

Nom et Prénom :

Exercise 1: (10 points) : Answer T or F

1. The volumetric water flow rate passing through a stretch of channel is expressed in kg/s.
2. In channels, smoother surfaces have lower Manning roughness coefficients.
3. A triangle is a shape with fewer sides than a square.
4. The Reynolds number is a dimensional quantity.
5. The past continuous tense describes actions that started in the past and are still going on.
6. Wastewater is collected through underground channels and transported to treatment plants.
7. The hydraulic jump is defined as the transition from torrential flow to fluvial flow.
8. In closed conduits the flow is laminar if the Reynolds number is above 2,000.
9. Pumps add energy to the fluid of a piping system.
10. In uniform flow, the flow depth and velocity change along the channel.

Exercise 2: (20 points) : Answer A or B

1. Which structure is used to store water? A) Dike B) Reservoir
2. Which flow type describes fluid motion at low velocities? A) Turbulent flow B) Laminar flow
3. What is the primary factor driving flow in pipes? A) Pressure difference B) Gravity
4. What is the role of a pronoun in a sentence? A) To modify a verb B) To replace a noun
5. Which tense describes actions happening right now? A) Present Continuous B) Present Perfect
6. Laminar flow is characterized by? A) highly ordered motion B) highly disordered motion
7. What's the biggest stormwater challenge in cities? A) Flooding B) Impermeable surfaces
8. What is the cause of water hammer? A) Sudden changes in velocity B) Slow drainage of water
9. What describes flow depth that does not change over time? A) Steady flow B) Unsteady flow
10. What shape is commonly used for the cross-section of a standard pipe? A) Square B) Circular
11. Hydraulic jump will never occur when? A) Froude number < 1 B) Froude number > 1
12. What is the governing force in open channel flow? A) Gravitational force B) Frictional force
13. What is the Manning equation used to calculate? A) Flow velocity B) Water pressure
14. Where does a hydraulic jump occur? A) Upstream of a dam B) Downstream of a spillway
15. Which material is commonly used for underground pipes? A) Rubber B) Concrete
16. What does the Manning equation require as an input? A) Pipe radius B) Channel slope
17. Which type of noun names a specific person, place, or thing? A) Proper nouns B) Common nouns
18. What is a hydraulic jump? A) Flow velocity increase B) Supercritical to subcritical flow
19. What is used to diminish water hammer effects? A) Pressure release valves B) Smaller pipes
20. Which tense is used for habitual actions? A) Present Perfect B) Present Simple

Exercise 3: (20 points) : Answer A or B or C

1. Which of these is an example of a countable noun?
A) Water B) Pipe C) Pressure
2. What does the Future Simple tense express? A) Actions completed in the past
B) Actions that will be happening C) Actions happening right now
3. The area is expressed in?
A) m³ B) m C) m²
4. What is the main function of a dam in hydraulics?
A) To decrease water velocity B) To regulate flow and storage C) To prevent soil erosion
5. Which of these hydraulic structures protect against floods?
A) Dikes B) Dams C) Reservoirs
6. Which parameter does not affect flow in open channels?
A) Surface roughness B) Water temperature C) Channel slope
7. What does "subcritical flow" mean in open channels? A) Low velocity and high depth
B) High velocity and low depth C) Low velocity and low depth
8. Which unit is used for the Manning roughness coefficient? A) Seconds per meter
B) No unit C) Seconds per meter to the power of one-third
9. In a pipe with constant diameter, what happens to velocity when pressure increases?
A) Velocity decreases B) Velocity increases C) Velocity stays the same
10. During a hydraulic jump, what happens to mechanical energy?
A) Energy is gained B) Energy is constant C) Energy is lost
11. What happens to the flow velocity if the channel slope increases in the Manning equation?
A) Velocity decreases B) Velocity increases C) Velocity remains constant
12. The hydraulic radius in the Manning equation is: A) Wetted perimeter divided by cross-section
B) Cross-section divided by wetted perimeter C) Channel slope times wetted perimeter
13. What type of flow can take place when the Reynolds number equals 3000?
A) Laminar flow B) Turbulent flow C) Transitional flow
14. What is the primary method to increase flow velocity in a pipe system?
A) Reduce pipe diameter B) Increase pipe slope C) Increase pipe diameter
15. Which physical quantity changes abruptly during a water hammer event?
A) Flow height B) Flow temperature C) Flow velocity
16. What is the primary function of a turbine in a fluid system? A) To remove energy from the fluid
B) To add energy to the fluid. C) To maintain the energy of the fluid.
17. What can cause a water hammer to be more severe?
A) Shorter pipe lengths B) Faster valve closures C) Larger water tanks
18. What type of flow occurs upstream of a hydraulic jump?
A) Subcritical flow B) Supercritical flow C) Uniform flow
19. What is the Froude number at the critical depth?
A) Greater than 1 B) Less than 1 C) Equal to 1
20. What is the primary benefit of a hydraulic jump in energy dissipation? A) Reduces sediment deposition
B) Converts kinetic energy into heat and turbulence C) Increases flow velocity

Good Luck

Réponses: Exercice 1: (10 points) : Answer T or F

Answers:

- | | | | |
|----|---|-----|---|
| 1. | F | 6. | F |
| 2. | T | 7. | T |
| 3. | T | 8. | F |
| 4. | F | 9. | T |
| 5. | F | 10. | F |

Réponses: Exercice 2: (20 points) : Answer A or B

Answers:

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|-----|---|-----|---|
| 1. | B | 11. | A |
| 2. | B | 12. | A |
| 3. | A | 13. | A |
| 4. | B | 14. | B |
| 5. | A | 15. | B |
| 6. | A | 16. | B |
| 7. | B | 17. | A |
| 8. | A | 18. | B |
| 9. | A | 19. | A |
| 10. | B | 20. | B |

Réponses: Exercice 3: (20 points) : Answer A or B or C

Answers:

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|-----|---|-----|---|
| 1. | B | 11. | B |
| 2. | B | 12. | B |
| 3. | C | 13. | C |
| 4. | B | 14. | A |
| 5. | A | 15. | C |
| 6. | B | 16. | A |
| 7. | A | 17. | B |
| 8. | B | 18. | B |
| 9. | A | 19. | C |
| 10. | C | 20. | B |