***Biochemistry Free Response***

**1.** The unique properties of water make life on Earth possible.

 **a)** Select three properties of water and for each property **identify**, **define** and **explain** the property in

 terms of the chemical/physical nature of water.

 **b)** **Describe** how water affects the functioning of living organisms by **explaining** each of the following:

  **(i)** the ability of water to moderate temperature within living organisms and in organisms’

 environments.

  **(ii)** the movement of water from the roots up and out the leaves of plants .

 **(iii)** the role of water as a medium for the metabolic processes of cells.

**2.** All life on Earth is carbon based. Our carbon basis allows for the formation of complex molecules.

 **a)** Atomically speaking, what allows the element carbon to be the backbone of many large, complex macromolecules.

 **b)** Pick three of the four groups of complex carbon based molecules (*macromolecules*) and for each:

 **(i)** **discuss** the structural components of the macromolecule.

 **(ii)** **discuss** two examples of molecules that belong to each of the groups that you chose and briefly **describe** their function.

 **c)** All of these groups of macromolecules are created from *monomers* joining to form *polymers*.

 **Describe** and **explain** the process that joins these molecules.

**3.** Proteins – large complex molecules – are major building blocks of all living organisms.

 **Discuss** each of the following in relation to proteins:

 **a)** the chemical composition and levels of structure of proteins with a specific example of each.

 **b)** the roles of DNA and RNA in protein synthesis.