

Unit 9 - Week 8 : INCOMPRESSIBLE VISCOUS FLOW IN PIPES

Course outline

[How to access the portal](#)
[Week 1 : INTRODUCTION](#)
[Week 2 : FLUID STATICS](#)
[Week 3 : FLUID DYNAMICS](#)
[Week 4 : FLUID DYNAMICS](#)
[Week 5 : APPLICATIONS OF FLUID STATICS AND DYNAMICS](#)
[Week 6 : FLUID KINEMATICS](#)
[Week 7 : DIMENSIONAL ANALYSIS](#)
Week 8 : INCOMPRESSIBLE VISCOUS FLOW IN PIPES
 Laminar and Turbulent Flows

 Losses in Pipe Fittings

 Flow in Noncircular Conduits and Multiple Path Pipe Flow

 Quiz : Assignment 8

 Feedback form

[Live Session](#)

Assignment 8

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-10-23, 23:59 IST.

1) The friction factor of laminar liquid flow in a circular pipe is proportional to 1 point

- a. Reynolds number
 b. Inversely to the Reynolds number
 c. Square of the Reynolds number
 d. Square root of the Reynolds number

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. Inversely to the Reynolds number

2) In Hagen-Poiseuille flow of viscous liquid, one of the following pairs of forces strike a balance 1 point

- a. Inertial and viscous forces
 b. Pressure and viscous forces
 c. Gravity and viscous forces
 d. Inertial and gravity forces

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. Pressure and viscous forces

3) Flow in a pipe can be expected to be turbulent when the Reynolds number based on mean velocity an pipe diameter is 1 point

- a. =0
 b. <2000
 c. >3000
 d. >100

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. >3000

4) The stresses that arise due to fluctuations in the velocity components in a turbulent flow are 1 point

- a. Euler stresses
 b. Limit stresses
 c. Reynolds stress
 d. Principal stress

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. Reynolds stress

5) The friction factor for a turbulent flow in smooth pipes varies 1 point

- a. Inversely as Reynolds number
 b. Directly as Reynolds number
 c. As square of Reynolds number
 d. Inversely as $1/4^{\text{th}}$ power of Reynolds number

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. Inversely as $1/4^{\text{th}}$ power of Reynolds number

6) Eddy viscosity means that it is 1 point

- a. A physical property of the fluid
 b. Same as kinematic viscosity
 c. Always associated with laminar flow
 d. An apparent viscosity due to turbulent nature of flow

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. An apparent viscosity due to turbulent nature of flow

7) Which of the following represent the major energy loss 1 point

- a. Bend in pipe
 b. Pipe fitting
 c. Sudden expansion
 d. Friction loss

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. Friction loss

8) Hydraulic gradient line is the sum of pressure head, datum head and kinetic head of a flowing fluid in a pine. This statement is 1 point

- a. True
 b. False
 c. Cannot say

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. False

9) Which of the following represent loss of head at exit of the pipe 1 point

- a. $0.5 (V^2/2g)$
 b. $V^2/2g$
 c. $0.375 (V^2/2g)$
 d. Cannot say

No, the answer is incorrect.
Score: 0

Accepted Answers:
b. $V^2/2g$

10) For steady incompressible flow through a closed conduit of uniform cross-section the direction of flow will always be 1 point

- a. From higher to lower elevation
 b. From higher to lower pressure
 c. From higher to lower velocity
 d. From higher to lower piezometric head

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. From higher to lower piezometric head

11) Find the Darcy head loss due to friction in a pipe of diameter 300 mm and length 50 m, through which water is flowing at a velocity of 3 m/s. Take value of friction factor as 0.01024. 2 points

- a. 0.7828 m
 b. 0.1025 m
 c. 0.1959 m
 d. 1.25 m

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 0.7828 m

12) A 2 km long pipe of 0.2 m diameter connects two reservoirs. The difference between the water levels in reservoirs is 8 m. The Darcy-Weisbach friction factor of the pipe is 0.04, Accounting for friction, entry and exit losses, the velocity in the pipe is 2 points

- a. 0.63 m/s
 b. 0.35 m/s
 c. 2.52 m/s
 d. 1.25 m/s

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 0.63 m/s

13) Water ($\gamma_w = 9.879 \text{ kN/m}^3$) flows with a flow rate of $0.3 \text{ m}^3/\text{s}$ through a pipe AB of 10 m length and of uniform cross-section. The end B is above end A and the pipe makes an angle of 30° to the horizontal. For a pressure of 12 kN/m^2 at the end B, the corresponding pressure at the end A is in kN/m^2 2 points

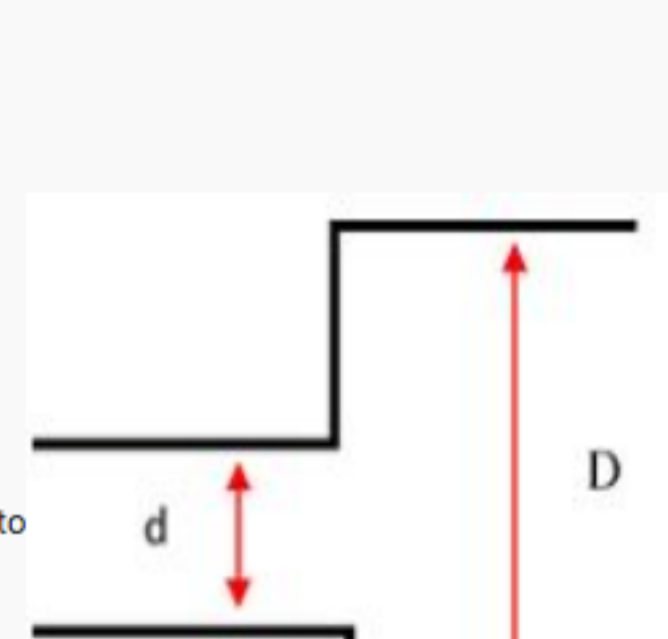
- a. 12
 b. 17
 c. 56.4
 d. 61.4

No, the answer is incorrect.
Score: 0

Accepted Answers:
d. 61.4

14) 2 points

The head loss coefficient in a sudden expansion shown in figure below is proportional to



- a. d^2/D^2
 b. $1-d^2/D^2$
 c. $(1-d^2/D^2)^2$
 d. d^4/D^4

No, the answer is incorrect.
Score: 0

Accepted Answers:
c. $(1-d^2/D^2)^2$

15) The rate of flow of water through a horizontal pipe is $0.25 \text{ m}^3/\text{s}$. The diameter of the pipe which is 200 mm is suddenly enlarged to 400 mm. Determine loss of head due to sudden enlargement 2 points

- a. 1.816 m
 b. 2.816 m
 c. 3.816 m
 d. 4.816 m

No, the answer is incorrect.
Score: 0

Accepted Answers:
a. 1.816 m