RTC Medical Preparatory High School

Honors Biology

***Final Exam Topic List—1st Semester***

***General Information:*** The final exam will be given on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It will consist

of 100+ multiple choice or matching questions, on topics from Chapters 1, part of 2, and 7-9. Questions will require students to ***know and apply*** ***information*** about the topics listed below. Some questions may require students to interpret a diagram or graph and relate it to specific topics that have been studied in order to select the best answer. Additional questions may require students to interpret given laboratory data. Students are also expected to ***know the vocabulary from each chapter***, as these terms will be used within questions.

***Directions:*** Take notes for each topic in the space provided below…this may include a written description or a labeled picture. Pretend that the topics listed are questions. For example, the first topic listed is really asking you…what is the study of biology?

***Chapter 1***

1. What is the study of Biology
2. List and describe the Properties of Life
3. The relationship between the following terms:
   1. species & reproduction
   2. growth & development
   3. stimulus & response
   4. adaptation & evolution
4. Parts of a well designed, controlled experiment:
   1. Hypothesis
   2. Control group
   3. Experimental group
   4. Controlled zariables (constants)
   5. Independent variable
   6. Dependent variable
5. The relationship between a hypothesis ad a theory
6. Qualitative and Quantitative Data

***Chapter 2: Chemistry of Life***

1. Basic structure of an atom—nucleus (protons & neutrons) and electrons in energy
2. levels
3. Acids and bases – their definitions and relation to the pH scale
4. The terms polar, nonpolar, hydrophilic, and hydrophobic?
5. What each of the following is made up of?
   1. Carbohydrates
   2. Proteins
   3. Nucleic Acids
6. Gene Expression
   1. Transcription
      1. What is this
      2. Where does it happen
   2. Translation
      1. What is this
      2. Where does it happen
   3. What is a codon
   4. Bea able to read mRNA to determine amino acid sequences
7. The function of enzymes/catalysts and how they work
8. Activation Energy
9. Factors that affect enzyme activity
10. The lock and key nature of enzyme-substrate complexes

**Chapter 7: Cell Structure**

1. Contributions of van Leewenhoek, Hooke, Schleiden, Schwann and Virchow to understanding the basic nature of cells
2. Parts of the Cell Theory
3. Similarities and Differences between prokaryotic and eukaryotic cells
4. Understand how and why the plasma membrane is selectively permeable, and what this means
5. Functions of the four types of membrane proteins
6. Structure of and major parts of the plasma membrane, including phospholipids, cholesterol, membrane proteins, and hydrophilic/hydrophobic areas (pages 81/84 of text)
7. The function and structure of the following cell structures…be able to identify them on a diagram:
   1. Cell wall
   2. Centrioles
   3. Chloroplast
   4. Chromatin
   5. Endoplasmic reticulum
   6. Golgi apparatus
   7. Mitochondrion
   8. Nucleus
   9. Nucleolus
   10. Plasma membrane
   11. Ribosome
   12. Central Vacuole
   13. Cytoplasm
   14. Cytoskeleton
   15. lysosome
   16. cilia
   17. flagella
8. Differences between plant and animal cells
9. *Passive Transport:*
10. Diffusion:
    1. Concentration gradients
11. Relationship between diffusion and osmosis
12. How a concentration gradient determines the direction of osmosis:
    1. Isotonic solution
    2. Hypertonic solution
    3. Hypotonic solution
13. Facilitated diffusion (ion channels)
14. *Active Transport:*
15. Carrier proteins (membrane pumps)
16. Endocytosis (pinocytosis and phagocytosis)
17. Exocystosis

***Chapter 8 & 9:Photosynthesis and Cellular Respiration***

1. The relationship between the sun and food chains
2. Be able to draw a food chain and a food web?
3. 5. What are 1st order consumers, 2nd order consumers, and 3rd order consumers?
4. 7. How much energy is passed along to each step in a food chain? How much is lost as heat?
5. Structure of ATP
6. Show the formation and break down of ATP
7. Structure of a chloroplast: stroma, grana, thylakoid membranes, chlorophyll
8. *Photosynthesis:*
9. Light dependent reactions, electron transport chain (ETC)
   1. Location of electron transport chain
   2. Function of the ETC
   3. Function of ATP synthetase
10. Light independent reactions, Calvin cycle
    1. Why they are called the dark reactions
    2. Location of the dark reactions
    3. Reactants and products of the Calvin cycle
11. General equation of photosynthesis
12. *Cellular respiration:*
13. Glycolysis…where does it occur, what does it break down, what are the resulting products
14. Structure of a mitochondria
15. Location of the Krebs cycle
16. Reactants and products of the Krebs cycle
17. The location of electron transport chains in cellular respiration
18. The role of oxygen in electron transport chains
19. Anaerobic vs. aerobic respiration
20. Identify whether the following are aerobic or anaerobic:
    1. Glycolysis, Krebs cycle, electron transport chain, fermentation
21. The relationship between fermentation and glycolysis
22. Differences between the two types of fermentation
23. General equation for aerobic cellular respiration
24. Amount of net ATP acquired from each part of respiration:
    1. Aerobic respiration
       1. Glycolysis
       2. Krebs Cycle
       3. ETC
    2. Fermentation
25. General comparison of photosynthesis and cellular respiration