Name: _____ **Date:** _____

First Semester Review Guide

INTRODUCTION

1. Name the two categories of chemical reactions

2. What does exergonic refer to? Which has more energy in this type of reaction, the reactants or products?

3. What does endogonic refer to? Which has more energy in this type of reaction, the reactants or products?

4. Briefly describe what is meant by activation energy?

5. Briefly describe why raising the heat in a system facilitates chemical reactions (both exergonic and endogonic) to occur.

6. Draw a graph that indicates an exergonic reaction (be sure to label both axis).

7. Compare the rate of a reaction that possesses high activation energy to one that possesses low activation energy.

8. Enzymes are catalysts that are synthesized by living organisms; what kind of biological molecules are catalysts?

9. What is meant by the active site of an enzyme?

10. Name the substrate and the enzyme use in the catalase lab.

11. What was the effect on the reaction when substrate was increased?

12. What was the effect on the reaction when enzyme was increased?

13. Briefly describe what is meant by the “lock and key” model of enzyme action.

14. Why is the “induced fit” model a more widely accepted model?

15. How do enzymes speed up the rate of chemical reactions?

Biochemistry

16. If I told you I was holding an atom with the atomic number of 5, could you tell me it was _____? What does atomic number refer to _____ ? If I further told you it was a neutral atom, you could tell me it had how many electrons _____ _____ ? How do you know that _____ ?

17. What keeps electrons in orbit around the nucleus?

18. How are ions and isotopes similar? How are they different?

19. What kind of bond will Na and Cl make? How do you know?

20. How are ionic and covalent bonds different? Compare their strengths to that of a hydrogen bond.

21. Diagram the range of the pH scale and label the areas which measure correspond to highly and lowly acidic and basic solutions and neutral solutions.

22. How are strong and weak acids different? (Note: different pH values are not a sufficient answer)

23. Fill in the table on the following page.

Organic Molecule	Monomer	Chemical Structure	Significance/ Function

Cellular Transport

24. Explain what is meant when an object is described as being selectively permeable and give an example of a selectively permeable object.

25. Why is it necessary for the cell membrane to control what type of substances enter and leave the cell.

26. Diagram the fluid mosaic model for the plasma membrane. Be sure to label the polar and non-polar areas, hydrophilic and hydrophobic areas, the inside and outside of the cell and a brief explanation of why the phospholipid molecules align themselves the way that they do.

27. Compare and contrast plant and animal cells.

28. Compare and contrast eukaryotic and prokaryotic cells.

29. Use the terms Brownian motion, concentration gradient and dynamic equilibrium in a brief explanation of diffusion. Draw and label a diagram if necessary.

30. Compare and contrast a hydrophobic and hydrophilic solution.

31. Compare and contrast hypotonic, hypertonic and isotonic solutions.

32. Completely explain why turgor pressure would increase if a cell were placed in a hypotonic solution.

33. Is facilitated diffusion considered active or passive transport? Explain your answer and describe the process of facilitated diffusion.

34. How is active transport different from facilitated diffusion?

CELL REPRODUCTION

35. What are chromosomes? When are they visible?

36. What is the name of the genetic material during most of the cell cycle?

37. Name the phase of the cell cycle that accounts for the majority of cell growth.

38. What happens to chromosomes during interphase?

39. What is the name of the first and longest phase of interphase?

40. What is the term that describes the two halves of duplicated genetic material in a chromosome? Compare the genetic material in these two halves.

41. Name the structure that holds sister chromatids together.

42. Describe what happens to the nuclear envelope (membrane) during prophase.

43. Describe the structure of the spindle/centriole and the function of the spindle fibers.

PHOTOSYNTHESIS/CELL RESPIRATION

44. Name the organelle in green plands where photosynthesis occurs -_____? What is the name of the pigment contained in the organelle - _____? What frequencies of light are absorbed and reflected by this pigment?

45. Write the general equation for photosynthesis.

46. How is energy stored in the ATP molecule? How is it released?

47. Fill in the table below:

Reaction	Things Needed	Things Produced
Light Rxn.	1.	1.
	2.	2.
	3.	3.
Calvin Cycle	1.	1.
	2.	
	3.	

48. Write the general equation for cell respiration.

49. The first step of cell respiration is _____. _____ molecules of ATP are required to fuel this process, however _____ ATP molecules are created as a result, so there is a net energy production of _____ ATP molecules.

50. Glycolysis occurs in what part of the cell?

51. If oxygen is present, respiration will continue in what part of the cell?

52. Name two types of respiration that can occur anaerobically.

53. After intense or strenuous exercise, our muscles can often feel as if they are burning. Using what you know about cellular respiration (both anaerobic & aerobic) explain why this occurs and why our rate of breathing will increase.

54. Name the final electron acceptor in the electron transport chain of Cell respiration.

CELL REPRODUCTION

55. What are chromosomes? When are they visible?

56. What is the name of the genetic material during most of the cell cycle?

57. Name the phase of the cell cycle that accounts for the majority of cell growth.

58. What happens to chromosomes during interphase?

59. What is the name of the first and longest phase of interphase?

60. What is the term that describes the two halves of duplicated genetic material in a chromosome? Compare the genetic material in these two halves.

61. Name the structure that holds sister chromatids together.

62. Describe what happens to the nuclear envelope (membrane) during prophase.

63. Describe the structure of the spindle/centriole and the function of the spindle fibers.