Bio I
EOC Review #2: Cell Origins, Structure, and Transport

Cell Origins

1. Explain spontaneous generation. How are Francesco Redi and Louis Pasteur associated with this term? (pg. 388-389).
2. What two developments must precede life on Earth? (pg. 390)
3. How did the following individuals contribute to the theories of the origins of life: Alexander Oparin, Stanley Miller and Harold Urey. (pg. 390)

4. Explain the Endosymbiont theory. Who proposed this theory? (pgs. 392-393)
   - pg. 397 - Answer the multiple choice questions for review #3,4,9,10

ANSWERS: b,c,b,b

The Cell Theory

1. Explain how the following individuals contributed to the discovery of the cell and the Cell Theory: Robert Hooke, Anton von Leeuwenhoek, Matthias Schleiden, Theodore Schwann, and Rudolf Virchow. (pg 171)
2. What are the components of the cell theory. (pg.172)
3. What is the difference between a prokaryotic cell and a eukaryotic cell? Give examples of both. (pg. 173)

Plasma Membrane

1. What is the function of the plasma membrane? (pg. 175)
2. Relate the following words: homeostasis and selective permeability. (pg. 175)
3. The plasma membrane contains several components. These include proteins, cholesterol, and carbohydrate chains. Explain the function of each. (pg. 176)
4. Diagram a plasma membrane using the components listed above.
5. Why is the plasma membrane called the fluid mosaic model? (pg. 178)

Cell Structure

1. The cell is made up of organelles. These include the following: nucleolus, nucleus, ribosome, rough ER, smooth ER, Golgi apparatus, mitochondria, lysosome, vacuoles, cytoskeleton, and cytoplasm. What is the function of each of these organelles? (pgs. 179)
2. Which of these organelles can be found in prokaryotic organisms?
3. In working with plant and animal cells, you accidentally mixed up the slides. What are three differences between plant and animal cells that could help you with this problem? Explain the function of each of these organelles.
4. Explain the relationship between the rough ER, nucleolus, Golgi complex and ribosomes. Be sure to include the following terms: translation, mRNA, transcription, rRNA, DNA, tRNA (pg 180)

5. Several organelles such as mitochondria and endoplasmic reticulum are made up of highly folded membranes. Explain the benefits of this arrangement.
6. Ribosomes are organelles that are found in both prokaryotic and eukaryotic organisms. What type of membrane must a ribosome have to make this statement true?
7. Plants, bacteria, and fungi are examples of organisms that possess a cell wall. How are they different? Hint: Think about the contents.
   - pg. 192 - Understanding Main Ideas #6-13

ANSWERS: c,c,d,b,c,c,a,c

   - pg. 193 – End-of-Course Test Practice #21-27

ANSWERS: d,a,c,d,c,b,a

Cellular Transport

1. What is the difference between passive and active transport? (pg. 198)

- Four examples of passive transport are diffusion, osmosis, channel proteins, and carrier proteins.

2. What is the difference between diffusion and osmosis? (pg. 195)
3. Osmosis can affect cells in three different ways depending on their environments: isotonic, hypotonic and hypertonic. What is the difference between these three solutions? (pg. 196)
4. What is the difference between a channel and carrier protein? (pg. 198)
5. Two examples of active transport are endocytosis (pinocytosis and phagocytosis) and exocytosis. What is the difference between these two forms of transport? (pg. 200)

6. If you were to dissolve some sugar in a liter of water and then place some of this solution into a dialysis bag; then place the bag into a beaker of distilled water, what would happen to the size and weight of the bag of sugar water?

Mitosis

1. Describe the following terms: chromatin, chromosome, centromere, sister chromatids, tetrad, homologous chromosome. (pg. 203)
2. Explain in detail the phases of mitosis. Include all appropriate terms. (pg. 204)
3. Are the cells produced in mitosis haploid or diploid? Explain.
4. What is the difference between the following: cytokinesis, interphase, and mitosis
   - pg. 218 - Understanding Main Ideas #6-13

     ANSWERS: b,b,c,d,d,d,b,d
   - pg. 219 – End-of-Course Test Practice #19-26

     ANSWERS: b,a,c,d,a,b,d,b

Cellular Respiration

1. What is the difference between ATP and ADP? Be sure to not only include the function but also structural differences. (pg. 227-228)
2. How is energy released in ATP? How is energy gained in ADP? (pg. 229)

- There are three stages of cellular respiration: glycolysis, Kreb cycle (citric acid cycle), and the electron transport chain.

3. What is the difference between anaerobic and aerobic respiration? Which of the stages listed above are anaerobic and which aerobic? (pg. 237)
4. Briefly summarize glycolysis. Be sure to include the following terms: pyruvate, $C_6H_{12}O_6$. Where does this process occur in the cell? (pg. 237)
5. The fate of pyruvate depends of the type of organism: simple vs. complex. Explain.
6. What are two examples of fermentation? Be sure to include what types of organisms utilize which process and the products of both reactions. Is fermentation anaerobic or aerobic? (pg. 241-242)
7. Complex organisms can undergo the process of lactic acid fermentation. Explain. (pg. 242)
8. Review the pre-Kreb and Kreb cycle (citric acid cycle). (pg. 238-239)
9. Where does the pre-Kreb and Kreb cycle occur in the cell? Are they anerobic or aerobic? (pg. 242)
10. Cellular respiration is the process of breaking down glucose to obtain energy. What happens to the six carbons in glucose in this process?
11. What occurs in the electron transport chain? Where does this process occur within the cell?
12. Why is oxygen so important to the electron transport chain? (pg. 240)

Photosynthesis

1. Explain the structure of a chloroplast. Be sure to include the following terms: grana, thylakoid, stroma. (pg. 190)
2. Briefly explain the light-dependent reaction of photosynthesis. Be sure to include the following terms: chlorophyll, photolysis. Where does this process occur in the plant cell? (pg. 232-234)
3. Briefly explain the light-independent reaction (Calvin cycle)? Where does this occur in the plant cell? (pg. 234-236)
4. How many molecules of carbon dioxide are required in the Calvin cycle to produce one structure of glucose? (pg. 236)
5. What is the relationship between photosynthesis and cellular respiration? (pg. 243)

- pg. 247 - Understand Main Ideas #1-10

  ANSWERS: b,b,c,a,d,d,b,b,a,a
- pg. 249 - Assessing Knowledge & Skills #1-3

  ANSWERS: c,d,a
- pg. 250-255 - Biodigest: Read and answer the Biodigest Assessment multiple choice questions #1-10

  ANSWERS: b,c,a,c,d,d,a,c,c,a