NAME:_____

BIOLOGY: FIRST SEMESTER FINAL REVIEW

100 POINTS Due the day of your final

Use the **book, science notes and any handouts** to complete the following questions:

SAFETY:

1. List the 5 most important rules that are used in a safe biology lab.

_____

_____

_____

*** **(Hint: Remember: If in doubt about a problem in lab, ask your teacher!)**

2 What are MSDS files (Material Safety Data Sheets) and why are they important?

_____

3. How do you make a wet-mount slide? _____
4 How do you properly carry a microscope? _____
5. What needs to be done to a microscope before it is stored? _____

_____

SCIENTIFIC METHOD:

6 List some examples of what can be measured in liters, grams, and meters. _____

_____

7. What is the scientific method and label the 5 steps? _____

_____

*** **When conducting an experiment, what is the .....) Define the terms below:**

8. Hypothesis: _____
9. Experimental set-up: _____
10. Independent and Dependent Variable: _____

_____

11. Conclusion: _____

*** **Applying the Scientific Method:**

A green plant was placed in a test tube and a light was placed at varying distances from the plant. The bubbles of oxygen that were given off by the plant were counted. The chart below shows the information that was collected.

Distance of light from plant (cm)	**Number of Bubbles per minute**
10	60
20	25
30	10
40	5

12. What is the **variable** for this experiment? _____ The **control**? _____
13. What does the information in the table above represent? _____

14. What conclusions could be drawn from the information? _____

_____

*** **A scientific experiment is considered invalid if the data is changed or destroyed.**

15. Explain why: _____

_____

_____

BIOCHEMISTRY:

... Intro Chemistry

16. List the differences between acids and bases. _____

_____

17. What is the difference between ionic and covalent bonds? _____

_____

18. Define the following properties of water:
    a. adhesion _____
    b. cohesion _____
    c. capillary action _____
    d. evaporative cooling _____
    e. surface tension _____
    f. hydrophobic _____
    g. hydrophilic _____

19. What is the **range of the pH scale**? _____
    a. Which part of the scale indicates an acid? _____ base? _____ neutral? ____
    b. Which part has the highest concentration of H^+ ions?_____ OH^- ions?_____

... Organic Chemistry

20. Describe the characteristics of living things? _____

_____

21. Compare and contrast sexual and asexual reproduction. _____

_____

22. List the functions and the building blocks of each:
    a. carbohydrates _____
    b. lipids _____
    c. proteins _____
    d. nucleic acids _____

23. What is the ratio of Carbon, Hydrogen and Oxygen atoms in carbohydrates? _____

24. What are enzymes (include active site and substrate)? _____

_____

25. Which **element is common** to **all** organic compounds? _____

26. What is the **most abundant compound** found in living organisms? _____

MICROSCOPE:

27. A microscope is a delicate instrument. It should always be carried with _____ hands.

28. Total magnification on a microscope is calculated by _____ the ocular lens with the objective lens.

29. Compare and contrast the terms magnification and resolution. _____

_____

30. Find the TOTAL magnification for each of the following:

Lens		Total Magnification
Ocular lens:	10x	
Low Objective:	4x	_____
Medium Power Objective:	10x	_____
High Power Objective :	40x	_____

31. List the functions of each of the following:
    a. Stage _____
    b. Stage Clips _____
    c. Coarse Adjustment _____
    d. Fine Adjustment _____

CELLS to SYSTEMS/HOMEOSTASIS:

32. What do the root words *cyto-* and *–ology* mean? _____

33. Define homeostasis: _____

34. List the three parts of the cell theory: _____

_____

35. Give the **function** of each of the cell parts below. **Indicate** if each is found in plants, animals, or both:

a. mitochondira _____
b. nucleus _____
c. ribosomes _____
d. centriole _____
e. cell wall _____
f. cell membrane _____
g. chloroplast _____
h. endoplasmic reticulum _____
i. lysosomes _____
j. Golgi apparatus _____
k. cytoskeleton _____
l. vacuole _____
m. cilia and flagella _____

36. Distinguish between:

a. prokaryotes and eukaryotes _____
_____

b. autotrophic and heterotrophic _____
_____

c. diffusion and osmosis _____
_____

d. multi-cellular and single cell (how the cells would be different) _____
_____

37. List three ways that a plant cell is different than an animal cell:

1. _____
2. _____
3. _____

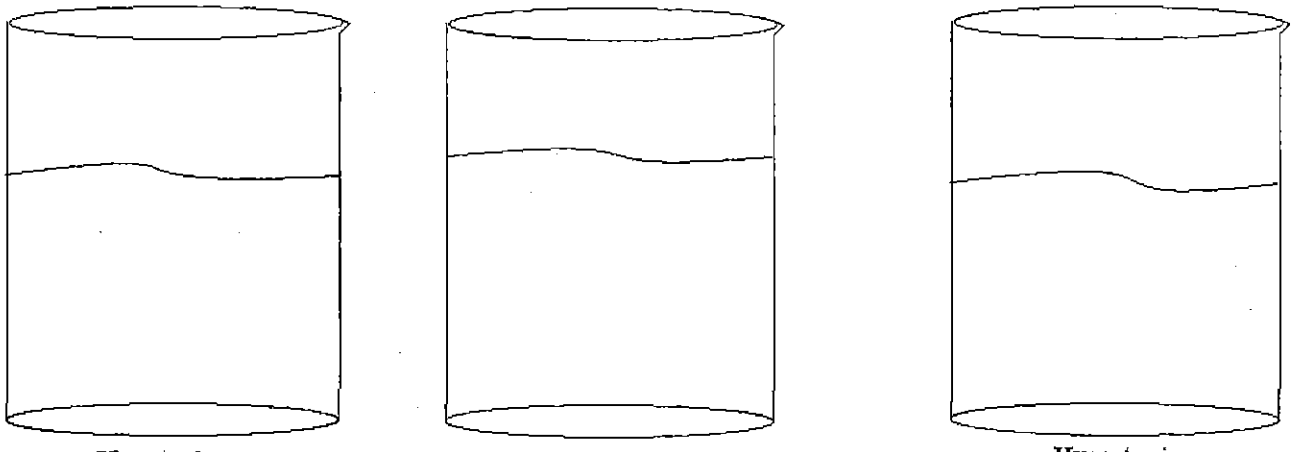
DIFFUSION and OSMOSIS:

38. Compare and Contrast passive and active transport. _____
_____

39. Diffusion is where molecules move from an area of _____ _____ to an area of _____ _____.

40. _____ is the diffusion of water.

41. Draw a picture (size) of a cell in the following situation/solutions- **draw arrows** showing fluid movement:



Hypotonic **Isotonic** **Hypertonic**

CELLULAR RESPIRATION & PHOTOSYNTEHSIS:

42. What is the chief energy storing molecule called? _____
43. Where is ATP (energy) stored? _____
44. What are the 2 types of cellular respiration? _____ and _____
45. Energy is released when _____ are broken.
46. The process by which glucose molecules are broken down to release energy is called _____.
47. How many ATP molecules are produced through aerobic respiration? _____anaerobic respiration?_____
48. Define aerobic respiration: _____
49. Define anaerobic respiration: _____
50. List the 3 phases of cellular respiration in the correct order that it happens: _____
51. What are the products of **glycolysis**? _____
52. How many ATP molecules are produced during **electron transport**? _____
53. Name the 2 types of anaerobic respiration: _____ and _____.
54. Write the balanced chemical formula for Cellular Respiration:

55. Where does cellular respiration occur in an animal cell? _____
56. Write the balanced chemical formula for Photosynthesis:

57. What gas is given off by animals that plants need for photosynthesis? _____ What gas is given off by plants that animals need for cellular respiration? _____
58. Where does photosynthesis take place in a plant cell? _____

MITOSIS and MEIOSIS:

59. Draw, label, and explain the parts/functions of the cell cycle.

60. List, label and draw the 4 phases of mitosis. (PMAT)

61. What is cytokinesis in plant and animal cells? _____

62. Compare the production of eggs and sperm by giving the number of starting/ending cells and the chromosome number for each. (hint-1 vs. 4 and 1n vs. 2n)

Oogenesis _____

Spermatogenesis _____

63. Define the following terms:

a. haploid _____

b. gamete _____

c. fertilization _____

d. diploid _____

e. zygote _____

f. chromosome _____

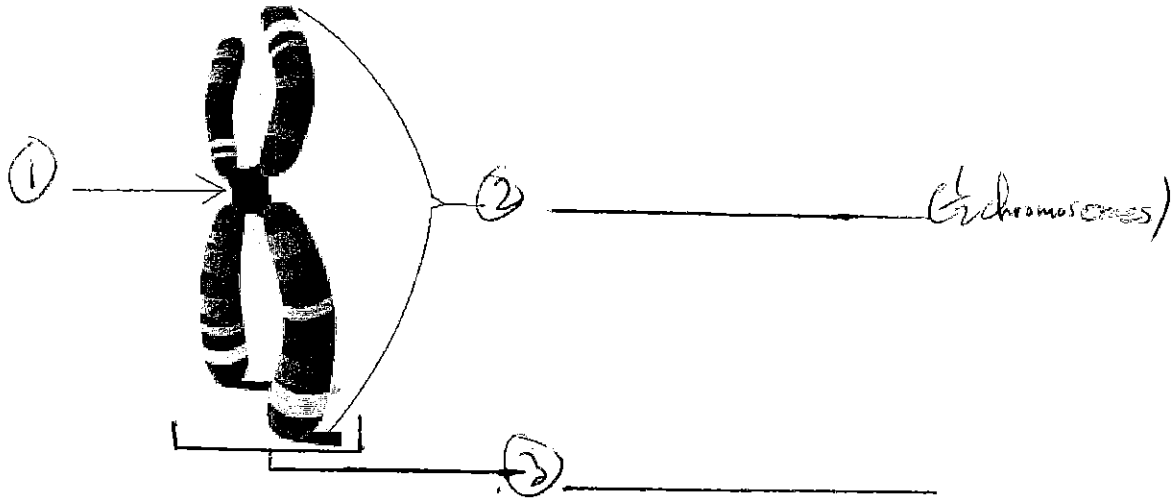
g. centromere _____

h. chromatin _____

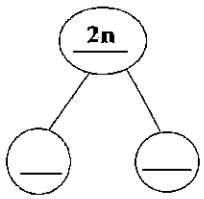
i. sister chromatid _____

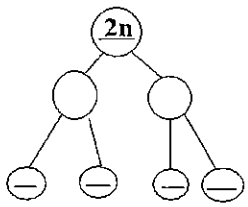
j. crossing-over _____

64. Label the following structures on the picture below:



65. Label the following diagrams as mitosis or meiosis and fill in the circles- haploid (1n) or diploid (2n).





_____ _____

DNA/RNA/PROTEIN SYNTHESIS:

66. What sugar is found in DNA? _____ RNA? _____

67. Give the structure and function of the following:

a. **DNA**

* What are the **4 bases** that make up DNA? _____, _____, _____ and _____.
* What pairs with what? _____ - _____ and _____ - _____
* What are the 3 parts of a nucleotide? _____
* What is **replication** and where does it occur? _____
* What are the weak bonds that hold the nitrogen bases together? _____

* Draw a sequence of what a DNA molecule looks like and label the nucleotide structures. (phosphate, sugar, and base)

b. **RNA**

* What are the **4 bases** that make up RNA? _____, _____ _____ and _____.
* What pairs with what? _____ - _____ and _____ - _____
* List 3 ways a RNA molecule **differs** from a DNA molecule: _____ _____
* What is **transcription** and where does it occur? _____
* What is the function of:
  - mRNA _____
  - tRNA _____
  - rRNA _____
* What is **translation** and where does it occur? _____ _____
* What cell organelle **packages** the protein and "**ships it out**" of the cell? ___ _____.
* What substances link up to form proteins (the building blocks of proteins)? _____ _____

PUTTING OUR BIOLOGY CONCEPTS TOGETHER:

68. Explain why **protein synthesis** is so important to living organisms!

69. For the following kingdoms, write whether they are Autotrophic/Heterotrophic and Prokaryotic/Eukaryotic- **Explain why.**

Archeaebacteria **Bacteria** **Protista** **Fungi** **Plantae** **Animalia**

70. Make a concept map with arrows showing how the levels of biological organization occur in order. **Start with smallest structure and go to the largest:**

Organism Biosphere Organ System Biomes Macromolecules
Species Ecosystems Cells Tissues Organs Atoms