

## **GS@IP Senior Biology (A&P and Microbiology) Summer Assignment**

*Answer each of these questions. You may use external sources, but you must reference and cite them in APA format. 1-inch margins, Times New Roman, 12 point, single-spaced. There is no minimum or maximum word requirement for each response, but answer concisely.*

### **Resources:**

**You may use Barron's AP Biology book**

**You may consult Khan Academy**

**You may consult Bozeman Science**

**You may consult other online sites, but make sure it is .org, .edu, or .gov site**

- 1.) How are microbes important to life as we know it? How can microbes be a detriment to life as we know it?
- 2.) Describe the difference between ionic, polar covalent, nonpolar covalent, hydrogen, and Van der Waals interactions/bonds.
- 3.) If you had 2 grams of glucose, how many moles would this be?
- 4.) What is the difference between endergonic and exergonic reactions?
- 5.) Draw 5 water molecules as they would appear if hydrogen bonding. Show both hydrogen and oxygen elements, and label the partial charges of these molecules.
- 6.) Describe the structure and function of carbohydrates, lipids, proteins, and nucleic acids.
- 7.) Even though the standard unit of length is the meter, microorganisms are often measured in \_\_\_\_ or \_\_\_\_.
- 8.) How can you determine the total magnification of an object in the microscope? What is the difference between resolution and magnification?
- 9.) Compare and contrast the following microscopy techniques: compound light, brightfield, darkfield, phase-contrast, DIC, fluorescence, confocal, two-photon, scanning acoustic, transmission electron, scanning electron, scanning tunneling, and atomic force.
- 10.) Compare and contrast: simple stain, differential stain (Gram, acid-fast), and special stain (negative stain, endospore stain).
- 11.) What is the difference between the terms anatomy and physiology?
- 12.) Describe homeostasis, in terms of a receptor, a control center, and an effector. How do feedback mechanisms assist in maintaining homeostasis?
- 13.) Describe and draw (using a model organism of your choosing) the following terms relating to A&P: superior, inferior, ventral, anterior, dorsal, posterior, medial, lateral, proximal, distal, superficial, external, deep, internal, sagittal, frontal, coronal, transverse, cross-section