



# Certification Boulevard

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## Test Your Knowledge of Water Supply Topics

- Given the following data, calculate the approximate horsepower delivered by this pump:
  - Flow is 375 gpm.
  - TDH is 75 feet.
  - Does not consider pump and motor efficiency.

a. 20 HP	b. 7 HP
c. 17 HP	d. 0.8 HP
- Which repair kit is designed for use with 150-pound cylinders?
 

a. "A" kit	b. "B" kit
c. "C" kit	d. "D" kit
- If the velocity of a stream of water is 75 cubic feet per minute, what is the volume of the stream in mgd?
 

a. 0.5 mgd	b. 2.0 mgd
c. 0.808 mgd	d. 1.0 mgd
- Which has a lower pH, sodium hydroxide or aluminum sulfate?
 

a. Aluminum sulfate.
b. Sodium hydroxide.
c. They are both the same.
- What will the pressure gauge read on the suction of a pump if the pump is located at floor elevation of the tank and the tank has 24 feet of static water level?
 

a. About 55 psi	b. About 8.5 psi
c. About 13 psi	d. About 10 psi
- If the discharge head on an electrically driven centrifugal pump decreases, what happens to the motor current?
 

a. It remains the same.	b. It goes up.
c. It goes down.	d. It will oscillate.
- Water with low alkalinity must have:
 

a. High pH.	b. Low pH.
c. Neutral pH.	d. None of the above.
- The vapor density of a hazardous gas present in a confined space is 1.15. Where is this gas likely to be found?
 

a. Near the floor.
b. Equally distributed throughout the space.
c. Near the ceiling.
d. At this density, the gas will dissipate immediately.
- A rectangular flume is 10 inches by 10 inches. The water is eight inches deep and moving at a velocity of two feet per second.

How many gallons of water will the flume deliver in four hours?

- |                 |                 |
|-----------------|-----------------|
| a. 62,330 gals  | b. 87,160 gals  |
| c. 119,693 gals | d. 247,310 gals |

10. Which of these 3/4" meters on a test bench is recommended to be tested with the positive displacement meters?

- |                   |                     |
|-------------------|---------------------|
| a. Turbine meters | b. Multi-jet meters |
| c. Piston meters  | d. Compound meters  |

ANSWERS ON PAGE XX

### Send Us Your Questions For Certification Boulevard

Do you have a question or an exercise you would like to feature in "Certification Boulevard?" We'll be glad to publish it. Just send your question (with the answer) or your exercise (with the solution) to:

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There is no limit to the number of questions or exercises you may submit. Please include your name, city, and organization or company so we can give you credit.

# Certification Boulevard Answer Key

From page 47

1. **b. 7 HP**

*Horsepower*

$$\begin{aligned} &= (\text{gpm} \times \text{TDH, feet} \times 8.34 \text{ lbs/gal}) \div 33,000 \text{ foot lbs} \\ &\quad \text{per second} \\ &= 375 \text{ gpm} \times 75 \text{ TDH} \times 8.34 \text{ lbs per gal} \div 33,000 \\ &= 7.1 \text{ HP} \end{aligned}$$

2. **a. "A" kit**

*The "A" kit is for 150-pound cylinders ... the "B" kit is for one-ton containers ... and the "C" kit is for tank cars and trucks. There is no "D" kit.*

3. **c. 0.808 mgd**

$$75 \text{ cfm} \times 7.48 \text{ gal per cu.ft.} \times 1440 \text{ mins per day} = 807,840 \text{ gpd}$$

4. **a. Aluminum sulfate**

*Aluminum sulfate (Alum) is an acid with a pH typically below 4.0. Sodium hydroxide (Caustic) is an alkaline with a pH typically greater than 12.*

5. **d. About 10 psi.**

*Each foot of water generates 0.433 psi (1 foot divided by 2.31 ft per psi)*

$$24 \text{ feet of water} \times 0.433 \text{ psi} = 10.392 \text{ psi}$$

OR

$$24 \text{ feet of water} \div 2.31 \text{ ft per psi} = 10.389 \text{ psi}$$

6. **b. It goes up.**

*You may think that if the discharge pressure decreases, the motor does less work; therefore, the current should go down. However, reducing the discharge pressure on a centrifugal pump increases the discharge flow, so the pump actually does more work and the motor current goes up.*

7. **d. None of the above.**

*There is not necessarily a correlation between alkalinity (high or low) and pH.*

8. **a. Near the floor.**

*A gas with a vapor density (specific gravity) greater than 1.0 will be more likely to settle to the bottom of the space.*

9. **c. 119,693 gals**

*Gallons*

$$= \text{Length, ft} \times \text{Width, ft} \times \text{Depth, ft} \times 7.48 \text{ gals per cu ft}$$

$$= 10 \text{ inches} \div 12 \text{ inches per foot} = 0.833 \text{ feet}$$

$$= 8 \text{ inches} \div 12 \text{ inches per foot} = 0.667 \text{ feet}$$

$$= 0.833 \text{ ft} \times 0.833 \text{ ft} \times 0.667 \text{ ft} \times 7.48 \text{ gals per cu ft}$$

$$= 3.462 \text{ gallons}$$

$$= 2 \text{ fps} \div 0.833 \text{ ft} = 2.401 \text{ secs}$$

$$= 2.401 \text{ secs} \times 3.462 \text{ gals}$$

$$= 8.312 \text{ gals per sec}$$

$$= 8.312 \text{ gals per sec} \times 60 \text{ secs per min}$$

$$= 498.72 \text{ gpm}$$

$$= 4 \text{ hours} \times 60 \text{ mins per hr} = 240 \text{ mins in 4 hrs}$$

$$= 498.72 \text{ gpm} \times 240 \text{ mins} = 119,693 \text{ gals in 4 hrs}$$

10. **c. Piston meters**

*Piston and positive displacement meters measure the same amount going through the meter. Turbine and compound meters start at about two inches and larger. Multi-jet meters measure about the same as a turbine meter.*