WLHS / Biology / Monson

Name_____
Date_____Per_____

STUDY GUIDE: BIOLOGY - Semester 1 Final

Chapter 1: BIOLOGY – THE STUDY OF LIFE

VOCABULARY:

Adaptation	Evolution	Reproduction	Observation	Experiment
Biology	Growth	Response	Control	Hypothesis
Development	Homeostasis	Species	Data	Scientific method
Energy	Organism	Stimulus	Dependent variable	Theory
Environment	Organization		Independent variable	Inference

1) What is **biology**?_____

2) What is a good (i.e. "controlled") experiment?

3) Distinguish between **dependent** and **independent** variables.

> **DEPENDENT**:_____

> **INDEPENDENT**:_____

4) Explain the difference between **qualitative** and **quantitative** data.

> **QUALITATIVE**:_____

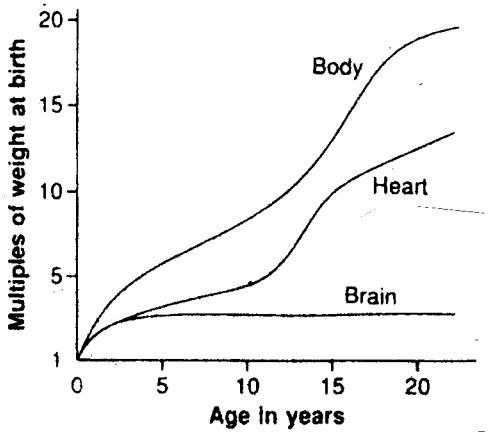
> **QUANTITATIVE**:_____

5) What are the major characteristics of life? (list 6)

6) What makes a good graph?_____

(Be able to read and analyze a graph!)

Use the graph to the right to answer the 4 questions that follow.



7) According to the graph, is the **brain *or* body** the last to reach its full weight?

_____

8) At age 10, how many times has the heart increased in weight?

_____

9) At what age does the body reach 15 times its weight at birth?

_____

10) According to the graph, what is unique about the growth of the brain?

_____

11) Define **HOMEOSTASIS**. Give an example._____

_____

Chapter 2: THE CHEMISTRY OF LIFE
VOCABULARY:

Acid	Element	Molecule	Polar molecule	Nucleic acid
Atom	Ion	pH / pH scale	Amino acid	Polymer
Base	Ionic bond	Solution	Carbohydrate	Protein
Compound	Isotope	Diffusion	Enzyme	Van der Waals
Covalent bond	Mixture	Hydrogen bond	Lipid	Cohesion / adhesion

1) Summarize the characteristics of the 3 subatomic particles: protons, neutrons, and electrons. (Where are they located? What is their charge?

Subatomic particle:	Location in atom:	Charge:
Proton		
Neutron		
Electron		

2) What is the difference between a **covalent bond**, **polar covalent bond**, and an **ionic bond**?

➔ covalent bond:_____

➔ polar covalent bond:_____

➔ ionic bond:_____

3) How many of each type of atom are in $C_6H_{12}O_6$? C:_____ H:_____ O:_____

4) What is **pH**?_____ What makes a solution **acidic** or **basic**?_____

_____

5) What are **monomers** and **polymers**?_____

6) Complete the following chart summarizing the major properties of the 4 biomolecules.

Biomolecule:	Elements:	Monomers:	Major function:	Example:	Where in diet?
Carbohydrates					
Lipids					
Proteins					
Nucleic acids					N/A

*****Be able to identify each of the biomolecules mentioned above***

7) What are enzymes, how do they work, and what factors affect them? (include explanation of SUBSTRATE and ACTIVE SITE)

8) What are the major properties of **WATER**. What makes water unique and suitable for life?

9) Distinguish between **HYDROPHILIC** and **HYDROPHOBIC**.

Chapter 7 and 10: CELLS, CELL TRANSPORT, and CELL DIVISION

VOCABULARY (CH 7)

Cell theory	Light microscope	Selective permeability	Cilia / flagella	Lysosomes / vacuole
Electron microscope	Prokaryote	Transport proteins	Cytoplasm	Microfilament/tubules
Eukaryote	Homeostasis	Cell wall	Cytoskeleton	Mitochondria
Nucleus	Phospholipids	Chlorophyll/chloroplast	Endoplasmic retic.	Nucleolus
Organelle	Plasma membrane	Chromatin/chromosome	Golgi apparatus	Ribosome
Active / passive trans.	Endo / exocytosis	Facilitated diffusion	Hyper / hypo / isotonic	Osmosis

VOCABULARY (CH 10)

Cell cycle	Prophase / metaphase	Interphase (G1, S, G2)
Centriole	Anaphase / telophase	
Centromere	Sister chromatids	
Cytokinesis	Spindle fiber	
Mitosis	cancer	

1) Distinguish between prokaryotic and eukaryotic cells.

> **PROKARYOTES**:_____

> **EUKARYOTES**:_____

2) Describe 3 ways in which plant cells and animal cells differ.

_____ _____ _____

3) List the function of the following cell parts and ***know what they look like in a cell***:

• nucleus:_____ • cytoskeleton:_____

• mitochondria:_____ • chloroplast:_____

• endoplasmic reticulum:_____ • Golgi apparatus:_____

• ribosomes:_____ • chromosomes:_____

• lysosomes:_____ • vacuole:_____

4) Distinguish between passive transport and active transport. Give an example of each.

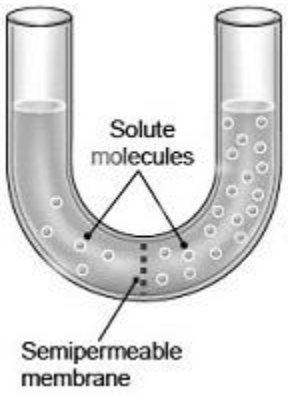
> **PASSIVE TRANSPORT**:_____

> **ACTIVE TRANSPORT**:_____

5) Describe the structure and function of the plasma (cell) membrane. You may include a labeled sketch.

6) What is the difference between **DIFFUSION** and **OSMOSIS**? Explain what moves in each and why.

7) In the set up shown here, identify which way water will move. **Explain your answer.**
**use the words "hypertonic" and "hypotonic" in your answer!



8) List and briefly describe the stages of the **CELL CYCLE**:

Interphase

> _____ :

> _____ :

> _____ :

> _____ :

> _____ :

9) List and briefly describe the stages of **mitosis** (what happens in each stage?).
*****Be able to recognize a picture of a cell in each of the phases.***

> _____ :

> _____ :

> _____ :

> _____ :

10) Sketch a cell in each of the phases of the cell cycle. Assume it has 3 chromosomes.

Interphase	Prophase	Metaphase	Anaphase	Telophase	Cytokinesis

11) What is cancer? How is it related to the cell cycle?_____

_____

Chapter 12 & 13: DNA & PROTEIN SYNTHESIS:

VOCABULARY (CH 12-13)

DNA replication	Transfer RNA	Mutagen
Double helix	Transcription	Point mutation
Codon	Translation	Insertion
Messenger RNA	Chromosomal mutation	Deletion
Ribosomal RNA	Frameshift mutation	Substitution

*****Be able to Identify all scientists that were involved in discovering DNA, how it was passed on genetic information from one generation to another , and the experiments these scientists conducted***

1) What are the monomers (subunits) of DNA (and RNA) called?_____

2) Sketch one of these monomers and label the 3 parts.
(assume it is a monomer of DNA in terms of labeling the sugar)

3) What is a chromosome?_____When in a cell's cycle are the chromosomes visible?_____

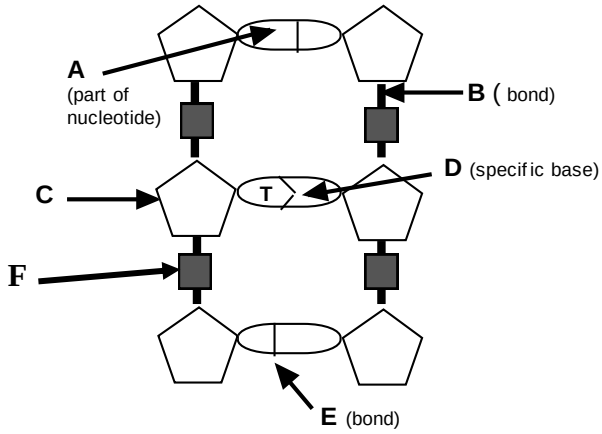
4) What are the proteins around which chromatin coils to form a chromosome?_____

5) List 3 ways in which DNA and RNA differ.

_____ _____ _____

6) Using the diagram, identify the parts of a DNA molecule.

*****circle what would be considered one nucleotide!***



7) Where does DNA replication occur?_____

8) Where does transcription occur?_____

9) What is the product of transcription?_____

10) Where does translation occur?_____

11) What is the product of translation?_____

12) What are the "base pairing rules"?_____

13) What holds the DNA strands together?_____

14) What is a **CODON**?_____

15) What is an **ANTICODON**?_____

16) The following is the base sequence on one strand (original) of a DNA molecule:

A A T G C C A G T G G T T C G C A C A C T

a) Write the base sequence of the complementary DNA strand._____

b) Write the base sequence of the strand of mRNA transcribed from the original DNA strand.

_____

c) What protein fragment (amino acid sequence) would this mRNA code for?

_____

17) What is a frameshift mutation? What effect does it have on a protein?

18) What are **MUTAGENS**? List two types or examples of mutagens.

Chapter 15 (& 14.3): BIOTECHNOLOGY:

VOCABULARY (CH 15, and 14.3)

Clone	Plasmid	Transgenic organism
Gene splicing	Recombinant DNA	Vector / host cell
Genetic engineering	Restriction enzyme	Gene therapy
Sticky ends	Biotechnology	

1) What is **recombinant DNA**?_____

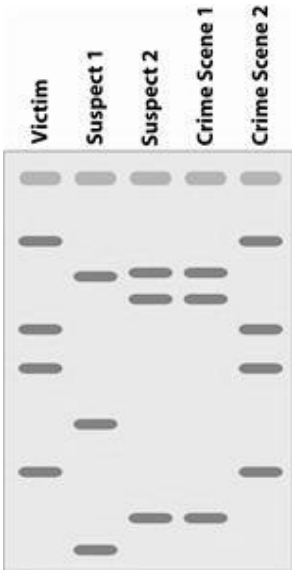
2) Describe the **function** of **restriction enzymes**._____

3) Analyze this gel showing DNA fingerprinting results from a crime scene.

A) Whose blood is represented by "crime scene 2"?

_____

B) Which suspect is guilty?_____



4) How does gel electrophoresis work? (how do molecules move? which size molecules move faster / slower?)

5) List 2 uses for DNA technology in each of the following areas:

HEALTH & MEDICINE: **AGRICULTURE & INDUSTRY:** **FORENSICS / I.D.:**