**Practice FRQ: 2010 AP Exam**

An experiment was conducted to measure the reaction rate of the human salivary enzyme αamylase. Ten mL of a concentrated starch solution and 1.0 mL of α-amylase solution were placed in a test tube. The test tube was inverted several times to mix the solution and then incubated at 25°C. The amount of product (maltose) present was measured every 10 minutes for an hour. The results are given in the table below.

**Time (minutes) Maltose Concentration (**M**)**

|  |  |
| --- | --- |
| 0 | 0 |
| 10 | 5.1 |
| 20 | 8.6 |
| 30 | 10.4 |
| 40 | 11.1 |
| 50 | 11.2 |
| 60 | 11.5 |

1. ***Graph*** *the data on the axes provided and* ***calculate*** *the rate of the reaction for the time period 0 to 30 minutes.*
2. **Explain** why a change in the reaction rate was observed after 30 minutes.
3. ***Draw*** *and* ***label*** *another line on the graph to predict the results if the concentration of -amylase was doubled.* ***Explain*** *your predicted results.*
4. **Identify** TWO environmental factors that can change the rate of an enzyme-mediated reaction. **Discuss** how each of those two factors would affect the reaction rate of an enzyme.

**Practice FRQ: 2008 AP Exam**

The physical structure of a protein often reflects and affects its function.

(a) **Describe** THREE types of chemical bonds/interactions found in proteins. For each type, **describe** its role in determining protein structure.

(b) Abnormal hemoglobin is the identifying characteristic of sickle cell anemia. **Explain** the genetic basis of the abnormal hemoglobin. **Explain** why the sickle cell allele is selected for in certain areas of the world.