



Name: Key

Per: _____

DNA Replication, Protein Synthesis Test Review
Chapters 12 & 13

1. List the three roles of DNA

- a. Store
- b. transmit
- c. Copy

2. Making a copy of DNA is called DNA replication.

3. The enzyme DNA polymerase is responsible for adding nitrogen bases and proofreading new DNA strands during replication.

4. Where in the cell does the process mentioned in Question 2 occur? nucleus

5. ADENINE pairs with thymine. Cytosine pairs with guanine.

6. Give the complementary DNA strand.

5' ATTGCCAGC 3'

3' TAACGGTCG 5'

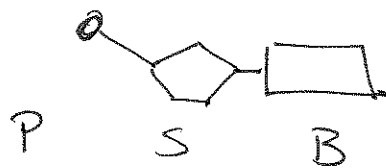
7. Name the nucleic acid that is double stranded and contains deoxyribose sugar. DNA

8. Name the ENZYME responsible for unzipping the DNA strands. DNA helicase

9. Name the three parts of a nucleotide.

- 1. phosphate group
- 2. 5' carbon sugar
- 3. nitrogenous base

10. Draw and label a nucleotide.



11. Describe Chargaff's rule of base pairing.

A with T, C with G

12. Name the type of bond that connects the nitrogen bases of the two DNA strands. Why is this type of bond best to hold the strands together?

H-bonds - weak, but strong in #'s

13. Making a copy of DNA is called DNA replication.

14. Which nitrogen base isn't used during this process? (Process mentioned in #13) Uracil
15. A codon is a group of three nucleotides in mRNA that specifies (determines) ^a ~~an~~ specific (2 words) amino acid to be brought to the ribosome.
16. The enzyme DNA polymerase is responsible for adding nitrogen bases and proofreading new DNA strands during replication, and RNA polymerase is used during transcription.
17. This process of making copying an RNA message from the DNA code is called transcription.
18. Where in the cell does the process mentioned in Question 17 occur? nucleus

19. Use an amino acid chart to tell the amino acid sequence coded for by the following message:

UCAAAAUUC

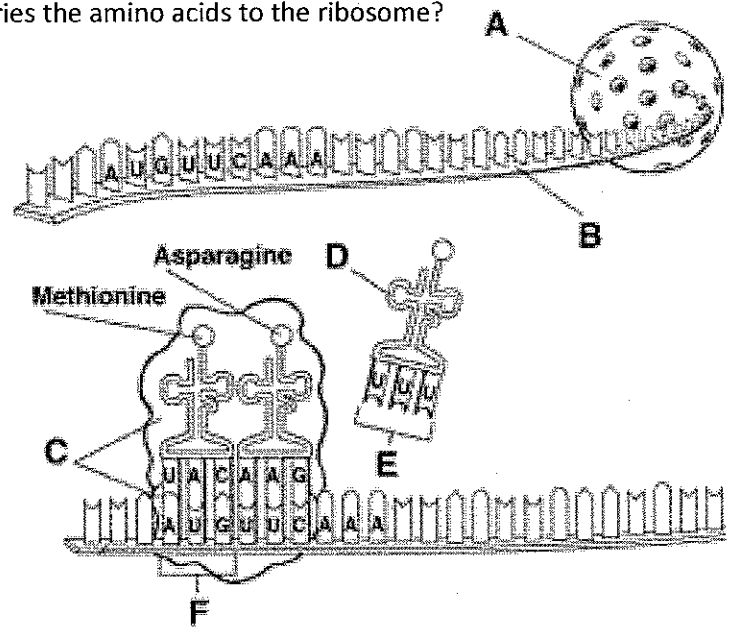
Serine, Lysine, Phenylalanine

20. Which kind of RNA has an ANTICODON region and carries the amino acids to the ribosome?

transfer

21. Label A-F in the diagram to the right.

- a. nucleus
- b. mRNA
- c. ribosome
- d. tRNA
- e. anti codon
- f. codon



22. What process are letters A and B involved in?

transcription

23. What process are letters C-F involved in?

translation

24. Tell three ways DNA is different from RNA.

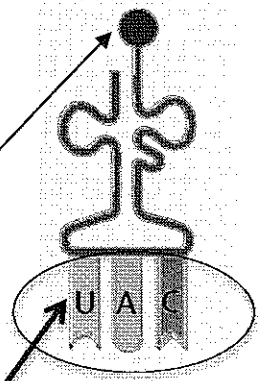
- g. thymine vs. uracil
- h. double strand vs. single strand
- i. deoxyribose vs. ribose

25. Using an RNA message to make a protein is called translation.

26. Give the complementary mRNA strand. ATTGCCAGC UAACGGUCG

27. What kind of RNA is pictured to the right? tRNA

28. Name the molecule attached here. amino acid



29. The three nucleotides attached to this type of RNA is called an anti-codon

30. Name the ENZYME involved in TRANSCRIPTION is RNA polymerase

31. PROTEIN SYNTHESIS could also be called transcription and translation.

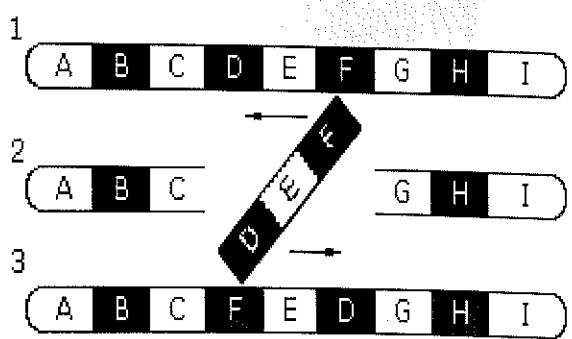
32. Name the type of mutation shown to the right. inversion

33. A mutation that involves moving of genes to a different chromosome. translocation

34. Mutation which involves a single nitrogen base point

35. inversion is a mutation in which the genes on a chromosome turn upside down.

36. A frameshift mutation occurs when the mRNA sequence changes (adding or deleting bases), which causes a change in how the amino acid sequence is translated.



Vocabulary

37. The sequence of three unpaired bases on the bottom of each tRNA molecule. anti-codon

38. Each "three letter word" in mRNA codon

39. RNA molecules that carry copies of instructions for how to assemble amino acids into proteins mRNA

40. Heritable changes in genetic information are mutations

41. Long chains of amino acids joined together as a protein are called polypeptide chains

42. The two subunits that make up proteins are made of this type of RNA ribosomal

43. The enzyme that is required for transcription to occur RNA polymerase

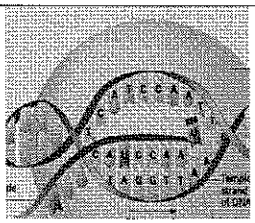
44. Segments of DNA serve as templates to produce complementary RNA molecules in this process gene

45. The type of RNA that transfers each amino acid to the ribosome as it is specified by the coded messages in mRNA transfer

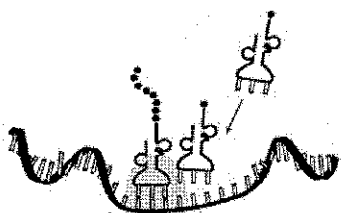
46. The decoding of an mRNA message into a protein is this process translation

47. Circle the correct answer to the following processes:

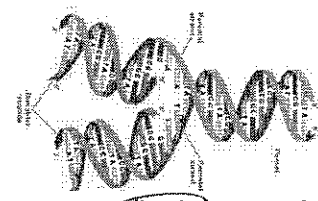
Analogies in Translation! A. ribosome (made of rRNA), B. tRNA, C. mRNA, D. amino acid, E. polypeptide chain (protein)



- Process: replication, transcription, or translation?
- Occurs in (circle one: nucleus, cytoplasm, and/or ribosome).
- The end result is (circle one: 2 identical DNA strands, a protein/polypeptide chain, mRNA)



- Process: replication, transcription, or translation?
- Occurs in (circle one: nucleus, cytoplasm, and/or ribosome).
- The end result is (pick one: 2 identical DNA strands, a protein/polypeptide chain, mRNA)



- Process: replication, transcription, or translation?
- Occurs in (circle one: nucleus, cytoplasm, and/or ribosome).
- The end result is (pick one: 2 identical DNA strands, a protein/polypeptide chain, mRNA)

48. Restaurant worker that gets your food B
 49. The restaurant's drive-thru window A
 50. The food in the kitchen that you ordered D

51. Your food order C
 52. The bag of food (and your drinks) when handed out the window to you E

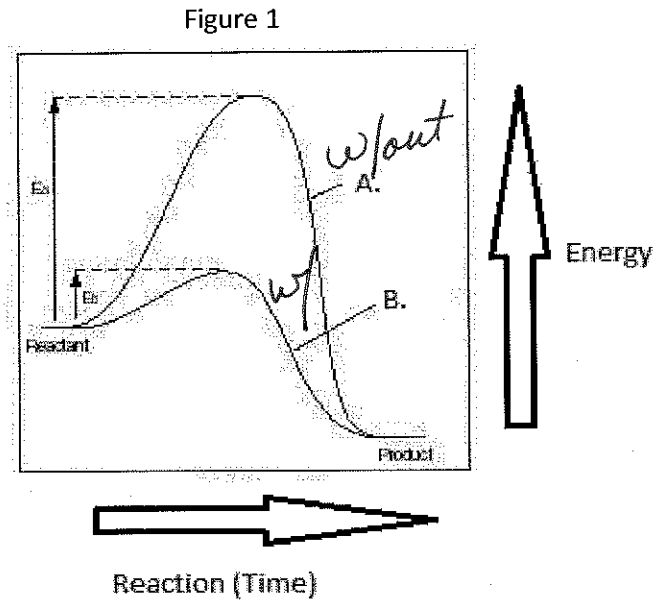
Biochemistry Review

53. Enzymes speed up chemical reactions, and lower activation energy.

54. Explain why enzymes are important to living things.
Speed up reactions to rate necessary for life

55. Using Figure 1 to the right, identify the following: reaction with enzyme, reaction without enzyme, activation energy.

56. What is activation energy?
Amount of energy needed to begin a chemical reaction



57. Complete the following table:

Polymer	Elements	Monomers	Functions
Proteins	CHON	amino acids	1. muscle/bone 4. transport 2. rate of rx 5 fight disease 3. structure
Lipids	CHO	monosaccharides fatty acids	1. store energy 2. chemical messengers 3. membranes
Carbohydrates	CHO	monosaccharides	1. immediate energy 2. structure
Nucleic Acids	CHONP	nucleotides	store, transmit genetic info (instructions to build proteins)