Bio I
EOC Review #3: Cellular Respiration, Photosynthesis, and Molecular Biology

Cellular Respiration

1. What is the difference between ATP and ADP? Be sure to not only include the function but also structural differences. (pg. 222)
2. How is energy released in ATP? How is energy gained in ADP? (pg. 223)

- 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. 231)
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. 231)
5. 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. 235)
6. Complex organisms can undergo the process of lactic acid fermentation. Explain. (pg. 235)
7. Review the pre-Kreb and Kreb cycle (citric acid cycle). (pg. 232)
8. Where does the pre-Kreb and Kreb cycle occur in the cell? Are they anerobic or aerobic? (pg. 232)
9. Cellular respiration is the process of breaking down glucose to obtain energy. What happens to the six carbons in glucose in this process?
10. Why is oxygen so important to the electron transport chain? (pg. 234)

Photosynthesis

1. Explain the structure of a chloroplast. Be sure to include the following terms: grana, thylakoid, stroma. (pg. 184)
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. 226)
3. How many molecules of carbon dioxide are required in the Calvin cycle to produce one structure of glucose? (pg. 228)
4. What is the relationship between photosynthesis and cellular respiration? (pg. 237)

- pg. 242 - Understand Key Concepts #1-13
  ANSWERS: Calvin cycle, aerobic, NADP+, Calvin cycle, photosynthesis, b,b,a,d,d,b,d,a
- pg. 243 – End-of-Course Test Practice #20-23
  ANSWERS: d,a,c,d
- pg. 244-249 - Biodigest: Read and answer the Biodigest Assessment multiple choice questions #1-17
  ANSWERS: b,d,c,c,a,c,c,a,d,c,a,a,c,c,c,b,b

DNA and DNA Replication

1. What are the three basic components of DNA? (pg. 282)
2. What are the four nitrogenous bases? Explain base pairing. (pg. 282)
3. Describe DNA configuration. Include following terms: components of the backbone, components of the rungs, and complementary base pairing. Who is responsible for its description? (pg. 283)
4. Explain the process of DNA replication. (pg. 284)
   - pg. 306 – Understanding Key Concepts #6-8,1
     ANSWERS: c,a,c

Mitosis

1. Describe the following terms: chromatin, chromosome, centromere, sister chromatids, tetrad, homologous chromosome. (pg. 204)
2. Explain in detail the phases of mitosis. Include all appropriate terms. (pg. 204-209)
3. Are the cells produced in mitosis haploid or diploid? Explain.
   - pg. 218 - Understanding Key Concepts #9-13
     ANSWERS: d,d,d,b,d
   - pg. 219 – End-of-Course Test Practice #19-26
     ANSWERS: b,a,c,d,a,b,d,b

Meiosis

1. What is the purpose of meiosis? (pg. 265)
2. Describe briefly the phases of meiosis? Label each stage as being haploid or diploid. (pg. 266-269)
3. What is crossing over? Explain why this occurs? (pg. 266)

4. What is the difference between meiosis and mitosis?
5. Explain nondisjunction. Provide some examples of nondisjunction. (pg. 271)
   - pg. 278 – Chapter 10 Assessment - #1-6, 9,10
     ANSWERS: zygote, homozygous, alleles, nondisjunction, gametes, d,c,a
   - pg. 279 – End-of-Course Test Practice - #25-28
     ANSWERS: c,a,d,c

Protein Synthesis

1. List and explain three ways in which RNA is different from DNA. (pg. 288)
2. What are the three types of RNA? What is the difference between them? (pg. 290)
3. Explain the process of transcription. Be sure to include the appropriate terms. Where does it occur? (pg. 290)
4. Explain the process of translation. Be sure to include the appropriate terms. Where does it occur? (pg. 293)
5. What is the difference between a codon and an anticodon? (pg. 292 and 295)
6. Fill in the chart with the appropriate information:

DNA Sequence	Process	MRNA codon	Process	tRNA anticodon	Amino Acid
AAT					
GGG					
ATA					
AAA					
GTT					

Amino acid chart is on pg. 292

- pg. 306 – Understanding Key Concept #9-13
  ANSWERS: d,c,d,a,a
- pg. 307 – End-of-Course Test Practice #20-24
  ANSWERS: d,c,a,c,c

Biotechnology

1. Explain the process of making recombinant DNA. Be sure to include the following terms: restriction enzymes, palindrome and any other appropriate terms. (pg. 341)
2. What is a vector? Provide some examples of vectors. What is the difference between these vectors? (pg. 343)
3. Explain the process of gel electrophoresis. Be sure to use the appropriate terms. (pg. 346)

- pg. 358 - Understand Key Concepts #6-10
  ANSWERS: c,b,d,a,b
- pg. 359 – End-of-Course Test Practice #17-19
  ANSWERS: c,b,d