Name _____

Unit 1: Biochemistry Study Guide

1. Fill in the chart below to review the 4 biomolecules:

Polymer (Big Molecule)	Monomer (building block)	Function
Protein		
	Glycerol and 3 Fatty Acids	
		Blueprint for life

2. Write the biochemical reaction pattern for the following 2 common cellular reactions using the 3 terms provided (BIG molecule, BB, H_2O)

CONDENSATION: _____ + _____ → _____ + _____

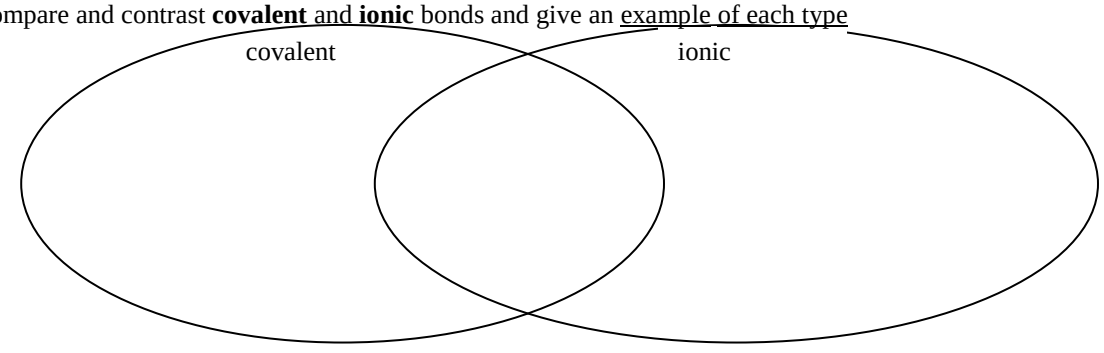
HYDROLYSIS: _____ + _____ → _____ + _____

3. What 3 letters do most carbohydrates end with? _____

4. An atom of Magnesium has an <u>atomic number</u> of **12** and an <u>atomic mass</u> of **25**. Draw both the **Bohr** energy-level diagram and the **dot** diagram for this magnesium atom below.

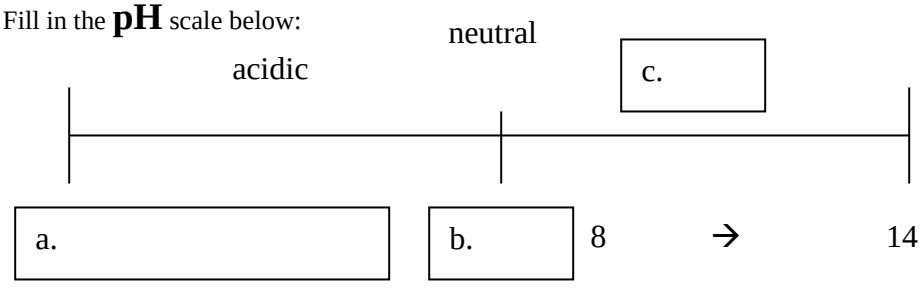
5. Is this atom of Magnesium a **stable & <u>nonreactive</u>** atom or a **<u>reactive</u> atom likely to form chemical bonds** …Explain ?

6. Compare and contrast **covalent** and **ionic** bonds and give an <u>example of each type</u>

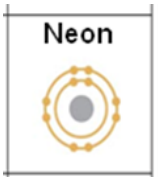


7. The weak attraction between the partial opposite charges of polar water molecules is known as:_____

8. Fill in the **pH** scale below:



9. How many protons are in the nucleus for this neon atom _____ ?

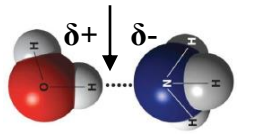


10. Explain with an example from class what it means in chemistry if "**Like Dissolves Like**"

11. Compare **cohesion** and **adhesion** of water and then explain an example of each that you observed in class.

12. Match the chemical bond that is seen in the diagram(s) below.

Chemical Bond Choices:
Ionic Nonpolar Covalent Polar Covalent Hydrogen



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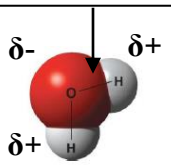

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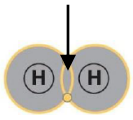

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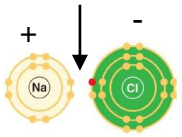

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Analogy Comparisons:

13. Kansas City : Chiefs :: Ray-Pec : _____
14. monomer : polymer :: monosaccharide : _____
15. sharing electrons : covalent :: _____ : ionic bond
16. proton : positive :: _____ : neutral
17. RNA : Nucleic Acid :: cholesterol & hormones : _____
18. polysaccharide : carbohydrate :: polypeptide : _____
19. Insulin & antibodies : protein :: glycogen : _____
20. starch : plants :: _____ : animals
21. water : polar :: lipid : _____
22. weak acid : pH 6 :: weak base : _____
23. break down polymer : hydrolysis :: build polymer : _____

24. Match the following carbohydrates to the appropriate place in the table below:

Carbohydrate Molecules:
lactose starch glycogen sucrose glucose cellulose fructose chitin

Monosaccharides	Disaccharides	Polysaccharides

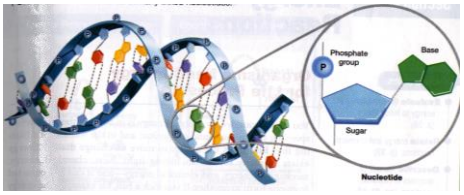
25. Match the following molecule examples to the appropriate biomolecule group with a check mark.

Molecule Examples	Carbohydrate	Lipid	Nucleic Acid	Protein
1. starch				
2. enzyme				
3. oil				
4. steroid hormone				
5. glucose				
6. Glycerol				
7. glycogen				
8. DNA				
9. cellulose				
10. muscle				
11. plant pigments				
12. hemoglobin				
13. gluten				

LABEL each biomolecule diagram:

Carbohydrate	Protein	Water
Lipid	Nucleic Acid	

26.



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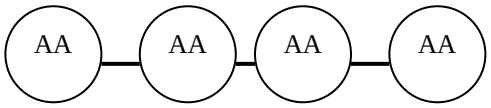

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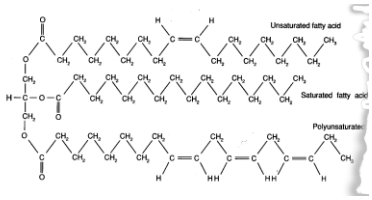

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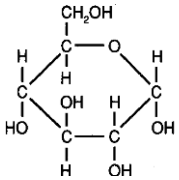

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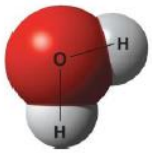

32. McMush Lab: Recap

Biomolecule Tested	Chemical Indicator Used	+ result color change	+ control (positive)	-Control (negative)	McMush Results Yes or No
	Biuret Reagent				

33. What is the purpose for having a **positive** control in a lab experiment like the McMush Lab?

34. What is the purpose for having a **negative** control in a lab experiment like the McMush Lab?

35. Which of the following are likely reasons why the negative control test tube (#1) at the glucose lab station suddenly started giving all students in 4th period a **positive result** (turned orange) when results from all students in the previous 3 periods had been negative for glucose?

a. the Benedicts's solution expired and quit working
b. the hot water bath was too cool
c. the saliva enzymes donated fresh for 4th period were contaminated with glucose
d. someone spilled glucose into the hot water bath water at the end of period 3
e. someone spilled glucose into the Benedicts solution at the end of period 3
f. someone didn't clean a test tube properly at the end of period 3 and left some glucose in it.
g. the saliva enzymes donated fresh for 4th period didn't work correctly

36. Match the following molecule FUNCTIONS to the appropriate biomolecule group with a check mark.

Molecule FUNCTIONS	Carbohydrate	Lipid	Nucleic Acid	Protein
1. creates a "spiderweb" to begin blood clotting				
2. dense, long-term energy storage / insulation in animals				
3. stores genetic instructions				
4. used to build cholesterol and hormones				
5. used to build muscle tissue for movement				
6. captures sunlight energy				
7. contains quick-burning energy storage for cell use				
8. carries oxygen through the blood for cell use				
9. labels germs for destruction by the immune system				
10. used to build a protective wall around plant cells				
11. used to build hair, fingernails, tendons, ligaments				
12. used to build a protective exoskeleton for insects				
13. used to build cell membranes				
14. used to store energy in muscles for exercise				

37. Which of the following lists contains ONLY **proteins**?

a. hemoglobin, cholesterol, antibodies, muscles
b. muscle, insulin, glycogen, hemoglobin
c. antibodies, muscles, insulin, collagen
d. collagen, insulin, hemoglobin, glycerol

38. Which of the following lists contains ONLY **lipids**?

a. cholesterol, chlorophyll, estrogen, fat
b. fat, cholesterol, starch, wax
c. estrogen, collagen, chlorophyll, insulin
d. glycogen, oil, fat, cholesterol

39. Which of the following lists does NOT contain a **polysaccharide**?

a. glucose, starch, chitin
b. sucrose, glucose, collagen
c. glycogen, cellulose, glucose
d. insulin, sucrose, cellulose