

## DNA Replication and Protein Synthesis Test Review

Name \_\_\_\_\_ Date \_\_\_\_\_

### DNA Replication:

1. In his transformation experiments, what did Griffith observe?
2. Adenine makes up 28% of the nucleotides in a sample of DNA from an organism. Approximately what percentage of the nucleotides in this sample will be guanine?
3. What was the conclusion from Chargaff's experiment?
4. What is meant by the description "antiparallel" regarding the strands that make up DNA?
5. Suppose you are provided with an actively dividing culture of *E. coli* bacteria to which radioactive thymine has been added. What would happen if a cell replicates once in the presence of this radioactive base?
6. Which enzyme catalyzes the elongation of a DNA strand in the 5' → 3' direction?
7. The leading and the lagging strands differ in that\_\_\_\_\_.
8. What is the function of topoisomerase?
9. What enzyme joins Okazaki fragments together?
10. What would you expect of a eukaryote lacking telomerase?
11. Which enzyme removes the RNA nucleotides from the primer and adds equivalent DNA nucleotides to the 3' end of Okazaki fragments?
12. Which enzyme separates the DNA strands during replication?
13. Which enzyme synthesizes short segments of RNA?
14. Describe Meselson and Stahl's experiment and what the results looked like after the first and the second generations.
15. What is a nucleosome?

### Protein Synthesis

16. A particular triplet of bases in the template strand of DNA is 5'TGC3'. The corresponding codon for the mRNA transcribed is\_\_.
17. What are 3 ways that mRNA is edited before leaving the nucleus?
18. Why would prokaryotes not have these caps added to its mRNA?
19. Where does a spliceosome attach to on the primary mRNA transcript?
20. What is a UTR?

21. If a mutation removes the 5'GTP cap, what would probably happen to the mRNA when it leaves the nucleus?
22. What is the wobble base?
23. Describe what happens in the EPA sites of the ribosome.
24. What is the function of the release factor (RF)?
25. What site in the ribosome do the RFs bind to?
26. Which mutations would probably have the most severe effect on the protein; deletion/insertion or substitution?
27. Why?
28. Why would deleting only two nucleotides have a potentially greater effect than deleting a whole codon?
29. What was Beadle and Tatum's experiment?
30. What is the function of the GTP cap in translation?
31. What does methylation of the DNA do to the transcription of that gene?
32. What does allosteric mean?
33. What would bind to a repressor protein to remove it from the operator?