The smaller and larger pipe diameters are given as d and D , respectively.

[1]



6. Write down the physical meaning of all the terms (not the variables) in the

Reynolds transport theorem, given as
$$\underbrace{\frac{dB_s}{dt}}_I = \underbrace{\frac{d}{dt} \int_{cv} b \rho dV}_{II} + \underbrace{\int_{cs} b \rho \vec{V} \cdot d\vec{A}}_{III} \quad [1]$$

Answer:

I:

II:

III:

7. In what type of flow, Manning's formula is applicable. [1]

Answer:

8. In Darcy-Weisbach equation, friction factor f is a function of

(a)

(b)

[1]