Certification Boulevard

Test Your Knowledge of Water Supply and Other Miscellaneous Topics – Answer Key

1. A potable water flow meter reads 175 gpm for 8.5 hrs/day, 95 gpm for 6.5 hrs/day and 48 gpm for the remainder of the 24-hour day. What is the total daily flow in mgd?

   a. 0.64740 mgd
   b. 0.09576 mgd
   c. 0.1522 mgd
   d. 0.1870 mgd

   (175 gpm x 8.5 hrs/day x 60 mins/hr) + (95 gpm x 6.5 hrs/day x 60 mins/day) + (48 gpm x 9 hrs/day x 60 mins/hr)
   89,250 gpd + 37,050 gpd + 25,920 = 152,220 gpd ÷ 1,000,000 = 0.1522 mgd

2. Given the following data, what is the annual budget for sodium hypochlorite at this package water plant?

   - Finished water flow is 200,000 gpd
   - Chlorine dosage is 20 mg/L
   - Sodium Hypochlorite solution strength is 11.25%
   - Bulk density of solution is 9.7 lbs/gal
   - Cost per bulk liquid gallon is $0.38

   a. $22,655 per year
   b. $4,240 per year
   c. $26,224 per year
   d. $3,396 per year

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

   (0.2 mgd x 20 mg/L x 8.34 lbs/gal) ÷ 0.1125 = 296.5 = lbs/day solution
   296.5 lbs/day solution ÷ 9.7 lbs/gal = 30.57 gpd x 365 days/year = 11,158 gal/year
   11,158 gal/year x $0.38 per gallon = $4,240 per year

3. What is the velocity in cubic feet per minute (cfm) of a 1 mgd stream of water?

   a. 1.55 cfm
   b. 8.34 cfm
   c. 7.48 cfm
   d. 92.84 cfm

   1,000,000 gpd divided by 1,440 mins/day divided by 7.48 gal/cu.ft. = 92.84 cfm/mgd

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

   - Flow is 700 gpm
   - TDH is 85 feet
   - Does not consider pump and motor efficiency

   a. 15 HP
   b. 20 HP
   c. 25 HP
   d. 7.5 HP

   Horsepower = (gpm x TDH, feet x 8.34 lbs/gal) ÷ 33,000 foot lbs/second
   700 gpm x 85 TDH x 8.34 lbs/gal ÷ 33,000
   = 15.04 HP

5. Which repair kit is designed for use with 150-pound chlorine cylinders?

   a. "A" kit
   b. "B" kit
   c. "C" kit
   d. None of the above

6. 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. 92.8 lbs
   b. 56.7 lbs
   c. **62.4 lbs**
   d. 3.14 lbs

   8.34 lbs/gal x 7.48 gal/ft³ = 62.4 lbs/ft³

7. What is the flow velocity in a 12-inch pipe as compared to the flow velocity in a 24-inch pipe, assuming both pipes are carrying the same volume of water flow.

   a. The same
   b. Twice the velocity
   c. Three time the velocity
   d. Four time the velocity

   Cross section of a 12-inch pipe = πr^2
   3.14 x (6 in. ÷ 12 in.)² = 0.785 ft²

   Cross section of a 24-inch pipe = πr^2
   3.14 x (12 in. ÷ 12 in.)² = 3.14 ft²

   3.14 ft² ÷ 0.785 ft² = 4.0

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

   a. **Friction Head**
   b. **Suction Head**
   c. **Static Head**
   d. **Velocity Head**

9. What is the weight relationship of chlorine liquid as compared to water?

   a. Water weighs more than liquid chlorine
   b. Liquid chlorine weighs 2.5 times more than water
   c. Water weighs 1.5 times more than liquid chlorine
   d. Liquid chlorine weighs 1.5 times more than water

10. 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 30 feet of static water level?

    a. About 69 psi
    b. About 9.5 psi
    c. About 13 psi
    d. About 17 psi

    Each foot of water generates 0.433 psi
    30 feet of water x 0.433 psi = 12.99 psi

Please forward your comments and sample questions for publication to:

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