

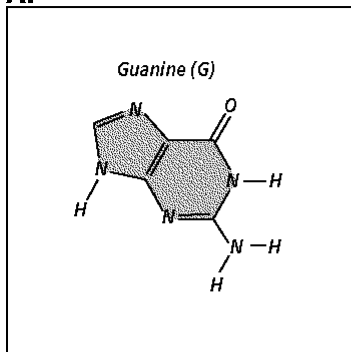
## Bio12-Q2W4,5- Test1-Molecular Genetics

### Multiple Choice

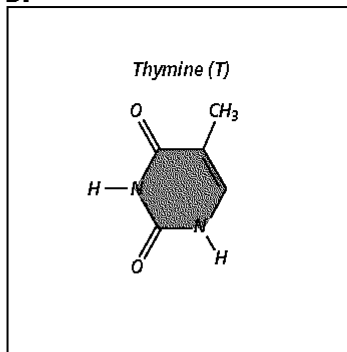
Identify the choice that best completes the statement or answers the question.

- \_\_\_\_ 1. The backbone of a DNA molecule is made of which two components?
- deoxyphosphate molecules and ribose sugars
  - deoxyphosphate molecules and deoxyribose sugars
  - phosphate molecules and ribose sugars
  - phosphate molecules and deoxyribose sugars
- \_\_\_\_ 2. A point mutation is a change in
- several bases in mRNA.
  - several bases in tRNA.
  - several base pairs in DNA.
  - a single base pair in DNA.
- \_\_\_\_ 3. Few chromosome mutations are passed on to the next generation because
- the mature organism is often incapable of producing offspring.
  - the zygote usually dies.
  - the mature organism is sterile.
  - all of the above.
- \_\_\_\_ 4. What is the complementary mRNA sequence to the DNA sequence A-T-T-G-C-A?
- T-A-A-G-C-U
  - T-A-A-C-G-T
  - U-A-A-C-G-T
  - U-A-A-C-G-U
- \_\_\_\_ 5. A mutation in which a single base is added to or deleted from DNA is called
- nondisjunction.
  - translocation.
  - a frame shift mutation.
  - a point mutation.

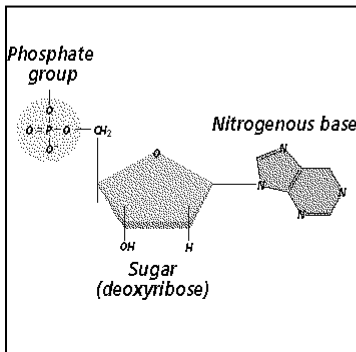
**A.**



**B.**



**C.**



**D.**

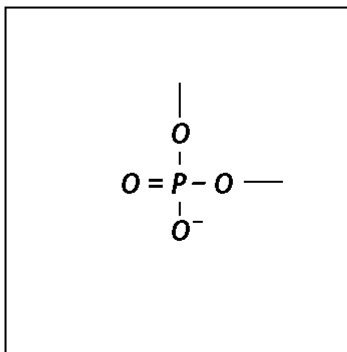


Figure 11-3





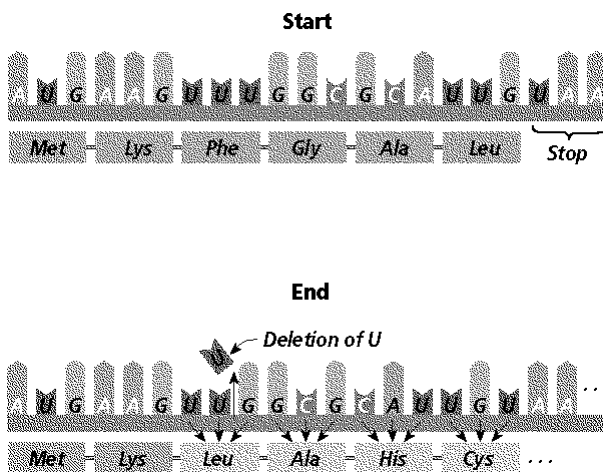
- \_\_\_\_ 16. The process illustrated in Figure 11-1 is called \_\_\_\_.
- monoploidy
  - replication
  - transcription
  - translation
- \_\_\_\_ 17. Which of the structures in Figure 11-1 are composed of RNA?
- I and V
  - II and IV
  - III and IV
  - III and V

Help Wanted
<b>Positions Available</b> in the genetics industry. Hundreds of entry-level openings for tireless workers. No previous experience necessary. Must be able to transcribe code in a nuclear environment. The ability to work in close association with ribosomes is a must.
<b>Accuracy and Speed</b> vital for this job in the field of translation. Applicants must demonstrate skills in transporting and positioning amino acids. Salary commensurate with experience.
<b>Executive Position</b> available. Must be able to maintain genetic continuity through replication and control cellular activity by regulation of enzyme production. Limited number of openings. All benefits.
<b>Supervisor</b> of production of proteins—all shifts. Must be able to follow exact directions from double-stranded template. Travel from nucleus to the cytoplasm is additional job benefit.

**Table 11-1**

- \_\_\_\_ 18. Applicants for the fourth job of the Help Wanted ad in Table 11-1, "Supervisor," could qualify if they were \_\_\_\_.
- DNA
  - rRNA
  - mRNA
  - tRNA
- \_\_\_\_ 19. Applicants for the third job of the Help Wanted ad in Table 11-1, "Executive Position," could qualify if they were \_\_\_\_.
- rRNA
  - DNA
  - tRNA
  - mRNA
- \_\_\_\_ 20. Applicants for the second job of the Help Wanted ad in Table 11-1, "Accuracy and Speed," could qualify if they were \_\_\_\_.
- tRNA
  - rRNA
  - DNA
  - mRNA
- \_\_\_\_ 21. There are 64 different mRNA codons in the genetic code. How many possible codons would there be if a codon consisted of only two nucleotides?
- 64
  - 8
  - 16
  - 32
- \_\_\_\_ 22. Many chromosome mutations result when chromosomes fail to separate properly during
- mitosis.
  - meiosis.
  - crossing over.
  - linkage.
- \_\_\_\_ 23. An agent that can cause a change in DNA is called a(n)
- mutation.
  - zygote.
  - mutagen.
  - inversion.
- \_\_\_\_ 24. A mutation is any mistake or change in the
- DNA sequence.
  - cell.

- b. nucleus. d. ribosomes.
25. Chromosomal mutations are especially common in  
a. bacteria. c. animals.  
b. humans. d. plants.
26. The failure of homologous chromosomes to separate properly is called  
a. disjunction. c. translocation.  
b. deletion. d. nondisjunction.
27. Mutations that occur at random are called  
a. nonspontaneous mutations. c. nonrandom mutations.  
b. environmental mutations. d. spontaneous mutations.
28. Translation is the process of synthesizing protein from RNA. Which of the following molecules transports amino acids from the cytoplasm to the ribosome for translation?  
a. tRNA c. mRNA  
b. rRNA d. All of the above
29. The pairing of \_\_\_\_\_ in DNA is the key feature that allows DNA to be copied.  
a. nucleotides c. codons  
b. nitrogen bases d. chromosomes
30. Which of the following do DNA and RNA have in common?  
a. Both contain phosphate groups. c. Both contain ribose molecules.  
b. Both are double-stranded. d. Both contain thymine.
31. The process of cell division requires the parent cell to synthesize more DNA molecules. These molecules are produced by which of the following mechanisms?  
a. Transcription c. Mitosis  
b. Replication d. Translation
32. In most organisms, the start of translation is signaled by an AUG codon. What is the first amino acid in most proteins?  
a. Proline c. Leucine  
b. Isoleucine d. Methionine
33. Mutations in body cells can sometimes result in  
a. cancer. c. new species.  
b. sterile offspring. d. hybrids.



**Figure 11-4**

34. What type of mutation has occurred in Figure 11-4?

- a. protein
- b. point mutation

- c. frame shift
- d. lethal

- \_\_\_\_ 35. What will be the result of the mutation in Figure 11-4?
- nearly every amino acid in the protein will be changed
  - it will have no affect on protein function
  - only one amino acid will change
  - the organism will die
- \_\_\_\_ 36. An RNA molecule is a polymer composed of subunits known as \_\_\_\_.
- uracil molecules
  - polysaccharides
  - ribose molecules
  - nucleotides
- \_\_\_\_ 37. A DNA segment is changed from -AATTAG- to -AAATAG-. This is a \_\_\_\_.
- deletion
  - point mutation
  - frameshift mutation
  - inversion
- \_\_\_\_ 38. The two strands of DNA in the double helix structure are held together by which of the following interactions?
- Ionic bonds
  - Hydrogen bonds
  - Covalent bonds
  - Van der Waals forces
- \_\_\_\_ 39. A DNA segment is changed from -AATTAGAAATAG- to -ATTAGAAATAG-. This is a \_\_\_\_.
- translation
  - frameshift mutation
  - point mutation
  - inversion
- \_\_\_\_ 40. Ribosomes are made of \_\_\_\_.
- protein and tRNA
  - rRNA and mRNA
  - rRNA and protein
  - tRNA and mRNA
- \_\_\_\_ 41. When part of one chromosome breaks off and is added to a different chromosome, the result is a(n)
- insertion.
  - inversion.
  - translocation.
  - deletion.
- \_\_\_\_ 42. Which series is arranged in order from largest to smallest in size?
- cell, nucleotide, nucleus, DNA, chromosome
  - chromosome, nucleus, cell, DNA, nucleotide
  - cell, nucleus, chromosome, DNA, nucleotide
  - nucleotide, chromosome, cell, DNA, nucleus
- \_\_\_\_ 43. The chromosome abnormality that occurs when part of one chromosome breaks off and is added to a different chromosome is \_\_\_\_.
- inversion
  - deletion
  - translocation
  - nondisjunction
- \_\_\_\_ 44. Watson and Crick were the first to suggest that DNA is \_\_\_\_.
- the genetic material
  - a protein molecule
  - the shape of a double helix
  - a short molecule
- \_\_\_\_ 45. Some mutagens, such as the sun's UV radiation, cause mutations in somatic cells, such as dermal cells. Which of the following is NOT likely to occur as a result of such a mutation?
- Skin cancer may develop in the exposed individual.
  - Exposed skin cells may function improperly.
  - Skin cancer may develop in the offspring of the exposed individual.
  - All of the above consequences are likely.

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