

Unit 5 Free Response Questions

Your class will select **three** questions **from the following set** that you must answer. You will also have to answer **two additional questions** that will not be **provided to you prior to the test date**. Your answer to each question is worth a maximum of ten points each.

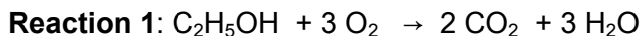
Points are earned in the following ways:

3 pts: English writing conventions – the student writes complete sentences with proper punctuation and grammar. The question is restated in the context of the answer.

4 pts: The answer addresses the question that was asked. Required examples, explanations and illustrations are provided, though they might not be correct.

3 pts: The answer is conceptually correct.

1. In performing a reaction, the test tube in which the reaction is taking place is observed to be getting progressively colder. Describe what is happening in terms of energy flow that would explain this observation. Since energy cannot be destroyed, where is the energy going?
2. The only certain way in which to speed up a chemical process is to increase the temperature. Explain what an increase in temperature does at the **molecular** level and how this increases the reaction rate.
3. During fermentation yeast converts glucose into ethanol and carbon dioxide. This reaction also makes the temperature of its surroundings rise. **What** do we call the **biological** components of the yeast that help get the reaction started, **how** do these biological components do their job, and **how** is that related to the rise in temperature?
4. How many **moles** of glucose, $C_6H_{12}O_6$, would need to be broken down during respiration to produce **132 grams** of CO_2 ? Support your calculation with an explanation of how the relationship between the variables proves that your answer is correct.
5. If you are living in an enclosed colony on Mars you are going to need to produce water for your plants. Keeping in mind that we also want our fellow humans to survive here with the plants, which of the following reactions would be best suited for this task? Justify your response using information provided to you in the balanced chemical equations.



6. Examine the data table provided. Which of the reactions **could** be used as a source of fuel? Which of those would be the **best** source of fuel? Justify your answer.

	Bond Energy kJ	
Reaction	Reactants	Products
1	7,652	5,320
2	4,893	10,279
3	2,968	1,085
4	6,211	7,046
5	9,738	3,764