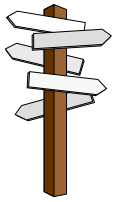
Certification Boulevard



Test Your Knowledge of Advanced Treatment Topics

1. Which chemical(s) can effectively be used to remove phosphorus from wastewater?

    a. Lime
    b. Sodium Hydroxide
    c. Ferric Chloride
    d. Aluminum Sulfate

2. Given the following Ortho P data for inlet and outlet of a BNR fermentation tank, does this appear to be a problem?

    - Fermentation Inlet Ortho P is 6.5 mg/L
    - Fermentation Outlet Ortho P is 15 mg/L

    a. Yes, the Ortho P is too high in the fermentation tank outlet
    b. No, the fermentation outlet Ortho P should be 2 to 3 times the concentration of the inlet
    c. The fermentation tank is designed to release phosphorus as a conditioning process
    d. Both "b & c"

3. Given the following data, what is the solids loading rate on the secondary clarifiers?

    - Plant Influent Flow is 12.5 mgd
    - The RAS Rate is 65% of Q
    - There are Four (4) 120 ft Diameter Secondary Clarifiers
    - The Aeration MLSS is 3,100 mg/L

    a. 11.8 lbs/day/ft^2
    b. 8.6 lbs/day/ft^2
    c. 13.9 lbs/day/ft^2
    d. 7.1 lbs/day/ft^2

4. Given the following data, and using the data provided in question 3, what is the F/M ratio of this activated sludge process?

    - Influent $CBOD_5$ is 205 mg/L
    - Primary Clarifier Removes 24% of the Influent $CBOD_5$
    - MLVSS is 72% of MLSS
    - Three (3) Aeration Tanks Each 220 Feet Long, 45 Feet Wide and 15 Feet Deep

    a. 0.42
    b. 0.13
    c. 0.26
    d. 0.11

5. What adjustment should be made if solids are rising in the secondary clarifier accompanied by small nitrogen gas bubbles?

    a. Increase aeration D.O.
    b. Decrease the RAS rate
    c. Decrease the WAS rate
    d. Decrease aeration D.O.

6. Given the following data, what is the percent removal of $CBOD_5$ through the activated sludge process?

    - Plant Influent Flow Rate is 150 cfm
    - Influent $CBOD_5$ is 185 mg/L
    - Primary Effluent $CBOD_5$ is 139 mg/L
    - Secondary Effluent $CBOD_5$ is 4.2 mg/L

    a. 25.5%
    b. 99.4%
    c. 97.0%
    d. 23.6%

7. What are very small, finely-divided solids known as:

    a. Settleable
    b. Total
    c. Colloidal
    d. Inert

8. What does the term loading refer to?

    a. The pounds of MLVSS under aeration
    b. The cfm of air supplied to the aeration tank
    c. The pounds/day of $CBOD_5$ entering the aeration tank
    d. The amount of waste sludge removed from the system

9. Given the following data, calculate the OUR?

    - Beginning D.O. is 7.1 mg/L
    - Ending D.O. is 2.5 mg/L
    - Test Time is 10 Minutes

    a. 177.5 mg/L/hr
    b. 27.6 mg/L/hr
    c. 17.0 mg/L/hr
    d. 58.4 mg/L/hr

10. What is a typical RAS to Q ratio for an extended aeration activated sludge process?

    a. 10% to 25%
    b. 25% to 50%
    c. 1% to 2%
    d. 75% to 100%