**Possible Behavior Free Response Questions**

**1.** Seeds that are randomly positioned when planted in a pot of soil placed on a window sill produce seedlings with downward growing roots and upward growing shoots (stems). Above ground, the shoots are oriented toward light.

 **Describe** the biochemical and physiological mechanisms that occur to produce the responses listed below and **explain** how each response is beneficial to the plant.

 **a.** the downward growth of the roots

 **b.** the upward growth of the shoots

  **c.**  the bending of the shoots toward the light

**2.** **Define** photoperiodism. **Describe** three examples of photoperiodism in plants and **explain** how each example gives the

 plant an evolutionary advantage.

**3.** Individual organisms make short-term adjustments to temporary environmental changes in temperature, moisture and light. For each environmental factor, **describe** the biochemical and/or physiological mechanisms by which animals and plants adjust to changes in that factor.

**4.** The activities of organisms change at regular time intervals. These changes are called biological rhythms. The graph below

 depicts the activity cycle over a 48-hour period for a fictional group of mammals called pointy-eared bombats found on an

 isolated island in the temperate zone.



 **(a)** **Describe** the cycle of activity for the bombast in terms of circadian rhythms.

 **(b)** **Propose** a hypothesis regarding the effect of light on the cycle of activity in bombats. **Describe** a controlled experiment that could be performed to test this hypothesis along with a data table containing the results from your

 experiment that support your hypothesis.

  **(c)** **Discuss** how each of the following factors might affect the behavior of the bombats to result in this pattern of activity.

 \* temperature
 \* food availability
 \* presence of predators
 \* social behavior