DNA Practice Test

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

____ 1. Which of the following is a nucleotide found in DNA?
a. ribose + phosphate group + thymine
b. ribose + phosphate group + uracil
c. deoxyribose + phosphate group + uracil
d. deoxyribose + phosphate group + cytosine

____ 2. Because of base pairing in DNA, the percentage of
a. adenine molecules in DNA is about equal to the percentage of guanine molecules.
b. pyrimidines in DNA is about equal to the percentage of purines.
c. purines in DNA is much greater than the percentage of pyrimidines.
d. cytosine molecules in DNA is much greater than the percentage of guanine molecules.

____ 3. In eukaryotes, DNA
a. is located in the nucleus.
b. floats freely in the cytoplasm.
c. is located in the ribosomes.
d. is circular.

____ 4. DNA is copied during a process called
a. replication.
b. translation.
c. transcription.
d. transformation.

____ 5. DNA replication results in two DNA molecules,
a. each with two new strands.
b. one with two new strands and the other with two original strands.
c. each with one new strand and one original strand.
d. each with two original strands.

____ 6. During DNA replication, a DNA strand that has the bases CTAGGT produces a strand with the bases
a. TCGAAC.
b. GATCCA.
c. AGCTTG.
d. GAUCCA.

____ 7. RNA contains the sugar
a. ribose.
b. deoxyribose.
c. glucose.
d. lactose.

____ 8. Unlike DNA, RNA contains
a. adenine.
b. uracil.
c. phosphate groups.
d. thymine.

____ 9. Which of the following are found in both DNA and RNA?
a. ribose, phosphate groups, and adenine
b. deoxyribose, phosphate groups, and guanine
c. phosphate groups, guanine, and cytosine
d. phosphate groups, guanine, and thymine

____ 10. How many main types of RNA are there?
a. 1
b. 3
c. hundreds
d. thousands

____ 11. Which type(s) of RNA is(are) involved in protein synthesis?
a. transfer RNA only
b. messenger RNA only
c. ribosomal RNA and transfer RNA only
d. messenger RNA, ribosomal RNA, and transfer RNA

____ 12. Which of the following are copied from DNA?
a. mRNA only
b. mRNA, tRNA, and rRNA
c. mRNA and tRNA only
d. proteins

____ 13. What is produced during transcription?
a. RNA molecules
b. DNA molecules
c. RNA polymerase
d. proteins

____ 14. During transcription, an RNA molecule is formed
a. that is complementary to both strands of DNA.
b. that is identical to part of a single strand of DNA.
c. that is double-stranded.
d. inside the nucleus.

____ 15. Which of the following statements is true?
a. A promoter is part of an intron.
b. A pre-mRNA molecule is longer than the gene from which the molecule was transcribed.
c. Introns are sequences of DNA.
d. Any mRNA molecules made from the same gene are always edited the same way.

____ 16. How many codons are needed to specify three amino acids?
a. 3
b. 6
c. 9
d. 12

____ 17. Why is it possible for an amino acid to be specified by more than one kind of codon?
a. Some codons have the same sequence of nucleotides.
b. There are 64 different kinds of codons but only 20 amino acids.
c. Some codons do not specify an amino acid.
d. The codon AUG codes for the amino acid methionine and serves as the “start” codon for protein synthesis.

____ 18. What happens during the process of translation?
a. Messenger RNA is made from DNA.
b. The cell uses information from messenger RNA to produce proteins.
c. Transfer RNA is made from messenger RNA.
d. Copies of DNA molecules are made.

____ 19. During translation, the type of amino acid that is added to the growing polypeptide depends on the
a. codon on the mRNA only.
b. anticodon on the mRNA only.
c. anticodon on the tRNA to which the amino acid is attached only.
d. codon on the mRNA and the anticodon on the tRNA to which the amino acid is attached.

____ 20. Genes contain instructions for assembling
a. purines.
b. nucleosomes.
c. proteins.
d. pyrimidines.

____ 21. Which type of RNA functions as a blueprint of the genetic code?
a. rRNA
b. tRNA
c. mRNA
d. RNA polymerase

____ 22. Which of the following statements is false?
a. Some genes code for enzymes.
b. The instructions for making some proteins are not specified by genes.
c. An organism's inherited traits depend on proteins.
d. An organism's genes determine its inherited traits.

____ 23. A mutation that involves one or a few nucleotides is called a(an)
a. chromosomal mutation.
b. inversion.
c. point mutation.
d. translocation.

____ 24. Which of the following is NOT a gene mutation?
a. inversion
b. insertion
c. deletion
d. substitution

____ 25. Which of the following is NEVER a frameshift mutation?
a. substitution
b. insertion
c. deletion
d. point mutation

____ 26. Gene regulation in eukaryotes
a. usually involves operons.
b. is simpler than in prokaryotes.
c. allows for cell specialization.
d. includes the action of an operator region.

Modified True/False
Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

____ 27. If a nucleic acid contains uracil, it is DNA. _____

____ 28. The nitrogenous bases in RNA are able to form hydrogen bonds with each other. _____

____ 29. During DNA replication, only one strand of DNA serves as a template. _____

____ 30. A codon consists of four nucleotides. _____

____ 31. The anticodon AGA is complementary to the codon TCT. _____

____ 32. DNA codes for DNA polymerase. _____

____ 33. Without regulatory sites, the expression of a gene would not be controlled. _____

____ 34. In prokaryotes, an operon is a group of genes that are operated together. _____

____ 35. Gene regulation in eukaryotes is less complex than in prokaryotes. _____

Completion
Complete each statement.

36. The Watson and Crick model of DNA is a(an) _____, in which two strands are wound around each other.

37. During transcription, the _____ between base pairs are broken.

38. The order of nitrogenous bases in DNA determines the order of _____ in proteins.

39. There is no _____ that is specified by a stop codon on an mRNA molecule.

40. The _____ of a tRNA molecule determines the type of amino acid that bonds with the tRNA.

41. Suppose that part of an amino acid sequence of a protein changed from tyrosine-proline-glycine-alanine to tyrosine-histidine-glycine-alanine. This change was most likely caused by a point mutation called a(an) _____.

42. A point mutation will cause the cell to make an incomplete polypeptide if the mutation results in a(an) _____.

43. A typical gene consists of regulatory sites, a(an) _____, and the nucleotide sequence that is transcribed.

Short Answer

44. What is a bacteriophage?

45. If the percentage of guanine in the DNA of a certain species decreased by 5 percent over time, what would you expect to have happened to the percentage of adenine in that DNA?

46. What are the three main parts of an RNA nucleotide?

47. What would happen if codons consisted of fewer than 3 bases?

48. What causes translation to stop?

49. Which genes do not code for proteins?

50. What is a mutation?