HOMEWORK ASSIGNMENT – FERMENATATION/DISTILLATION

DIRECTIONS: Briefly define the following terms according to the main topic and in your own words [**THAT MEANS NO COPY AND PASTE**]. Include examples where appropriate.

Fermentation-

Simple distillation-

Fractional distillation-

Condensation-

Specific gravity-

Anaerobic-

Aerobic-

Yeast-

Enzyme-

Zymase-

Zymology (Zymurgy)-

Alcohol-

Ethanol-

Sucrose-

Glucose-

Starch-

1. Which process extracts higher percentage of ethanol (circle one answer)?

Simple distillation Fractional distillation Fermentation

HOMEWORK ASSIGNMENT- FERMENTATION/DISTILLATION (cont.)

Answer the following questions:

Who was Eduard Buechner and how did he win the Nobel prize?

Why is *Saccharomyces cerevisiae* used as the preferred yeast strain used for ethanol fermentation (name the phenomena)?

Describe what distillation does.

What is specific gravity and how is it used to measure the fermentation/distillation process?

How much energy does ethanol contain (energy/volume) when utilized in combustion, consuming, and reacting with water?

What determines the economic benefit of using ethanol for automotive fuel in the U.S?

HOMEWORK TERMINOLOGY – ANAEROBIC DIGESTION

DIRECTIONS: Briefly define the following terms according to the main topic and in your own words [**THAT MEANS NO COPY AND PASTE**]. Include examples where appropriate.

Aerobic digestion-

Anaerobic digestion-

Activated sludge-

Organic material-

Biomass-

Bio-fuel-

Biodegradation-

Renewable energy-

Hydrolysis-

Methane-

Carbon dioxide-

Greenhouse gasses-

Acetogenic microorganisms-

Methanogenic microorganisms-

Mesophilic digestion-

Thermophilic digestion-

Total Dissolved Solids (TDS)-

Total Susspended Solids (TSD)-

Total Volatile Solids (TVS)-

HOMEWORK ASSIGNMENT – ANAEROBIC DIGESTION OF ORGANIC SOLIDS (cont.)

Answer the following questions:

Where is bio-methane most effectively used in the U.S today?

What are the by-products of the anaerobic digestion of organic carbon and nitrogen mixtures, and what microbes perform the process?

Why are temperature and pH important in an anaerobic digestion with regards to the BMP test?

Why is sodium hydroxide used in the gas collection bottle?

Name some factors that affect the digestion reaction rate, and some things that can cause it to fail.

Why are anaerobic digestions an important part of developing a sustainable world besides their potential for biogas production?