Transcription and Translation

1. Transcribe the *template* DNA segment, 5' GCATCAGTC 3', into an mRNA segment.

2. Choose the *template* DNA sequences required to code for the amino acids *N-term* tyr-gln-his-val *C-term* (tyrosine-glutamine-histidine valine).
   a. 5'AAC GTG ATG ATA3'
   b. 5'GAC ATC GTG GTA3'
   c. 5'TAC TAG TTG TTA3'
   d. 5'ATA CAG ATG CAC3'
   e. 5'AAC ATG TTG GTA3'

3. If the genetic code used two bases or letters to form a codon or word, how many codons could be obtained?
   a. 2
   b. 4
   c. 8
   d. 16
   e. 64

4. The sequence of amino acids in protein synthesis is determined by the sequence of:
   a. Enzymes
   b. Codons
   c. Ribosomes
   d. Polysaccharides

5. Determine the correct sequence from the 5 statements below:
   a. mRNA attaches to a ribosome
   b. The amino acids are joined together by an enzyme
   c. Translation of mRNA by tRNA
   d. mRNA is transcribed for DNA

The correct sequence for protein synthesis is:
   a. d-c-a-b
   b. d-a-b-c
   c. c-a-d-b
   d. c-d-a-b
   e. d-a-c-b

6. When mRNA is synthesized on a DNA template it is known as:
   a. Translation
   b. Conjugation
   c. Transfer
   d. Transcription

7. Translation is the synthesis of:

a. RNA on a DNA template
b. Protein using mRNA as a guide
c. DNA on a DNA template
d. Ribosomal protein using tRNA

8. The ribonucleotide triplet "ACC" is said to "code for the amino acid threonine." This means that
   a. The ribonucleosides, adenosine and cytidine, are required for the biosynthesis of threonine
   b. ACC is a shorthand way of writing the covalent structure of threonine
   c. Addition of the trinucleotide ACC to certain cells causes them to produce threonine
   d. The transfer RNA to threonine probably contains the complementary codeword, UUU
   e. When the nucleotides GGT appear together as a codon in a strand of templte DNA, threonine appears in a particular location in the polypeptide for which the DNA is coding.

9. Genes carry information. This information is primarily determined by the:
   a. Base pairing G=C, A=T
   b. Base sequence G-C-A-T, etc.
   c. Base relationships in the coil of the double helix with 10 bases in 34 angstroms
   d. Bases binding with proteins

10. A particular template DNA base sequence is 5'GCTCAGTTCATA3'. What amino acids are coded by this sequence?

11. What does transcription involve?
   a. Attachment of mRNA to a ribosome
   b. Synthesis of RNA on a DNA template
   c. Changing from the genetic code to an amino acid sequence
   d. Movement of mRNA to the cytoplasm

12. What is the function of messenger RNA in proteins synthesis?
   a. Determines which amino acids will add to which tRNA
   b. The formation of ribosomes
   c. Determines sequence of amino acids
   d. Replicates DNA