

# Protein Synthesis Review

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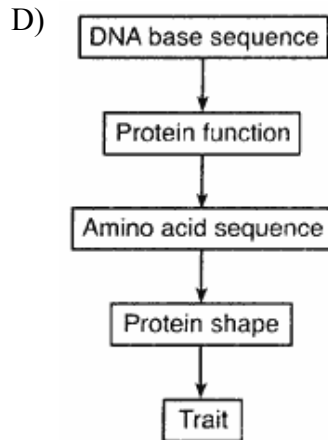
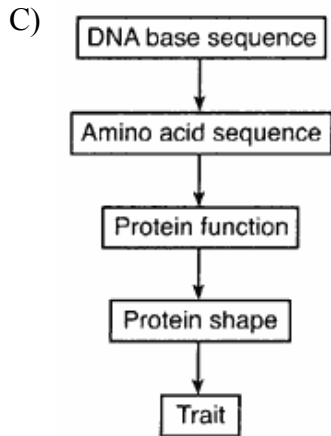
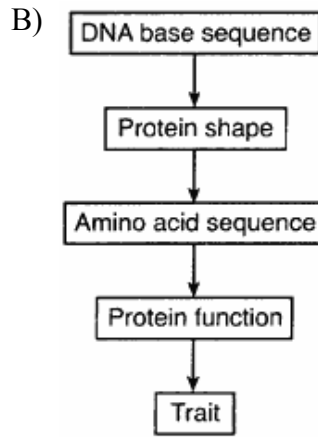
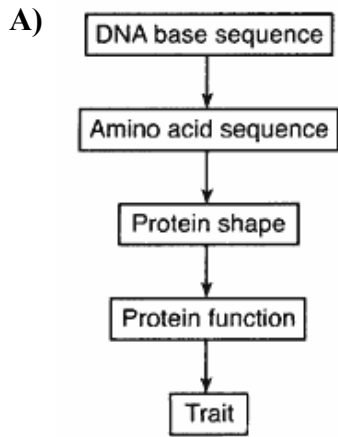
1. The inability of an organism to produce certain proteins can occur when an organism is lacking an enzyme needed to combine

- A) oxygen molecules    B) simple sugars  
C) **amino acids**        D) biological catalysts

2. DNA is able to control cellular activities most directly by regulating the process of

- A) meiotic division    **B) protein synthesis**  
C) active transport    D) selective breeding

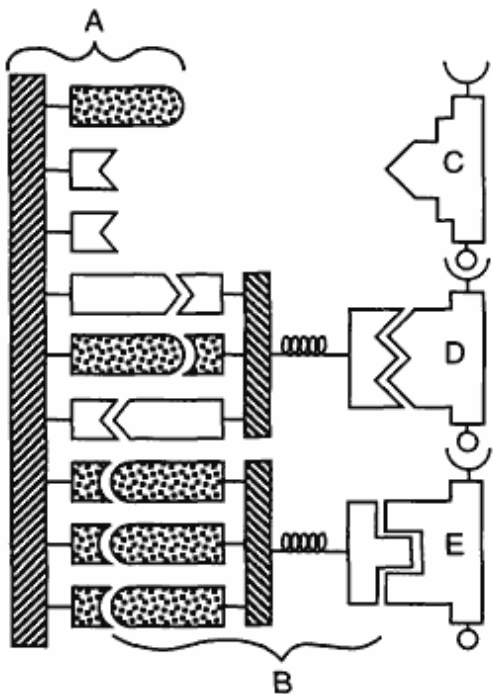
3. Which sequence best represents the relationship between DNA and the traits of an organism?



4. Which statement indicates one difference between the gene that codes for insulin and the gene that codes for testosterone in humans?

- A) The gene for insulin is replicated in vacuoles, while the gene for testosterone is replicated in mitochondria.
- B) The gene for insulin has a different sequence of molecular bases than the gene for testosterone.**
- C) The gene for insulin is turned on in liver cells, but the gene for testosterone is not.
- D) The gene for insulin is a sequence of five different molecular bases while the gene for testosterone is a sequence of only four different molecular bases.

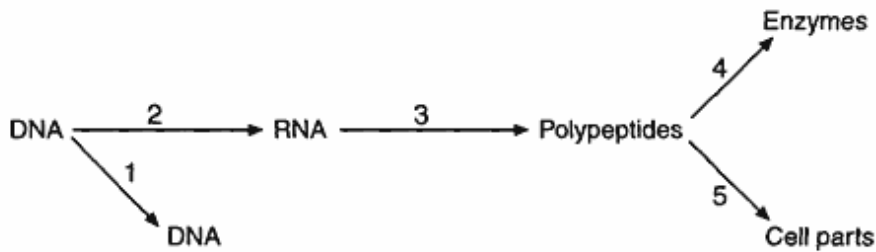
5. Base your answer to the following question on the diagram below, which represents some components involved in cellular protein synthesis, and on your knowledge of Biology.



Molecules *C*, *D*, and *E* will combine to form part of

- A) a polypeptide
- B) a polysaccharide
- C) DNA
- D) RNA

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6. Base your answer to the following question on the diagram below, which contains arrows representing different processes occurring in a cell.



Which processes occur in the nucleus?

- A) 1 and 2      B) 2 and 3      C) 3 and 4      D) 4 and 5
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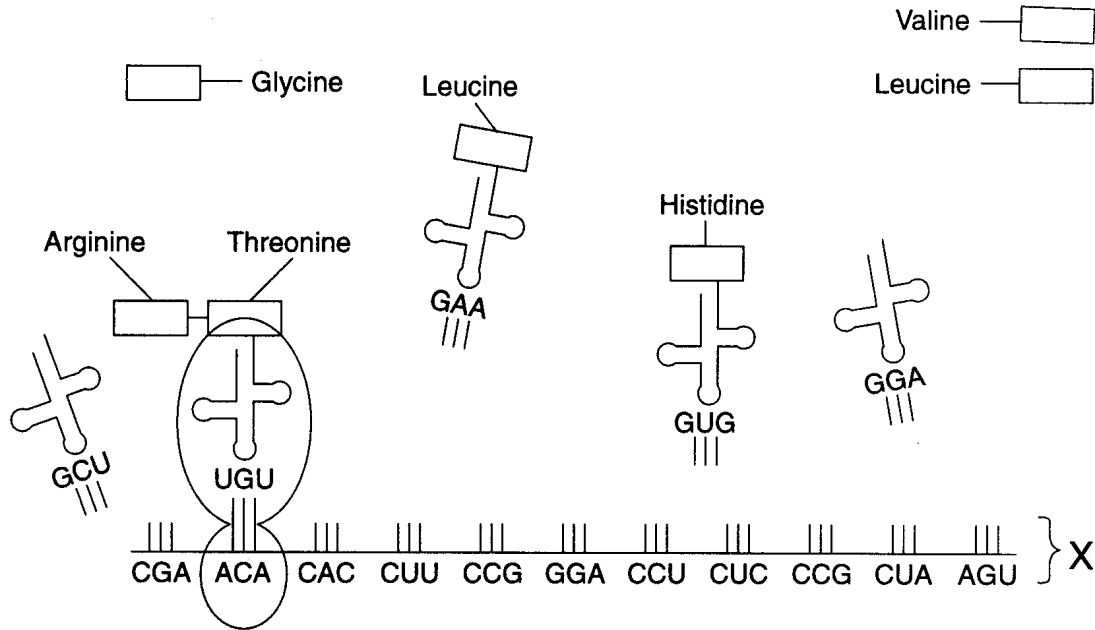
7. Some events that take place during the synthesis of a specific protein are listed below.

- (A) Messenger RNA attaches to a ribosome.
- (B) DNA serves as a template for RNA production.
- (C) Transfer RNA bonds to a specific codon.
- (D) Amino acids are bonded together.
- (E) RNA moves from the nucleus to the cytoplasm.

The correct order of these events is

- A)  **$B \rightarrow E \rightarrow A \rightarrow C \rightarrow D$**
  - B)  $D \rightarrow A \rightarrow E \rightarrow C \rightarrow B$
  - C)  $B \rightarrow C \rightarrow E \rightarrow D \rightarrow A$
  - D)  $C \rightarrow B \rightarrow A \rightarrow E \rightarrow D$
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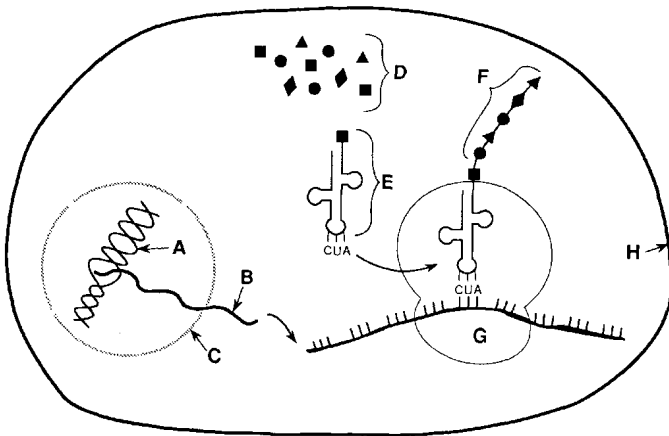
8. Base your answer to the following question on the diagram below of a biochemical process and on your knowledge of biology.



The biochemical process represented in the diagram is most closely associated with the cell organelle is known as the

- A) nucleolus      **B) ribosome**      C) chloroplast      D) mitochondrion

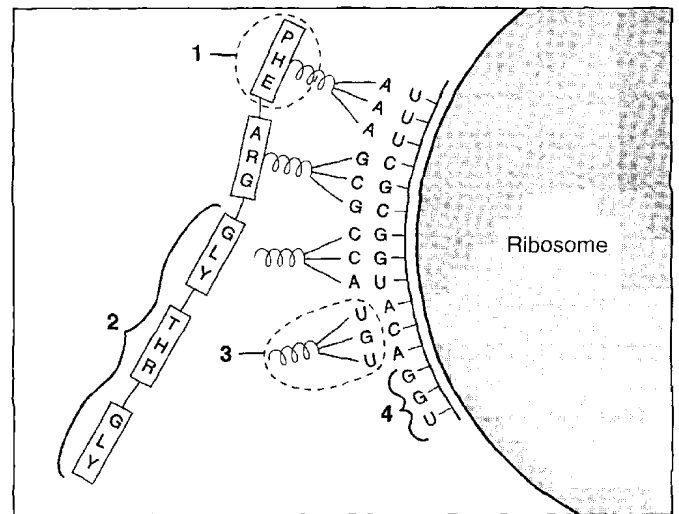
9. Base your answer to the following question on the diagram below which represents protein synthesis within a cell and on your knowledge of biology.



Which letter indicates the site of protein synthesis?

- A) **G**      B) *H*      C) *C*      D) *D*

10. Base your answer to the following question on the diagram below and on your knowledge of biology.



Number 4 represents a

- A) gene      B) nucleotide  
C) **codon**      D) sugar

11. Base your answer to the following question on the chart below and on your knowledge of biology.

**Universal Genetic Code Chart**  
**Messenger RNA and the Amino Acids for Which They Code**

	U	C	A	G	
U	UUU } UUC } PHE UUA } UUG } LEU	UCU } UCC } UCA } SER UCG }	UAU } UAC } TYR UAA } UAG } STOP	UGU } UGC } CYS UGA } STOP UGG } TRP	U C A G
C	CUU } CUC } LEU CUA } CUG }	CCU } CCC } CCA } PRO CCG }	CAU } CAC } HIS CAA } CAG } GLN	CGU } CGC } CGA } ARG CGG }	U C A G
A	AUU } AUC } ILE AUA } AUG } MET or START	ACU } ACC } ACA } THR ACG }	AAU } AAC } ASN AAA } AAG } LYS	AGU } AGC } SER AGA } AGG } ARG	U C A G
G	GUU } GUC } VAL GUA } GUG }	GCU } GCC } GCA } ALA GCG }	GAU } GAC } ASP GAA } GAG } GLU	GGU } GGC } GGA } GLY GGG }	U C A G

Fill in the missing mRNA bases and the amino acid sequence that corresponds to the DNA base sequence below.

DNA            CAC            GTG            GAC            TGA

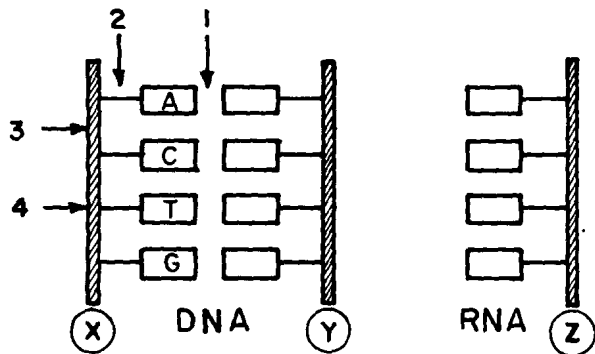
mRNA        \_\_\_\_\_

Amino acids \_\_\_\_\_

12. A small amount of DNA was taken from a fossil of a mammoth found frozen in glacial ice. Genetic technology can be used to produce a large quantity of identical DNA from this mammoth's DNA. In this technology, the original DNA sample is used to

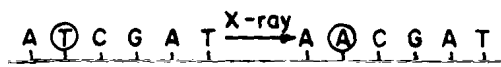
- A) stimulate differentiation in other mammoth cells
- B) provide fragments to replace certain human body chemicals
- C) act as a template for repeated replication**
- D) trigger mitosis to obtain new base sequences

13. Base your answer to the following question on the diagram below which represents parts of two nucleic acid molecules.



At which location does the DNA molecule "unzip" during replication?

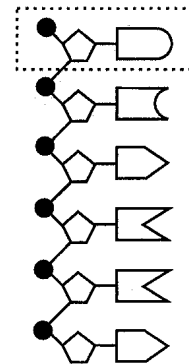
- A) 1    B) 2    C) 3    D) 4
14. Base your answer to the following question on the information below which represents a change in a portion of the base sequence in a DNA molecule.



This change can best be interpreted as

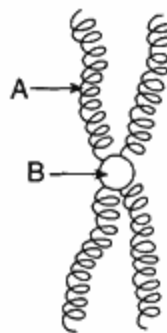
- A) a gene mutation  
 B) nucleic acid replication  
 C) protein synthesis  
 D) gene replication
15. A cell having 26 chromosomes divides to produce two daughter cells, each having 26 chromosomes. The chromosome number of the daughter cells is due most directly to
- A) synapsis and spindle formation  
 B) replication and nondisjunction of chromosomes  
 C) replication and migration of single-stranded chromosomes  
 D) synapsis and crossing-over

16. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents a portion of a strand of a DNA molecule.



The entire structure enclosed within the dotted line represents a

- A) deoxyribose molecule  
 B) nitrogenous base  
 C) phosphate  
 D) nucleotide
17. In a portion of a gene, the nitrogenous base sequence is T-C-G-A-A-T. Which nitrogenous base sequence would normally be found bonded to this section of the gene?
- A) A-C-G-T-A-A    B) A-C-G-U-U-A  
 C) A-G-C-T-T-A    D) U-G-C-A-A-U
18. The diagram below represents a microscopic structure observed during cell division.



Which parts of the structure are indicated by arrows A and B, respectively?

- A) centriole and tetrad  
 B) autosome and allele  
 C) homologous chromosome and spindle fiber  
 D) chromatid and centromere

# Answer Key

## Protein Synth review

1. C

2. B

3. A

4. B

5. A

6. A

7. A

8. B

9. A

10. C

11.

DNA	CAC	GTG	CAC	TGA
mRNA	GUG	CAC	CUG	ACU
Amino acids	VAL	HIS	LEU	THR

12. C

13. A

14. A

15. C

16. D

17. C

18. D