Short answer / critical thinking

1. Describe the three main ways in which RNA differs from DNA.
2. Why is messenger RNA necessary for protein synthesis?
3. How did Watson and Crick’s model of DNA depend in part on the work of Rosalind Franklin?
4. Why is the AUG codon necessary for protein synthesis?
5. If a single strand of DNA is placed in a test tube with RNA polymerase and the correct nucleotides, messenger RNA is synthesized. Explain why this synthesis is possible.

Determine if each of the following statements is true or false.

1. A sequence of three nucleotides that specifies a particular amino acid is a codon. \_\_\_\_
2. A molecule of transfer RNA is usually enclosed within an organelle. \_\_\_\_
3. Ribosomal RNA probably serves to bind other forms of RNA to ribosomes temporarily. \_\_\_\_
4. A single strand of DNA acts as a template for more DNA. \_\_\_\_
5. A molecule of DNA both duplicates itself and stores information. \_\_\_\_
6. One result of Rosalind Franklin’s x-ray patterns of DNA is the understanding that the fibers of DNA are complementary. \_\_\_\_
7. The attraction between the two strands of the DNA double helix is known as base pairing. \_\_\_
8. DNA replication cannot occur without a series of enzymes. \_\_\_\_
9. The “backbone” of a strand of DNA consists of nucleotides. \_\_\_\_
10. Each amino acid molecule transferred by tRNA is specified by the anticodon of tRNA. \_\_\_\_

Fill in the blank. Write the following statements with its missing words.

1. The two strands of a DNA helix are \_\_\_\_.
2. After replication of DNA, the two double helices are \_\_\_\_.
3. In protein synthesis, the amino acids are joined together by \_\_\_\_ bonds.
4. Protein synthesis begins when messenger RNA binds to \_\_\_\_.
5. Each combination of three nitrogenous bases on a messenger RNA forms is a(n) \_\_\_\_.
6. Both DNA and RNA are \_\_\_\_ acids.
7. Viruses that infect bacteria are known as \_\_\_\_.
8. The Watson-Crick model of DNA is described as a(n) \_\_\_\_.
9. DNA duplicates itself by \_\_\_\_.
10. Each strand of DNA serves as a \_\_\_\_ against which a new strand is made.
11. Unlike DNA, RNA contains the nitrogenous base \_\_\_\_.
12. The process by which a molecule of DNA is copied into a strand of RNA is \_\_\_\_.
13. In protein synthesis, a polypeptide chain continues to grow until the ribosome reaches a(n) \_\_\_\_.
14. Each codon specifies a particular \_\_\_\_.
15. Messenger RNA is decoded into a polypeptide chain by the process of \_\_\_\_.
16. A molecule of transfer RNA picks up an amino acid in the \_\_\_\_ of a cell.
17. Messenger RNA carries out its function on the \_\_\_\_.
18. The letters DNA are an abbreviation for \_\_\_\_.
19. The Hershey-Chase experiments on bacteriophage showed conclusively that the genetic code was carried in\_\_\_\_\_.
20. The amino acid that becomes attached to a molecule of transfer RNA is specified b a(n) \_\_\_\_.
21. In protein synthesis, the ribosomes\_\_\_\_\_\_.
22. Transfer RNA becomes attached to messenger RNA by \_\_\_\_.
23. The first part of protein synthesis begins when\_\_\_\_.
24. The decoding of a messenger RNA message into a protein is known as \_\_\_\_.
25. A single strand of DNA acts as a template for\_\_\_\_.
26. The scientist who found that DNA was the transforming factor between two strains of pneumonia bacteria were \_\_\_\_.
27. A virus is made up of a \_\_\_\_.
28. The three type of RNA are produced in the \_\_\_\_.
29. Adenine and guanine are\_\_\_\_.
30. To account for x-ray evidence that the fibers of DNA are probably twisted, Watson and Crick gave their model the shape of a \_\_\_\_.
31. Before a cell divides, the DNA must duplicate itself by\_\_\_\_.
32. If one strand of DNA has the nitrogenous bases AACTG, the complementary strand has bases\_\_\_\_.
33. In the formation of a molecule of RNA from DNA, adenine bonds to\_\_\_\_.
34. The two strands of DNA double helix are held together by\_\_\_\_.
35. The information that directs protein synthesis is in DNA’s\_\_\_\_