crack the code answer key

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. How many codons are needed to specify three amino acids?

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | **3** | c. | 9 |
| b. | 6 | d. | 12 |

3. A DNA segment is changed from -AATTAGAAATAG- to -ATTAGAAATAG-. This is a

|  |  |  |  |
| --- | --- | --- | --- |
| a. | translation | c. | Inversion |
| **b.** | **frameshift mutation** | d. | point mutation |

4. The following sequence of DNA is part of a gene. How many amino acids are coded for by this segment? 5’ ATCAGCGCTGGC 3’

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | **4** | c. | 12 |
| b. | 8 | d. | 20 |

5. Genetic information usually flows in one specific direction (more commonly known as “The Central Dogma”). Which of the following best represents this flow?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | DNA → Protein → RNA | **c.** | **DNA → RNA → Protein** |
| b. | Protein → DNA → RNA | d. | RNA → Protein → DNA |

6. Which of these represents the DNA segment from which this section of mRNA was transcribed?

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | **ACT AAG** | c. | CCU TTG |
| b. | GAA UCU | d. | UCC TGA |

7. Which of the following is a change that could be passed on to an organism’s offspring?

|  |  |
| --- | --- |
| **a.** | **Damage to the DNA of sex cells** |
| b. | Damage to skin cells from exposure to sunlight |
| c. | Damage to DNA in the cytoplasm of cheek cells |
| d. | Damage to hair pigment cells with permanent dyes |

8. Use the “mRNA chart” provided. The assembly of a messenger RNA strand that normally begins with UAC has been changed so that the newly assembled messenger RNA strand begins with UAG. Which of the following will most likely occur?

|  |  |
| --- | --- |
| a. | The protein will be missing the first amino acid. |
| b. | The amino acids that make up the protein will all be different. |
| c. | The mRNA will become attached to a ribosome. |
| **d.** | **The production of the protein will be stopped.** |

9. Which method would a biologist use to view the site of protein production in a plant cell?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | use a magnifying glass to view the chloroplasts | c. | use a microscope to view the chloroplasts |
| b. | use a magnifying glass to view the ribosomes | **d.** | **use a microscope to view the ribosomes** |

10. Which of the following nucleotide chains could be part of a molecule of RNA?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | A-T-G-C-C-A | c. | A-A-T-A-A-A |
| b. | G-C-C-T-T-G | **d.** | **A-U-G-C-C-A** |

11. DNA sequences are often used to determine relationships between organisms. DNA sequences that code for a particular gene can vary, although organisms that are closely related will have very similar sequences. This table shows the amino acid sequences of 4 organisms. Based on these sequences, which two organisms are the most closely related?

|  |  |  |  |
| --- | --- | --- | --- |
| **a.** | **Human: C C A - T A G - C A C - C T A** | **c.** | **Chimpanzee: C C A - T A A - C A C - C T A** |
| b. | Pig: C C A - T G T - A A A - C G A | d. | Cricket: C C T - A A A - G G G- A C G |

12. Hereditary information is determined by molecules of

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Carbohydrate | c. | Lipids |
| b. | Proteins | **d.** | **Nucleic acids** |

13. The process by which messenger RNA is made from a DNA molecule is called

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Replication | c. | Translation |
| **b.** | **Transcription** | d. | Translocation |

14. The diagram below shows a segment of a gene before and after a process. Diagram

Description automatically generated

Which is a result of the process shown in the diagram?

|  |  |
| --- | --- |
| a. | An identical DNA sequence that will code for an identical protein |
| b. | A shorter RNA sequence that will code for a shorter protein |
| **c.** | **A substituted base in the DNA molecule that could change the structure of a protein** |
| d. | An added base in the RNA molecule that could change the structure of a protein |

15. What is a source of genetic variation?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Adaptation | **c.** | **Mutation** |
| b. | Replication | d. | Transcription |