



Certification Boulevard

Test Your Knowledge of Water Supply and Wastewater Disposal Answer Key

1. Given the following data, calculate the approximate horsepower delivered by this pump:

- Flow is 1,500 gpm
- TDH is 125 feet
- Does not consider pump and motor efficiency

- a. 20 HP
- b. **47 HP**
- c. 175 HP
- d. 55 HP

$$\begin{aligned} \text{Horsepower} &= (\text{gpm} \times \text{TDH, feet} \times 8.34 \text{ lbs/gal}) \div 33,000 \text{ foot lbs/second} \\ 1,500 \text{ gpm} \times 125 \text{ TDH} \times 8.34 \text{ lbs/gal} &\div 33,000 \\ &= 47.4 \text{ HP} \end{aligned}$$

2. If a gallon of water weighs 8.34 lbs, and a cubic foot of water holds 7.48 gallons ... how much does a cubic foot of water weigh?

- a. 92.4 lbs
- b. 89.6 lbs
- c. **62.4 lbs**
- d. 3.14 lbs

$$8.34 \text{ lbs/gal} \times 7.48 \text{ gal/ft}^3 = 62.4 \text{ lbs/ft}^3$$

3. What test is typically performed to identify toxicity on wastewater effluent discharged to open bodies of water in Florida?

- a. CBOD₅
- b. TSS
- c. pH
- d. **Bioassay**

4. What are typical fecal coliform standards for wastewater effluent applied as reuse water in Florida?

- a. No Greater Than 200 #/100 ml
- b. 50% of the Samples Less Than 2 #/100 ml
- c. **75% of the Samples Non-Detectable /100ml**
- d. **No Single Sample Greater Than 25 #/100 ml**

5. What are the principle nutrients that must be removed from effluent before it is safe for discharge to Florida waters?
- Sulfate and Carbon
 - Nitrogen and Carbon
 - Phosphorus and Sulfate
 - Nitrogen and Phosphorus**
6. Given the following data, how many gallons per year of sodium hypochlorite are used to disinfect effluent at this plant?
- Chlorine application rate required is 450 lbs/day
 - Sodium Hypochlorite solution strength is 10.5%
 - Bulk density of solution is 9.8 lbs/gal

- 159,621 gal/year**
- 57,772 gal/year
- 169,013 gal/year
- 81,939 gal/year

Lbs/day of solution = lbs/day chlorine used ÷ solution strength

Gals/day solution = lbs/day solution ÷ density of solution

450 lbs/day chlorine applied ÷ 0.105 = 4,285.7 = lbs/day solution

4,285.7 lbs/day solution ÷ 9.8 lbs/gal = 437.3 gpd x 365 days/year = 159,621 gal/year

7. When pumping water from a well to a treatment process, the Total Dynamic Head is the sum of four (4) components, list these components:

- Friction Head**
- Suction Head**
- Static Head**
- Velocity Head**

8. A potable water flow meter reads 83 gpm for 13 hrs/day and 47 gpm for the remaining 11 hrs/day. What is the total daily flow in mgd?

- 0.64740 mgd
- 0.09576 mgd**
- 0.03102 mgd
- 0.1870 mgd

(83 gpm x 13hrs/day x 60 mins/hr) + (47 gpm x 11 hrs/day x 60 mins/day)

64,740 gpd + 31,020 gpd = 95,760 gpd ÷ 1,000,000

= 0.09576 mgd

9. What is the flow velocity in a 6-inch pipe as compared to the flow velocity in a 12-inch pipe, assuming both pipes are carrying a water flow of 50 gpm.
- a. The same
 - b. Twice the velocity
 - c. Three time the velocity
 - d. **Four time the velocity**

$$\begin{aligned} \text{Cross section of a 6-inch pipe} &= \pi r^2 \\ 3.14 \times (3 \text{ in.} \div 12 \text{ in.})^2 &= 0.196 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \text{Cross section of a 12-inch pipe} &= \pi r^2 \\ 3.14 \times (6 \text{ in.} \div 12 \text{ in.})^2 &= 0.785 \text{ ft}^2 \end{aligned}$$

$$0.785 \text{ ft}^2 \div 0.196 \text{ ft}^2 = 4.0$$

10. Which DEP rule governs water reuse in Florida?
- a. 62-900
 - b. 62-720
 - c. 62-503
 - d. **62-610**