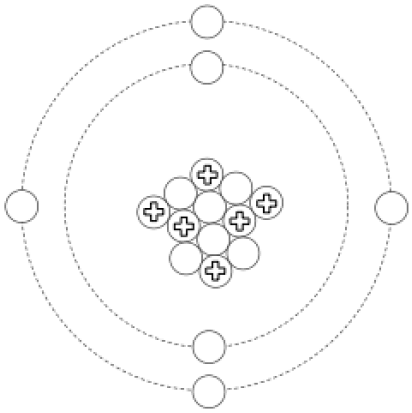
Honors Biology
End of Year Review

Due Wednesday April 13th!

Name: _____ Period: _____

End of Year Review #II

To review for the end-of-year test, complete the following questions. Use your notes as reference material! See how much you can answer without your notes first! Then go back as needed.



1. On the diagram to the right, label all subatomic particles on the atom below. For each item, identify the charge of the subatomic particle.

2. For each of the following bond types, describe the bond type and draw a diagram to show what the bond "looks like".
    a. Hydrogen bond

    b. Covalent bond

    c. Ionic bond

3. Describe the difference between organic and inorganic molecules.

4. Describe the difference between a monomer and a polymer.

5. For each macromolecule, give the function, where it can be found, an example, and the monomer and polymer.
    a. Nucleic acid

    b. Protein

    c. Lipid

    d. Carbohydrate

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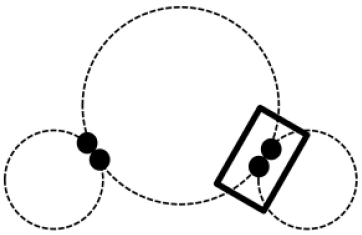
6. To the right is a diagram of a water molecule. Label it with the following items: oxygen atom(s), hydrogen atom(s), electron(s), covalent bond(s), slight negative charge, slight positive charge.



7. Describe why water is called a POLAR molecule.

8. Polarity in water molecules leads to hydrogen bonding among the water molecules. Describe why this occurs.

9. Describe the following properties of water and why each is important in living organisms:
   a. Adhesion

   b. Cohesion

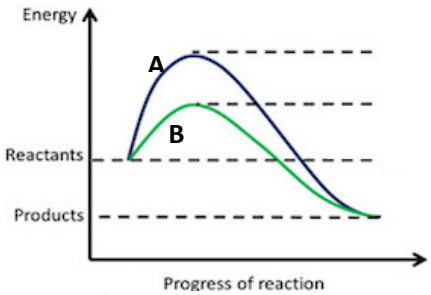
   c. Capillary action

   d. Heat capacity

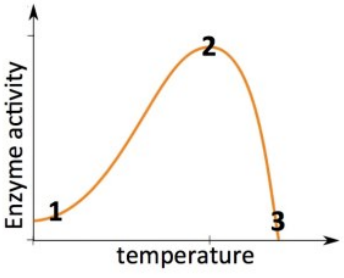
   e. Universal solvency

10. Enzymes are catalysts. Describe what this statement means then describe how enzymes work in chemical reactions.

11. The graph to the right shows the change in energy for a particular chemical reaction. For this chemical reaction, Line A demonstrates the reaction WITHOUT an enzyme. Is this statement true? If yes, why? If no, why?



12. The graph on the right shows the activity of a particular enzyme in different temperatures. Describe what information can be collected from this diagram.



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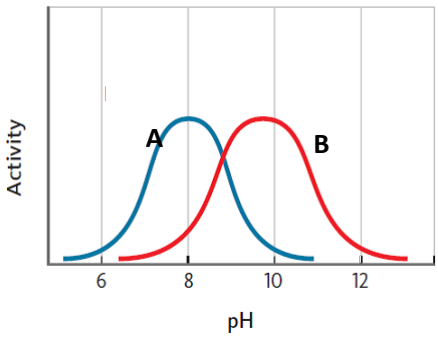
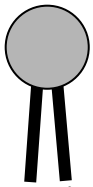
13. The graph on the right compares arginase, catalase, and ligase, three enzymes that have very different environments and activities. Arginase works to breakdown nitrogen-containing waste products that are filtered from the blood by the liver, where the pH is approximately 9.7. Catalase is present in all human cells to breakdown hydrogen peroxide (H_2O_2), which is a toxic molecule to cells. Catalase has its highest activity rate (speed) at a pH between 6.8 and 7.0. Ligase is an enzyme that builds new DNA molecules. It has an optimal pH range of 7.6 to 8.0. Identify which line is which enzyme given the listed information and the diagram provided.



14. List the three statements of the cell theory.
    a.
    b.
    c.
15. List the three structures that ALL cells have.
    a.
    b.
    c.
16. Describe the similarities and differences between eukaryotic and prokaryotic cells.
17. Describe the similarities and differences between plant and animal cells.
18. Below is a phospholipid. Label the two components of the phospholipid and describe its chemical behavior (i.e. hydrophilic or hydrophobic?).



19. Diagram how phospholipids interact with each other to form a BILAYER. WHY do the phospholipids arrange themselves in this way?
20. Compare and contrast active vs. passive transport. Which requires energy? Which doesn't? Which has molecules move from high to low? Which has molecules move from low to high?

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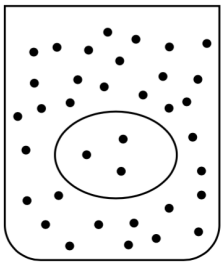
21. In the diagram to the right, the black dots represent a solute dissolved in water. The oval represents a cell. Use arrows to show how the water will move in or out of the cell given the concentration of solute. WHY will water move in or out of the cell? Is the solution the cell is floating in hypertonic, isotonic, or hypotonic?



22. Identify the function of each of the following cell structures:
    a. Cell membrane
    b. Cell wall
    c. Cytoplasm
    d. Nucleus
    e. Ribosome
    f. Mitochondrion
    g. Chloroplast
    h. Vacuole
    i. Flagellum

A. Photosynthesis
B. Cellular Respiration
C. Both Photosynthesis & Cell Respiration
D. Neither Photosynthesis or Cell Respiration

23. _____ Occurs in the cytoplasm and the mitochondria
24. _____ Occurs only in plant cells
25. _____ The light dependent and independent reactions are a part of this reaction
26. _____ Occurs in the chloroplast
27. _____ The Kreb's cycle, glycolysis, and electron transport chain reactions are a part of this reaction
28. _____ Occurs in plant and animal cells

29. Give the reactants and products of photosynthesis: _____

30. Give the reactants and products of cell respiration: _____

Photosynthesis:

A. Light Independent
B. Light Dependent
C. Kreb's Cycle
D. Electron Transport Chain
E. Glycolysis

41. _____ Requires an external light source. Transfers light energy into a usable form as bonds of ATP.
42. _____ Does not require light energy. Uses ATP bond energy to build glucose molecules from CO_2.

Cellular Respiration:

43. _____ Occurs in the mitochondria. Continues to breakdown glucose transferring the bond energy to high-energy electrons.
44. _____ Occurs in the cytoplasm. The first step with the initial breakdown of a glucose molecule.
45. _____ Occurs in the mitochondria. Requires high-energy electrons to transfer energy into ATP at the end of cellular respiration.