General Biology –Chapter 12 Review

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This review is meant to highlight basic concepts from Chapter12. It does not cover all concepts presented by your instructor. Refer back to your notes, unit objectives, labs, handouts, etc. to further prepare for your exam.

1. Briefly explain how the following scientists contributed to the current understanding of DNA as the genetic material: Griffith, Avery, Chargaff, Franklin, Watson and Crick
2. Explain the process of DNA replication. When and why does it occur? What are the steps and the enzymes necessary to complete the process?
3. Compare the structure of DNA to that of RNA.
4. Explain the central dogma of molecular biology.
5. Describe the process of transcription. What steps and enzymes are necessary? What is the role of mRNA in making a protein? Where is mRNA located?
6. Describe the process of translation. Where does it occur? What are the steps? What is the role of tRNA? The role of rRNA? The role of mRNA? The role of amino acids?
7. Describe the structure of a eukaryotic chromosome.

Matching: Terms of Molecular Biology

8. _____3 sequence code held in the mRNA, matches complementarily to the anticodons of tRNA
9. _____3 sequence code held in the tRNA, it must match complementarily to the codon to allow an amino acid to be dropped off at the ribosome
10. _____A molecule that contains an anticodon and brings the appropriate amino acid to the ribosome
11. _____A nucleic acid that holds the code for genetic traits, composed of 2 complementary chains of nucleotides wound in a double helix.
12. _____Building blocks of a protein, there are 20 that in different combinations make up all proteins
13. _____Building unit of nucleic acids, made up of a sugar, phosphate, and nitrogen base
14. _____The DNA code is carried in this molecule to the cytoplasm where translation occurs
15. _____The process by which a copy of the DNA sequence is made into an mRNA
16. _____The process by which the code in the mRNA is read to bring certain amino acids over to the ribosome to build a protein
17. _____The process by which the sequence in DNA is turned into a functioning protein
18. _____The step of translation in which a polypeptide increases in length one amino acid at a time.
19. _____The step of translation in which the polypeptide is released and the components disassemble.
20. _____The step of translation that brings all the components together

    a. Amino acid
    b. Anti-codon
    c. Codon
    d. DNA
    e. Elongation
    f. Initiation
    g. mRNA
    h. Nucleotide
    i. Protein synthesis
    j. Termination
    k. Transcription
    l. Translation
    m. tRNA

Fill in the blank/True or False: Heredity (if false, what makes the statement true?):

21. The purine bases, adenine and guanine, have a double ring. True or False?
22. The Pyrimidine bases, thymine and cytosine, have a double ring. True or False?
23. Helicase is an enzyme that unwinds DNA during replication. True or False?
24. During DNA replication: DNA polymerase synthesizes the daughter strand in the ___' to ___' direction. #8
25. During DNA replication: the enzyme _____adds new nucleotides to a DNA template. #9
26. In prokaryotes, DNA replication occurs at numerous replication forks. True or False?
27. The amino acid sequence: methionine-proline-aspararagine-lysine-serine-stop contains _____ codons.
28. Each amino acid has one specific codon. True or False?
29. Semiconservative DNA replication means the old strand serves as a template for the new strands. True or False?
30. During elongation of translation: the process of the ribosome moving forward to the next site is called _____.
31. If a DNA sample contains 15% guanine, the percentage of cytosine is _____, adenine is _____, and thymine is _____.
32. If the sequence of bases in a strand of a DNA is CGAATG, give the complementary strand:_____.
33. If the sequence of bases in a strand of DNA is CGAATG, give the transcribed sequence_____.
34. The resulting sequence in question #30 produces a molecule of ribosomal RNA. True or False?
35. Transcription begins when RNA polymerase binds to a region of DNA called the promotor. True or False?
36. The mRNA sequence AUCCCAGACUCU produces the following amino acid chain:_____ _____.
37. An anticodon is a group of three bases on mRNA that is complementary to a specific tRNA codon. True or False?