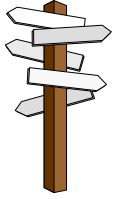# Certification Boulevard

Test Your Knowledge of Miscellaneous Topics – Answer Key

1. What percent of suspended solids is typically removed in a primary clarifier?

   a. 20 to 25%
   b. 100%
   c. **50 to 60%**
   d. 75 to 85%

2. What typically happens to the ORP of final effluent when the ammonia concentration in the effluent decreases?

   a. **The ORP value increases**
   b. The ORP value decreases
   c. The ORP value remains the same
   d. Ammonia concentration has nothing to do with ORP values

3. Which bacteria is responsible for converting nitrite to nitrate?

   a. Heterotrophic
   b. Nitrosomonas
   c. **Nitrobacter**
   d. Facultative

4. What is the liquid effluent called that is removed from an anaerobic digester?

   a. Filtrate
   b. Centrate
   c. **Supernatant**
   d. Subnatant

5. Which factors affect the operation of an aerobic digester?

   a. Detention time
   b. Temperature
   c. Oxygen transfer efficiency
   d. Dissolved oxygen level
   e. **All of the above**

6. What problems can grit cause in treatment process units if it is not removed from the influent flow?

   a. Erosion of valve seats
   b. Take up valuable space in tanks
   c. Erosion of pipe and elbows
   d. Damage pump impellers
   e. **All of the above**

7. Which factors generally affect the amount of sludge that can be applied to a land application site?

    a. **<u>Nitrogen and heavy metals</u>**
    b. Carbon and chlorides
    c. Phosphorus and alkalinity
    d. pH and $CBOD_5$

8. Given the following data, how many total gals/day of sludge are removed from a primary clarifier using a triple piston pump?

- Piston diameter is 12 inches
- Piston length is 14 inches
- Piston speed is 35 spm
- Total run time is 250 mins/day

    a. 59,941 gpd
    b. 65,670 gpd
    c. 119,883 gpd
    d. **<u>179,824 gpd</u>**

3.14 x (12 in. ÷ 12 in./ft ÷ 2) x (12 in. ÷ 12 in./ft ÷ 2) x (14 in. ÷ 12 in.) x 7.48 gal/ft³ x 3 pistons x 35 spm x 250 mins/day = 179,824 gpd

9. Given the following data, what is the pressure equivalent expressed in psi delivered by this pump?

- Pump discharges 600 gpm
- Total dynamic head (TDH) of 250 feet

    a. 235 psi
    b. **<u>108 psi</u>**
    c. 85 psi
    d. 577 psi

250 feet TDH x 0.433 psi per foot of head = 108.2 psi OR
250 feet TDH ÷ 2.31 feet of head per psi = 108.2 psi

10. Given the following data, how many gpd of WAS are removed from this activated sludge facility?

- Aeration volume is 570,000 gallons
- MLVSS is 3,125 mg/L
- Mixed liquor is 76% volatile
- WAS TSS is 9,500 mg/L
- Desired SRT is 20 days

    a. 0.123 mgd
    b. 59,267 gpd
    c. **<u>12,335 gpd</u>**
    d. 25,981 gpd

0.57 MG x (3,125 mg/L ÷ 0.76) x 8.34 lbs/gal = 19,547 lbs MLSS ÷ 20 day SRT = 977 lbs/day to waste ÷ (9,500 mg/L x 8.34) = 0.0123355 mgd x 1,000,000 = 12,335 gpd