Biology 1st Semester Study Guide Name _____ Hour ____

Directions: Complete the following questions in the space below.

**hapter 1**

1. Identify the 6 characteristics of all living things and briefly describe each.

2. Define the following terms and give an example of each:
   a. Observation-

   b. Hypothesis-

   c. Theory-

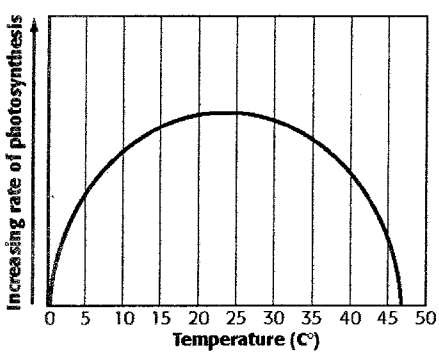
   d. Conclusion-

3. How are the experimental and control group related?

4. Explain the relationship between autotrophs and heterotrophs?

5. What molecule is responsible for carrying out the blue prints for growth and development of a cell? What does it stand for?

6.




**Graph 2**

A. At what temperature is the rate of photosynthesis the greatest?

B. Explain how you came to this conclusion.

7.

| PLANT | TREATMENT | NUMBER OF BLOSSOMS | | | |
|---|---|---|---|---|---|
| | | DAY 30 | DAY 35 | DAY 40 | DAY 50 |
| 1 | Water w/ Megagrow | 7 | 15 | 23 | 25 |
| 2 | Water w/ Megagrow | 9 | 21 | 24 | 26 |
| 3 | Water w/ Megagrow | 6 | 18 | 21 | 22 |
| 4 | Water Only | 0 | 0 | 3 | 5 |
| 5 | Water Only | 3 | 6 | 10 | 11 |
| 6 | Water Only | 2 | 6 | 9 | 13 |

A. Which plants represent the control group?

B. Plant # 4's data is out of line with regards to the other data. What do we do with this data?

C. How could this study be improved?

8. List the subatomic particles and their charges.

9. What is the difference between covalent and ionic bonds?

10. What is a catalyst?

11. What acts as a catalyst in cells?

12. Describe the polar charge on a water molecule.

13. What do all organic compounds have in common?

14. List the 4 macromolecules, their monomers.

Graph the following:

| Rate of Activity (Enzyme X) | Rate of Activity (Enzyme Y) | Temp. (°C) |
|---|---|---|
| 3% | 0% | 0 |
| 20% | 12% | 10 |
| 45% | 22% | 20 |
| 57% | 44% | 30 |
| 65% | 56% | 40 |
| 2% | 62% | 50 |
| 0% | 68% | 60 |
| 0% | 70% | 70 |
| 0% | 71% | 80 |
| 0% | 72% | 90 |
| 0% | 0% | 100 |

15. Using the graph above, at what temperature does enzyme X and enzyme Y have the same rate of activity?

16. What is the optimal temperature for each enzyme?

17. Which enzyme is active over the smallest (narrowest) temperature range?

18. $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$ Label the reactants and the products.

19. What limits cell size?

20. Differentiate between prokaryotes and eukaryotes. Give an example of each.

21. List the function of the following organelles:

a. Mitochondria-

b. Cell Membrane-

c. Ribosomes-

d. Golgi Apparatus-

e. Nucleus-

f. Vacuole (plant/animal)-

g. Chloroplast-

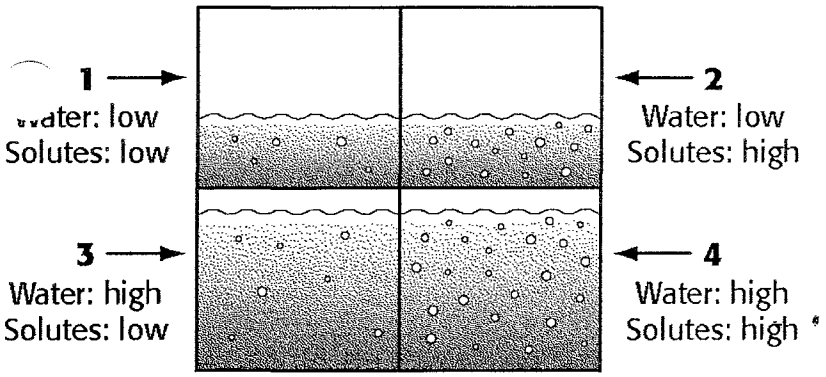
h. Endoplasmic Reticulum-

22. Use the organelles above to draw a plant and animal cell. Be sure to label the organelles.

23. List, in order, the correct order of organization of structures in living things.

24. Determine the power of magnification of an object viewed at high power (40x).

**Concentration of Water and Solutes in Four Adjacent Cells**




*It is assumed that the membrane is permeable to water and solute.*

25. Refer to the illustration above, into which compartment will the water in compartment 3 move?

26. Refer to the illustration above, into which compartment will the solute in compartment 4 move?

27. What is the difference between diffusion and osmosis?

28. Compare and contrast endocytosis and exocytosis.

29. State the difference between pinocytosis and phagocytosis.

30. A cell is placed in a solution where the cell swells. Is the concentration of the solution hypertonic, hypotonic, or isotonic?

31. Where does the source of all energy originate?

32. Define photosynthesis. What is the role of chlorophyll in photosynthesis?

33. Write a balanced equation for photosynthesis.

34. Write a balanced equation for respiration.

35. What is the relationship between the two equations above? (from questions 33 and 34)

36. What is the major atmospheric byproduct of photosynthesis AND where does it come from?

37. What is the purpose of ATP?

38. Define Glycolysis and state where it occurs in the cell.

39. Define aerobic respiration and where it occurs in the cell.

40. What are the 3 parts of cellular respiration?

41. Describe the phases of the cell cycle.

42. Which phase of the cell cycle is the longest?

43. List in order the phases of mitosis and provide a distinguishing characteristic of each.

44. Draw an example of each phase of mitosis.

45. In mitosis, how do plant and animal cells differ during cytokinesis.

46. What is the goal of mitosis as it relates to the chromosome number?

47. How does cell division differ in prokaryotes and eukaryotes.