

Operator Quiz Winter 2022 – Test Your Math Skills

The following questions are designed for individuals/trainees pursuing certification as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different process of wastewater treatment. Good luck!

1. If a 120 MGD flow of wastewater is dosed at a rate of 10 mg/l, what should the chlorine-feed setting be to the nearest 100 lb/d?
 - a. 10,000
 - b. 12,000
 - c. 1,200
 - d. 1,000

2. If chlorine costs \$0.23/lb, what is the closest annual cost to chlorinate a 7 MGD flow rate at a chlorine dosage of 3.2 mg/l?
 - a. \$15,700
 - b. \$43
 - c. \$1,570
 - d. \$190

3. The influent suspended solids concentration is 90 mg/l. The effluent suspended solids concentration is 5 mg/l. Calculate the closest treatment efficiency of the plant.
 - a. 64%
 - b. 84%
 - c. 94%
 - d. 74%

4. Given the following data, determine the percent volatile suspended solids of this sample: weight of dish = 21.01 g, weight of dish and wet sample = 23.71 g, weight of dish and dry sample = 21.48 g, weight of dish and ash = 21.11 g
 - a. 21%
 - b. 52%
 - c. 96%
 - d. 79%

5. What is the weir overflow rate for a circular clarifier given the following: diameter = 60 feet and flow = 4 MGD.
 - a. 2,500 gpd/ft
 - b. 21,231 gpd/ft
 - c. 66,667 gpd/ft
 - d. 25,000 gpd/ft

6. Calculate the percentage reduction of BOD through the plant, given the following data: wastewater entering the plant has a BOD of 437 mg/l; plant effluent has a BOD of 42 mg/l.
 - a. 90%
 - b. 10%
 - c. 86%
 - d. 42%

7. The volume of a primary anaerobic digester is 60,000 cubic feet. The raw sludge feed rate is 8,000 lbs dry sludge per day and the volatile solids content is 78%. What is the organic loading rate in lbs VS/cubic foot/day?
 - a. 1.04
 - b. 5.85
 - c. 0.305
 - d. 0.104

8. How many pounds per day of polymer must be added to a flow of 15 MGD if it is required to be treated at a dose of 0.6 mg/L?
 - a. 75.06 lbs
 - b. 0.5 lbs
 - c. 125.1 lbs
 - d. 33.3 lbs

9. Compute the detention time in hours in a final clarifier given the following: diameter = 80 feet and depth = 12 feet and flow rate = 4.0 MGD.
 - a. 3.1 hrs
 - b. 2.7 hrs
 - c. 0.11 hrs
 - d. 4.6 hrs

10. Wastewater flowing at a velocity of 8.0 ft/sec. in a 96-inch diameter pipe. What is the flow rate in gpm?
 - a. 401
 - b. 3,006
 - c. 180,400
 - d. 768

Answers below.



For those who have questions concerning operator certification requirements and scheduling, please contact Carolyn Steinhauer at 315-422-7811 ext. 4, carolyn@nywea.org, or visit www.nywea.org.

Answers: 1. (a) 10,000 2. (a) \$15,700 3. (c) 94%
 4. (d) 79% 5. (b) 21,231 gpd/ft 6. (a) 86% 7. (d) 0.104
 8. (a) 75.06 lbs 9. (b) 2.7 hrs 10. (c) 180,400.