

Name: \_\_\_\_\_

Biochemistry  
Final Hour Exam

1. (10 points) In a prokaryotic cell what are the signals built into the DNA sequence that tell where a piece of mRNA should begin and where it should end?

2. (20 points) In a eukaryotic cell the final mRNA that is translated on the ribosome is different than the mRNA that was actually transcribed from DNA. Describe the various modifications to the mRNA that have occurred, what purpose these modification may have, and what enzymes or ribozymes were responsible for making these changes.

3. (10 points) In the following piece of DNA point out all initiation codons, termination codons, Met codons and open reading frames.

CUAUGGCUCCGCAUGACAAAUAAAACUCGCGUAUGAGGGA.....

4. (10 points) In the genetic code same codon is used for an initiation methionine and an internal methionine. How does the protein synthesis machinery differentiate between these two codons?

5. (20 points) Compare and contrast the signals and the process involved in targeting a protein to either the inner matrix of a mitochondria or the inner matrix of the nucleus.

6. (15 points) Describe, in as much detail as possible, the regulation of the lac operon in *E. coli*.

7. (15 points) In the eukaryotic cell, genes are generally turned off until some cellular signal turns a gene on for expression. Many steps must occur in this process. What are these steps (in the correct order), what are the general names for the proteins involved in these steps, and what interactions occur between these proteins during this process.