**Biochemistry and Enzymes Group Review**

1. What is the role of carbon in the diversity of life?
2. Why is matter necessary for biological systems?
3. Explain the uses of CHNOPS in biological systems.
4. How does the structure of water contribute to thermoregulation, transpiration and plasma membrane structure?
5. Why do biological systems need water?
6. Describe a function that requires the conformational change of a protein.
7. How does the difference in carbohydrate structure affect digestion in animals?
8. Discuss the levels of protein structure & the role of specific types of bonds at each level.
9. How do structures of biological molecules account for their function (carbs, proteins, lipids, DNA)?
10. How does the pH change from pH 7 to pH 3?
11. What is a buffer? How do buffers help maintain homeostasis in the body?
12. Discuss how the structure of a protein affects enzyme activity.
13. Explain how pH, temperature, and the concentration of substrate affect enzyme function.
14. Why are enzymes required by living organisms? What roles do they play in living systems? Give several examples besides digestion.
15. Explain the induced fit model of enzyme function.
16. How does the structure of DNA contribute to its roles in protein synthesis and heritability?
17. Why is DNA a good molecule for information storage?
18. Compare the synthesis and decomposition of biological macromolecules.
19. Hydrogen peroxide is broken down to water and oxygen by the enzyme catalase. The following data were taken over 5 minutes. What is the **rate** of enzymatic reaction in mL/min from 2 to 4 minutes?

|  |  |
| --- | --- |
| **Time (minutes)** | **Amount of Oxygen Produced** |
| 1 | 2.3 |
| 2 | 3.6 |
| 3 | 4.2 |
| 4 | 5.5 |
| 5 | 5.9 |

1. In a lab experiment, one enzyme is combined with its substrate at time O seconds. The product is measured in micrograms at 20-second intervals and recorded on the data table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Time (sec)** | 0 | 20 | 40 | 60 | 80 | 100 | 120 |
| **Product (mg)** | 0.0 | 0.25 | 0.50 | 0.70 | 0.80 | 0.85 | 0.85 |

1. What is the initial **rate** of the enzyme reaction?
2. What is the **rate** after 100 seconds?
3. Why is there no increase in product after 100 seconds?
4. What would happen if you added only more enzymes after 100 seconds?
5. What would happen if you added only more substrate after 100 seconds?