Chemistry 30B **Experiment 10**

Lab Partner:_____ Name:_____

_____

Reference Tests

Substances mixed	**Observations of a positive test**
Starch and iodine	
Glucose and Benedict's solution	

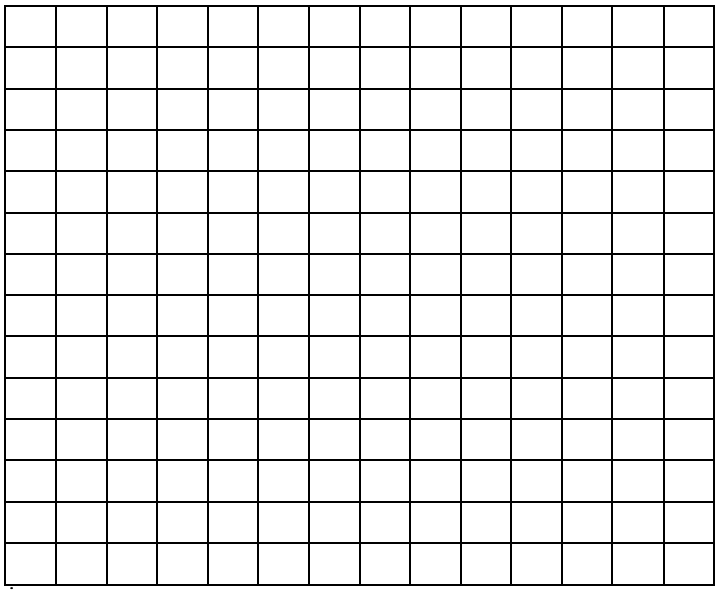
Part 1: Effect of Enzyme Concentration

Time	**Color produced by iodine test AND activity level (0,1,2, or 3)**			
	No amylase	**3 drops amylase**	**6 drops amylase**	**10 drops amylase**
0 minutes				
5 minutes				
10 minutes				

	Color produced by Benedict's Test			
	No amylase	**3 drops amylase**	**6 drops amylase**	**10 drops amylase**
Benedict's Test				

Graph of enzyme activity level vs. enzyme concentration

Enzyme activity level



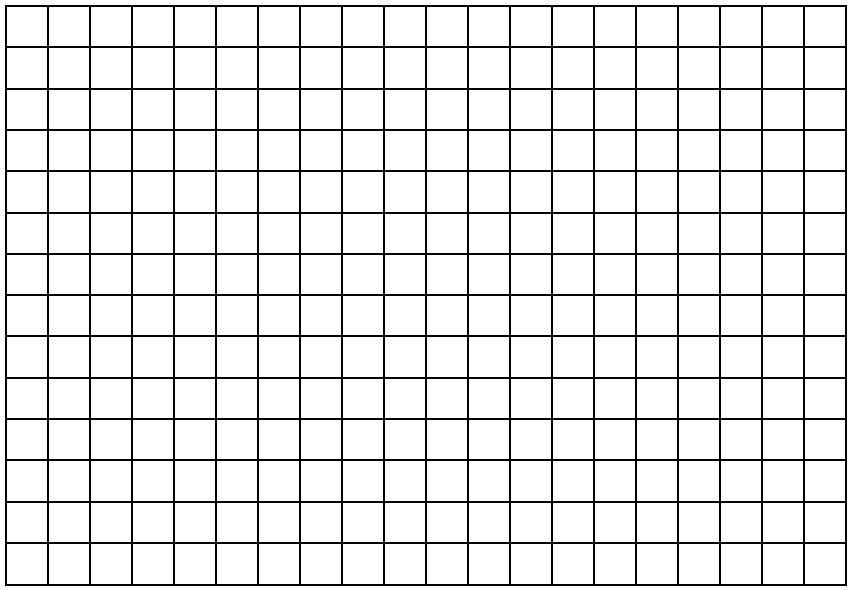
Drops of amylase solution

Part 2: Effect of Temperature

Color produced by iodine test AND activity level (0,1,2, or 3)		
0°C	**37°C**	**100°C**

Graph of enzyme activity level vs. temperature

Enzyme activity level



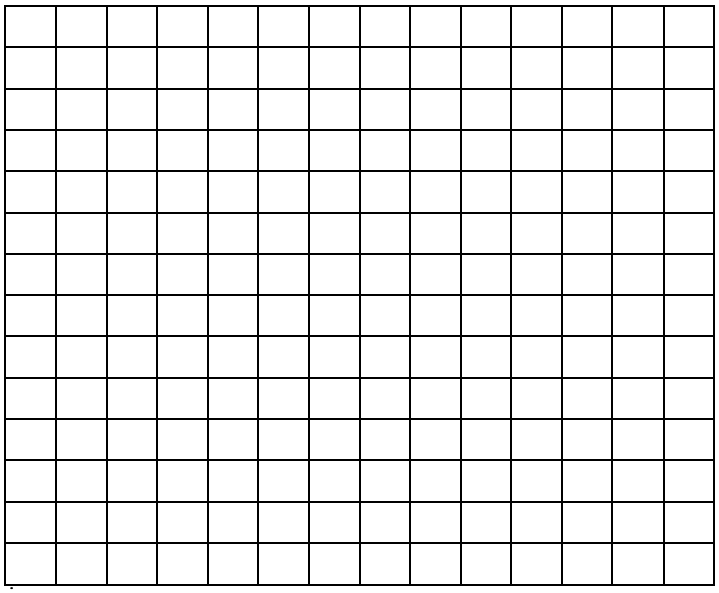
Temperature (°C)

Part 3: Effect of pH

Color produced by iodine test AND activity level (0,1,2, or 3)			
pH 2	**pH 4**	**pH 7**	**pH 10**

Graph of enzyme activity level vs. pH

Enzyme activity level



pH

Part 4: Effect of Inhibitors

Color produced by iodine test AND activity level (0,1,2, or 3)		
NaCl	**Ethanol**	**Inhibitor:**

Questions

1. What is the substrate of the enzyme α–amylase?

2. What are the products of the hydrolysis of the substrate?

3. In part 1, at which enzyme concentration was starch hydrolyzed the fastest? Slowest?

4. Describe the effect of enzyme concentration on enzyme activity.

5. In part 2, what was the optimum temperature for amylase?

6. Why did the enzyme activity differ at 0°C and at 100°C?

7. How is the activity of amylase affected by a low pH? By a high pH? Explain.

8. What was the optimum pH for amylase?

9. Pepsin hydrolyzes proteins in the stomach. The pH in the stomach is 2, and the optimum pH for pepsin is 2. What do you think would happen to the activity of pepsin when it reaches the small intestine, where the pH is 8? Explain why.

10. In part 4, in which reaction mixtures did hydrolysis of starch occur?

11. What substances added to the mixtures were inhibitors?

12. Explain how an organic solvent like hexane could inhibit enzyme action.

13. Explain how addition of base could inhibit enzyme action.