1. Which equation describes the dynamics of flow along a streamline?

a) Bernoulli’s equation
b) Reynolds equation
c) Euler’s equation of motion
d) Poiseuille’s equation

Answer: c) Euler’s equation of motion

Explanation: Euler’s equation of motion governs the dynamics of fluid flow along a streamline, considering the balance of forces acting on an infinitesimal fluid element.

---

2. What is the derivation of Bernoulli’s equation based on?

a) Conservation of mass
b) Conservation of energy
c) Conservation of linear momentum
d) Conservation of angular momentum

Answer: b) Conservation of energy

Explanation: Bernoulli’s equation is derived from Euler’s equation of motion by considering the conservation of energy along a streamline.

---

3. Which factor corrects the energy losses in real fluid flow when applying Bernoulli’s equation?

a) Friction factor
b) Reynolds number
c) Mach number
d) Energy correction factor

Answer: d) Energy correction factor

Explanation: The energy correction factor accounts for energy losses due to factors like friction, turbulence, and viscosity in real fluid flow, which are not considered in idealized Bernoulli’s equation.

---

4. Which equation describes the conservation of linear momentum for steady flow?

a) Navier-Stokes equation
b) Bernoulli’s equation
c) Euler’s equation of motion
d) Linear momentum equation

Answer: d) Linear momentum equation

Explanation: The linear momentum equation for steady flow describes the conservation of linear momentum along a streamline, considering the forces acting on the fluid element.

---

5. What is the momentum correction factor used for in fluid dynamics?

a) Correcting for losses in kinetic energy
b) Correcting for losses in linear momentum
c) Correcting for losses in angular momentum
d) Correcting for losses in potential energy

Answer: b) Correcting for losses in linear momentum

Explanation: The momentum correction factor is used to adjust for losses in linear momentum due to factors like viscosity and turbulence in real fluid flow.

---

6. Which equation describes the moment of momentum for fluid flow?

a) Torricelli’s equation
b) Euler’s equation of motion
c) Navier-Stokes equation
d) Moment of momentum equation

Answer: d) Moment of momentum equation

Explanation: The moment of momentum equation describes the conservation of angular momentum for fluid flow, which is useful for analyzing the rotation of fluid elements.

---

7. What type of flow requires the application of the moment of momentum equation?

a) Steady flow
b) Turbulent flow
c) Laminar flow
d) Compressible flow

Answer: a) Steady flow

Explanation: The moment of momentum equation is typically applied to analyze steady flow situations where the fluid motion is consistent over time.

---

8. Which device is used for measuring fluid velocity based on pressure differences?

a) Pitot tube
b) Prandtl tube
c) Venturi meter

d) Orifice meter

Answer: a) Pitot tube

Explanation: A Pitot tube measures fluid velocity by comparing stagnation pressure (total pressure) and static pressure.

---

9. What type of flow measurement device utilizes the principle of fluid acceleration and deceleration?

a) Orifice meter
b) Nozzle meter
c) Pitot tube
d) Venturi meter

Answer: d) Venturi meter

Explanation: A Venturi meter measures fluid flow rate based on the pressure difference created by fluid acceleration and deceleration in a constricted flow passage.

---

10. How does a Prandtl tube measure fluid velocity?

a) By comparing total pressure and static pressure
b) By measuring the flow’s rate of acceleration
c) By measuring the flow’s rate of deceleration
d) By measuring the flow’s temperature

Answer: a) By comparing total pressure and static pressure

Explanation: Similar to a Pitot tube, a Prandtl tube measures fluid velocity by comparing stagnation pressure (total pressure) and static pressure.

---

11. Which flow measurement device relies on the principle of fluid passing through a small hole?

a) Nozzle meter
b) Venturi meter
c) Orifice meter
d) Mouthpiece

Answer: c) Orifice meter

Explanation: An orifice meter measures fluid flow rate by determining the pressure difference across a small hole or orifice.

---

12. What is the primary function of a current meter in fluid dynamics?

a) Measure fluid pressure
b) Measure fluid velocity
c) Measure fluid temperature
d) Measure fluid density

Answer: b) Measure fluid velocity

Explanation: Current meters are used to directly measure fluid velocity in various water bodies, such as rivers, streams, and oceans.

---

13. Which type of flow measurement device is commonly used in open-channel flow, such as rivers and canals?

a) Nozzle meter
b) Weir
c) Pitot tube
d) Orifice meter

Answer: b) Weir

Explanation: Weirs are commonly used in open-channel flow to measure the rate of flow over a rectangular or V-shaped notch.

---

14. How does a nozzle meter measure fluid flow rate?

a) By creating a pressure drop across a nozzle
b) By measuring fluid temperature changes
c) By measuring fluid density changes
d) By measuring fluid viscosity

Answer: a) By creating a pressure drop across a nozzle

Explanation: A nozzle meter measures fluid flow rate by creating a pressure drop across a nozzle, which is related to the flow rate.

---

15. Which principle is utilized by a mouthpiece for flow measurement?

a) Bernoulli’s principle
b) Archimedes’ principle
c) Pascal’s principle
d) Newton’s second law

Answer: a) Bernoulli’s principle

Explanation: A mouthpiece utilizes Bernoulli’s principle to measure fluid flow rate by considering the pressure difference between the throat and the entrance of the mouthpiece.

---

16. What is the purpose of a Pitot-static tube in fluid dynamics?

a) Measure fluid density
b) Measure fluid temperature
c) Measure fluid velocity
d) Measure fluid pressure

Answer: c) Measure fluid velocity

Explanation: A Pitot-static tube is designed to measure fluid velocity by comparing stagnation pressure (total pressure) and static pressure.

---

17. Which type of flow measurement device is commonly used for precise control of fluid flow in pipelines?

a) Nozzle meter
b) Venturi meter

c) Orifice meter
d) Prandtl tube

Answer: c) Orifice meter

Explanation: Orifice meters are commonly used in pipelines for precise control of fluid flow rates and are relatively simple and cost-effective.

---

18. What does a current meter primarily measure in fluid dynamics?

a) Fluid density
b) Fluid pressure
c) Fluid velocity
d) Fluid viscosity

Answer: c) Fluid velocity

Explanation: Current meters are specifically designed to measure fluid velocity in various water bodies.

---

19. In fluid dynamics, what is the purpose of a Pitot tube?

a) Measure fluid density
b) Measure fluid velocity
c) Measure fluid temperature
d)Measure fluid pressure

Answer: b) Measure fluid velocity

Explanation: A Pitot tube is primarily used to measure fluid velocity by comparing stagnation pressure (total pressure) and static pressure.

---

20. Which principle is utilized by a Venturi meter for flow measurement?

a) Archimedes' principle
b) Pascal's principle
c) Bernoulli's principle
d) Newton's second law

Answer: c) Bernoulli's principle

Explanation: A Venturi meter utilizes Bernoulli's principle to measure fluid flow rate by creating a pressure difference across a constricted flow passage.