NAME _____

LAB TIME/DATE _____

Chemical and Physical Processes of Digestion

Carbohydrate Digestion

The following questions refer to Activity 1: Assessing Starch Digestion by Salivary Amylase.

1. At what pH did you see the highest activity of salivary amylase? _____ Why?

_____

2. How do you know that the amylase did not have any contaminating maltose?

_____

_____

3. What effect did boiling have on enzyme activity? Why? _____

_____

_____

4. Describe the substrate and the subunit product of amylase. _____

_____

The following questions refer to Activity 2: Assessing Cellulose Digestion.

5. Does amylase use cellulose as a substrate? Explain. _____

_____

6. Did freezing have an effect on the activity of amylase? Explain. _____

_____

7. Do you think that the bacterial suspension contained the enzyme cellulase (an enzyme that digests cellulose)? Why or why not?

_____

_____

8. What is the substrate of peptidase? Explain, based upon your results. _____

_____

Protein Digestion by Pepsin

The following questions refer to Activity 3: Assessing Protein Digestion by Pepsin.

9. At which pH did you see the highest activity of pepsin? _____ How does this correlate to the location of pepsin in the body? _____

_____

10. What effect did boiling have on pepsin? _____

_____

11. Was there any digested BAPNA contaminating the pepsin or deionized (DI) water? _____

How can you tell? _____

_____

12. What is the substrate in this experiment? _____

What is the usual substrate for pepsin, and what subunits are formed with pepsin activity?

_____

_____

13. What was the effect of decreasing the incubation time on the optical density results?

_____

14. What effect would decreased incubation temperature have on pepsin activity? Why?

_____

_____

15. What was the significance of using 37°C for the incubation? _____

_____

Fat Digestion by Pancreatic Lipase and the Action of Bile

The following questions refer to Activity 4: Assessing Fat Digestion by Pancreatic Lipase and the Action of Bile.

16. Describe the activity of lipase with and without the addition of bile salts. Refer to Chart 4 for pH values. _____

_____

17. Is the activity of bile a chemical or a physical process? Explain. _____

_____

18. What pH resulted in the maximum pancreatic lipase activity? _____

How does this optimal pH correlate to the enzyme's location in the body? _____

_____

19. Explain whether or not we can determine fat hydrolysis in tube 5. Why or why not?

_____

_____

20. What is the substrate in this experiment? _____

What subunits does lipase form? _____

Physical Process: Mechanisms of Food Propulsion and Mixing

The following questions refer to Activity 5: Studying Mechanisms of Food Propulsion and Mixing: Deglutition (Swallowing).

21. Explain the significance of the movement of the tongue during swallowing. _____

_____

22. Describe three events that occur during the pharyngeal-esophageal phase of deglutition. _____

_____

_____

23. What was the time interval that you recorded between the first and second sound?

_____