Question 1

- The starting point for solving fluid flow problems with constant ρ and μ is :

a. Stoke's equation

b. Euler Equation

c. Navier-Stoke's Equation

d. Hagen-Poiusellie Equation

e. None of these

Question 2

- Steady state is a :

  a. *strictly Eulerian concept*
  b. *strictly Lagrangian concept*
  c. *Both*
  d. *Depends on assumption*
  e. None of these

Question 3

- The correct relationship between Eulerian and Lagrangian frame of reference is :

a. Eulerian = Lagrangian + Acceleration

b. Lagrangian rate of change = Eulerian rate of change + Convective rate of change

c. If Eulerian shows steady state, Lagrangian must show steady state too.

d. Lagrangian measurements are generally converted to Eulerian

e. Eulerian and Lagrangian vector representation produces same visualization for fluid.

Question 4

- Which of the following equation is used for Capillary Viscometer ?

a. Stoke’s equation

b. Euler Equation

c. Navier-Stoke’s Equation

d. Hagen-Poiusellie Equation

e. None of these

Question 5

- The main difference between “analytical fluid dynamics” and “computational fluid dynamics” is :

a. *Problem set up*
b. Addressing different problems all together.
c. Assumptions and solution method(s)
d. Frame of reference
e. Practical Applications

Question 6

- Assume the co-ordinate system to begin in center, i.e x = 0 at the center of W. The expression for average velocity in the given scenario is :

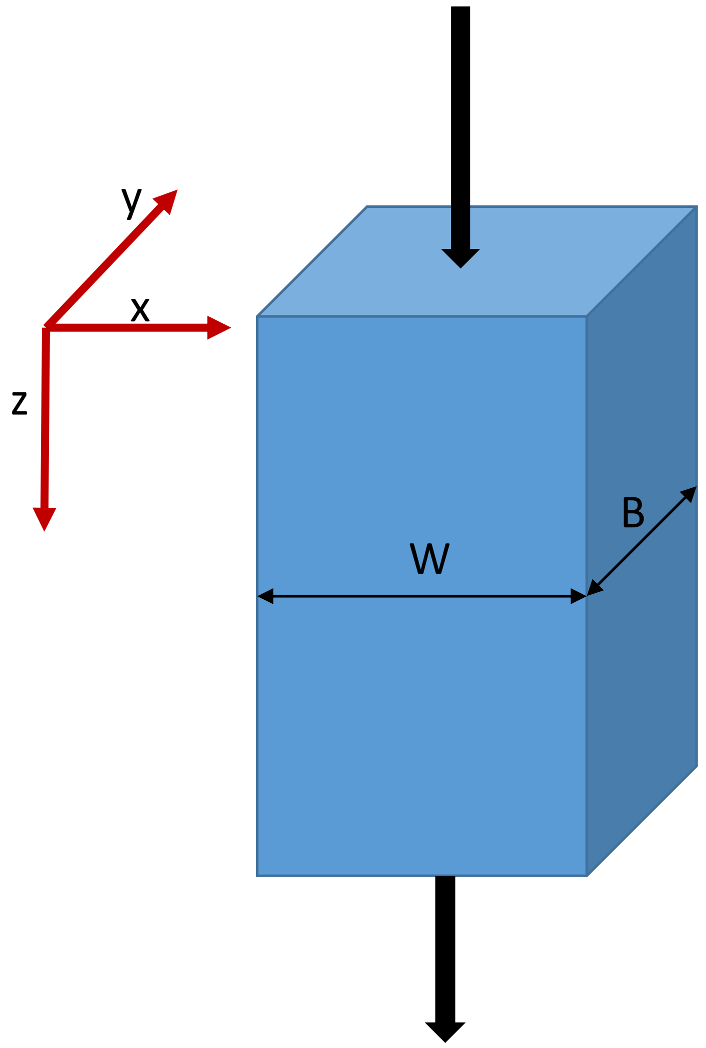
a. $\langle v_z \rangle = \dfrac{\int_{-W/2}^{W/2} \int_{-B/2}^{B/2} v_z \; dx\, dy}{\int_{-W/2}^{W/2} \int_{-B/2}^{B/2} dx\, dy}$

b. $\langle v_z \rangle = \dfrac{\int_{-W}^{W} \int_{-B}^{B} v_z \; dx\, dy}{\int_{-W}^{W} \int_{-B}^{B} dx\, dy}$

c. $\langle v_z \rangle = \dfrac{\int_{0}^{W/2} \int_{0}^{B/2} v_z \; dx\, dy}{\int_{0}^{W/2} \int_{0}^{B/2} dx\, dy}$

d. $\langle v_z \rangle = \dfrac{\int_{0}^{W} \int_{0}^{B} v_z \; dx\, dy}{\int_{0}^{W} \int_{0}^{B} dx\, dy}$

e. None of these



Question 7

- For an incompressible fluid, the equation of continuity reduces to :

a. $\nabla . v = 0$
b. $\mu\nabla^2 v = 0$
c. Trivial solution
d. $-\nabla P + \mu\nabla^2 v = 0$
e. None of the above.

Question 8

- ❑ Equation of a motion is a equation that relates :

a. Resistance forces to flow of fluid

b. Acceleration of fluid property to forces applied

c. Velocity of fluid to forces

d. Rate of change of momentum to convective transport, molecular transport and external body forces

e. None of the above.

Question 9

- The principle of operation of Couette Viscometer is:

a. Transfer of momentum from outer cylinder to inner cylinder to generate torque being measured.
b. Formation of thin film of fluid in steady state.
c. Rotational motion converted to translational motion through fluid
d. Torque forces being balanced by external applied force
e. None of the above.

Question 10

- A flow is incompressible and three-dimensional. The components in the x and y direction are $u = 3x$, $v = 3y$. Which of the following is the correct expression for z direction velocity component denoted by w:

a. $w = 7z$
b. $w = 3z$
c. $w = 21z$
d. $w = -\cancel{10z}$ (-6z)
e. $w = -3z$