***BIOLOGY 1 – MIDTERM EXAM REVIEW***

**Chapter 1 Biology: The Study of Life**

1. List and explain each of the characteristics of life.

1)

2)

3)

4)

5)

1. Define the following terms:

Stimulus

Response

Homeostasis

Adaptation

1. Identify and explain the steps of the Scientific Method (page 17)

1)

2)

3)

4)

5)

6)

7)

1. What is the control in an experiment?
2. Explain the difference between a scientific theory and a scientific law.
3. When would a scientist collect quantitative data?
4. When would a scientist collect quantitative data?
5. How to ethics relate to science?
6. What is technology?

**Chapter 6: The Chemistry of Life**

1. List and give the charge of the three particles that make up an atom.
2. What particles are found in the nucleus
3. Where are electrons found?
4. Draw a Bohr diagram for a fluorine atom. Atomic number = 9; Atomic mass = 19
5. What is an isotope? Give an example
6. Explain the difference between an ionic bond and a covalent bond.
7. Define organic compounds.
8. What is the atomic number of an atom?
9. How do enzymes affect reactions in living organisms?
10. What is meant by pH? Give an example of an acid and a base and tell their pH number.
11. Draw a water molecule and explain why it is a polar molecule.
12. List the four biomolecules and the elements that make them up.

1)

2)

3)

4)

1. What is the difference between dehydration synthesis and hydrolysis?
2. What are the subunits for each of the biomolecules?
3. Carbohydrates
4. Lipids
5. Proteins
6. Nucleic acids
7. List three functions of proteins.

1)

2)

3)

**Chapter 7 - A Tour of a Cell**

1. What are the three statements of the cell theory?

1)

2)

3)

26. How do you calculate the magnification of a microscope?

1. What is the difference between an eyepiece and an objective on a microscope?
2. List the levels or organization of living things from small to large.
3. What is the difference between eukaryotes and prokaryotes?
4. What group of organisms do not have cell walls?
5. Know the function of each of the following eukaryotic organelles.
6. Nucleus
7. Endoplasmic reticulum (rough and smooth)
8. Golgi apparatus
9. Mitochondria
10. Chloroplast
11. Plasma membrane
12. Lysosome

**Chapter 8 - Cell Transport and the Cell Cycle and 10.2 Meiosis**

1. What is meant by dynamic equilibrium?
2. Explain the difference between diffusion, osmosis, and facilitated diffusion.
3. Diffusion
4. Osmosis
5. Facilitated Diffusion
6. What happens to a cell in a hypotonic solution?
7. What happens to a cell in a hypertonic solution?
8. What happens to a cell in a strong sugar solution?
9. What is the main thing that limits the size of cells?
10. Reproduce the Cell Cycle diagram on page 206. Pay particular attention to what is the longest phase of the the cell cycle and what is the longest phase of mitosis.
11. Know what happens in each of the phases of mitosis. Use page 207.

Prophase

Metaphase

Anaphase

Telophase

1. What is cytokinesis?
2. What happens during interphase?
3. Compare mitosis and meiosis: **Mitosis** **Meiosis**

Types of cells produced (body or gametes)

Produces (haploid of diploid cells)

Number of divisions

Number of cells produced

New cells are (same or different)

1. What are sister chromatids?
2. What does the spindle do?
3. How is meiosis 1 different from mitosis?
4. What is the normal chromosome number for a human body cell? What is the chromosome number for a human gamete (egg/sperm)?.

**Chapter 9 - Energy in the Cell**

1. Explain the ADP – ATP cycle.
2. What is the equation for photosynthesis?
3. What is chlorophyll and where is it found?
4. What are the products of the Light Dependent Reactions?
5. What is the purpose of the Calvin Cycle?
6. What is the equation for cellular respiration?
7. Why is oxygen necessary to produce energy in a cell?
8. What are the two types of fermentation?
9. Which type of fermentation is used in the production of bread?
10. Which type of fermentation results in the buildup of lactic acid in muscles?
11. What is the relationship between photosynthesis and cellular respiration?

**Chapter 11 DNA and Genes**

1. What is a nucleotide?
2. Draw a DNA molecule showing the sugar, phosphate groups, and 5 pairs of nitrogenous bases.
3. What is the complimentary strand to DNA sequence: ATTCATGCGACA
4. What is the process of replication and where does it occur in the cell?
5. What are the differences between DNA and RNA?
6. Describe the process of transcription and where does it occur in the cell.
7. What is mRNA?
8. What is tRNA?
9. Describe the process of translation and where does it happen in the cell. Refer to page 294 in your textbook.
10. What is a point mutation?
11. What is a frameshift mutation? Refer to page 298 in your textbook?
12. Review types of chromosomal mutations on page 300.
13. Who were Watson and Crick?

**Chapter 10.1 Mendel and Meiosis**

1. Define dominant and recessive genes.
2. Is gene pair Bb homozygous or heterozygous?
3. What are alleles?
4. Do a Punnett square showing the cross of a Brown mouse BB and a white mouse bb.
5. What is the difference between phenotype and genotype?
6. Explain Mendel’s Law of Segregation.
7. Explain Mendel’s Law of Independent Assortment.
8. What are the genotypes for the human blood types: A, B, AB, and O
9. Using a Punnett square, show the cross between a woman who is heterozygous for type B blood and a man who is heterozygous for type A blood.
10. What is meant by multiple alleles? Give an example of a trait controlled by multiple alleles.
11. What is codominance? Give an example of a trait that shows codominance.
12. What is incomplete dominance? Give an example.
13. What is a sex-linked trait?
14. Draw a Punnett square showing the cross of female fruit fly heterozygous for red eyes (XRXr) and a white-eyed male (XrY).
15. What is PKU?
16. Why are more males colorblind than females?
17. What is sickle-cell disease? What is the relationship between sickle-cell disease and malaria?