

NAME: \_\_\_\_\_

**In Class**

**1. Indicate TRUE or FALSE**

Bacteria are single celled organisms. \_\_\_\_\_

Heterotrophic bacteria need inorganic carbon for growth \_\_\_\_\_

The most common bacteria are the mesophiles (growing at temperatures between 25 and 40°C). \_\_\_\_\_

Algae are photosynthetic. \_\_\_\_\_

During wastewater treatment bacteria oxidize the organic matter (known as substrate). \_\_\_\_\_

Bacteria that can survive in both aerobic and anaerobic environments are known as facultative. \_\_\_\_\_

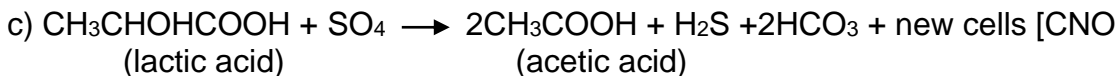
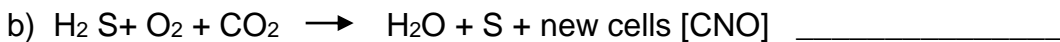
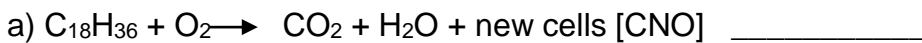
Denitrification is an anaerobic process. \_\_\_\_\_

The standard time for a BOD test is 7 days. \_\_\_\_\_

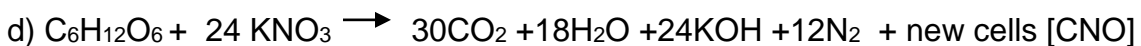
The standard temperature for the BOD test is 30°C. \_\_\_\_\_

An anoxic environment is rich in nitrate and oxygen. \_\_\_\_\_

**2. Indicate whether the following reactions are aerobic, anoxic or anaerobic**



\_\_\_\_\_



\_\_\_\_\_

NAME: \_\_\_\_\_

**3. Fill in the blanks:**

The conversion of ammonia to nitrate by bacteria is called \_\_\_\_\_.

The conversion of nitrate to nitrogen by bacteria is called \_\_\_\_\_.

The removal of pathogens from wastewater before discharge is called \_\_\_\_\_.

4. Dr. Jahan's class is preparing a harmless potion for engineering students for a Halloween event. The organic chemical being used is totally harmless, non toxic, **highly biodegradable and readily oxidized chemically.** The chemical formula of the compound is  $C_{10}H_{20}$  and the concentration prepared is 150 mg/L.

What are the THOD, BOD and COD of the sample? Justify the values of the  $BOD_u$  and COD values. Assume  $BOD_u$  is  $0.85 \cdot COD$ . If the biodegradation rate  $k$  is  $0.25 \text{ day}^{-1}$  what is the  $BOD_5$  in mg/L?

**BONUS:** Indicate the oxidizing agent (electron acceptor) and reducing agent (electron donor) for the reactions presented in question 2.

Remember (Loss of Electrons=Oxidation; Gain of Electrons=Reduction)

	Electron Donor	Electron Acceptor
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____