

Math Multiple Choice

1. A water treatment plant produces 3 million gallons per day, and uses chlorine gas, dosed at 7 mg/L, how many pounds per day will the plant use?
 - a. 100 lbs/day
 - b. 175 lbs/day
 - c. 25 lbs/day
 - d. 150 lbs/day
2. A water plant uses sodium hypochlorite (12.5%) to disinfect the water. The target dose is 1.2 mg/L. They treat 0.25 million gallons per day. How many pounds of sodium hypochlorite will need to be fed?
 - a. 2.5 lbs/day
 - b. 5 lbs/day
 - c. 10 lbs/day
 - d. 20 lbs/day
3. A water treatment plant operates at the rate of 75 gallons per minute. They dose soda ash at 14 mg/L. How many pounds of soda ash will they use in a day?
 - a. 12.61 lbs/day
 - b. 660 lbs/day
 - c. 4526 lbs/day
 - d. 8757 lbs/day
4. Your storage tank has been taken out of service for cleaning. The 50,000 gallon tank must be properly disinfected before you can return it to service. The consulting firm recommends you use 25 mg/L of 68% calcium hypochlorite. How many pounds of calcium hypochlorite do you need to add to the water?
 - a. 10.4 lbs/day
 - b. 15.3 lbs/day
 - c. 20.2 lbs/day
 - d. 45.3 lbs/day
5. You must maintain 0.5 mg/L chlorine residual in the finished water with a chlorine demand of 1.5 mg/L. The pumping rate is 300 gpm. How many pounds of 65% calcium hypochlorite will be fed during 12 hours?
 - a. 5.5 lbs
 - b. 7.2 lbs
 - c. 11.1 lbs
 - d. 13.2 lbs
6. How many gallons of 12% sodium hypochlorite are required to treat 150,000 gpd with a desired residual of 0.8 mg/L and a chlorine demand of 0.6 mg/L? NOTE: 12% sodium hypochlorite – 1.2 lb/gallon available chlorine (“active ingredient” weight).
 - a. 1.75 gal
 - b. 1.46 gal
 - c. 3.2 gal
 - d. 5.5 gal

7. If a free chlorine residual of 2.5 mg/L is measured at the end of the clearwell after 4 hours of detention time, what is the CT value in mg-min/L?
 - a. 10
 - b. 200
 - c. 400
 - d. 600
8. In 24 hours, 4.2 gallons of 12% hypochlorite solution is fed. How much (in gallons) would you have to use if the concentration was 7%?
 - a. 2.4 gal
 - b. 5 gal
 - c. 7.2 gal
 - d. 10.1 gal
9. A treatment plant uses 12.5% hypochlorite to disinfect the water. The required hypochlorite dosage is 2 mg/L and the plant flow is 300,000 gpd. How many gallons of 12.5% hypochlorite are required (12.5% hypo has 1.25 lbs/gal available chlorine)?
 - a. 5.1 gal
 - b. 4 gal
 - c. 12 gal
 - d. 400 gal
10. At a flow rate of 375 gpm, how many pounds of 67% calcium hypochlorite would be required to maintain a 0.8 mg/L chlorine residual in the finished water if the chlorine demand is 0.8 mg/L?
 - a. 3.6 lbs
 - b. 5.4 lbs
 - c. 7.2 lbs
 - d. 10.8 lbs
11. How many pounds of dry chemical must be added to a 50 gallons day tank to produce a 0.5% solution?
 - a. 2.1 lbs
 - b. 4.3 lbs
 - c. 6.2 lbs
 - d. 8.3 lbs
12. How many pounds of caustic soda are there in a gallon of caustic soda that is 25% pure that has a specific gravity of 1.28?
 - a. 1.33 lbs
 - b. 2.66 lbs
 - c. 3.99 lbs
 - d. 4.99 lbs
13. How much does a 55-gallon drum of zinc orthophosphate weigh if the MSDS says the specific gravity of zinc orthophosphate is 1.46?
 - a. 11.5 lbs
 - b. 111.8 lbs
 - c. 312 lbs
 - d. 670 lbs

14. An operator wants to estimate the approximate speed and stroke settings on a diaphragm pump that is rated to deliver a maximum pump output of 24 gallons per day. The system needs to deliver approximately 15 gallons per day of sodium hypochlorite. Where would the speed and stroke need to be set?
- 70% and 70%
 - 80% and 70%
 - 90% and 70%
 - Drop kick the pump
15. What is the pressure (in psi) at a point 12 feet below the surface?
- 5.2 psi
 - 27.72 psi
 - 52.2 psi
 - 100.3 psi
16. How many pounds of dry chemical must be added to a 75-gallon tank to produce a 8% solution?
- 10 lbs
 - 25 lbs
 - 50 lbs
 - 75 lbs
17. 60% hydrofluosilicic acid has a specific gravity of 1.46. How much (in pounds) does a 55-gallon drum weigh?
- 12.8 lbs
 - 300 lbs
 - 450 lbs
 - 670 lbs
18. How many feet of water would be in a tank if the pressure gauge at the base of the tank read 15 psi?
- 35 ft
 - 6.5 ft
 - 3.2 ft
 - 70 ft
19. If the plant flow is set at 350,000 gallons and the system uses 12 pounds of anhydrous ferric chloride, what is the dose?
- 4.11 mg/l
 - 50.32 mg/l
 - 151.65 mg/l
 - 286 mg/l
20. A mixed media filter has a length of 50 feet and a width of 456 inches. What is the surface area of the filter?
- 80 sq ft
 - 410 sq ft
 - 1,900 sq ft
 - 22,800 sq ft

Bonus and or just for the gas chlorine and filter people!

21. A water plant uses 25% caustic soda to raise the pH of the water. The target dose is 20 mg/L. They treat 600 gpm. Specific gravity of 25% caustic soda is 1.28 How many gallons of caustic soda will need to be fed?
 - a. 10.67 gals
 - b. 29.3 gals
 - c. 54.1 gals
 - d. Not d, but which other is a good guess?
22. If a 24 GPD pump is set at 80% stroke length and 100% speed, the theoretical pump output would be how many gal/day or ml/min?
 - a. 19.2 gal/day or 50.5 ml/min
 - b. 19.2 gal/day or 25.5 ml/min
 - c. 17.1 gal/day or 50.5 ml/min
 - d. I have no clue nor do I care, it's a bonus and I'm gonna be a dr either way.
23. A chlorinator in a water treatment plant that produces 600,000 gallons per day is set to feed 30 lbs/day. If this feed rate is decreased by 10 lbs/day, the dosage will be reduced by how many mg/L?
 - a. 1 mg/l
 - b. 2 mg/l
 - c. 3 mg/l
 - d. 4 mg/l
24. A filter 35 feet wide by 20 feet long needs a backwash rate of 20 gallons per minute per square foot. Determine the required backwash pumping rate in gpm.
 - a. 1200 gpm
 - b. 1300 gpm
 - c. 1400 gpm
 - d. 1500 gpm
25. What is the filter capacity (in gpm) of a system with a sand bed 40 feet in diameter when the filters are rated to have a capacity of 2.5 gpm/sq ft?
 - a. 78.5 gpm
 - b. 250 gpm
 - c. 1500 gpm
 - d. 3140 gpm
26. A filter 25 feet long and 35 feet wide treats a total of 1400 gpm. What is the filter loading rate?
 - a. 1.6 gpm/sq ft
 - b. 3.2 gpm/sq ft
 - c. 5.2 gpm/sq ft
 - d. 81. gpm/sq ft
27. If a water treatment plant that produces 990,000 decreases its flow to 850,000 gallons per day, the amount of chlorine fed will change from 20 lbs/day to how many pounds per day?
 - a. 5.2 lbs/day
 - b. 10.7 lbs/day
 - c. 13.5 lbs/day
 - d. 17.17 lbs/day

Answers

1. b
2. d
3. a
4. b
5. a
6. b
7. d
8. c
9. b
10. d
11. a
12. b
13. d
14. c
15. a
16. c
17. d
18. a
19. a
20. c
21. c
22. a
23. b
24. c
25. d
26. a
27. d