

gangsta_duck's Designer Genes Practice Test Answer Key

Note: Partial credit is allowed.

1. 5'
2. Helicase; it separates the two parental DNA strands.
3. Lagging strand
4. Ribose
5. Topoisomerase
6. It binds to single-stranded DNA and prevents it from reattaching to the other strand.
7. C
8. 3' – GGAGATCAATTCCGTC AACGACAATCCTTTAATCGACGTATCCAGAG – 5' (remove one point for each mistake)
9. 1. Denaturation of DNA; 2. Primer annealing; 3. Primer extension
10. Denaturation – 95; Annealing – 45-68; Extension – 72
11. C
12. A
13. Yes
14. More
15. Restriction fragment length polymorphism
16. Met-Val-Ala-Gln-Leu-Pro-Ser
17. Met-Val-Ala
18. It would be shorter.
19. It is a nonsense mutation.
20. Since the stop codon occurs early, the carboxyl end of the protein wouldn't be able to attach to the fiber, and, thus, no fiber would be on the stem.
21. Allolactose
22. Lactose metabolism decreases, as cAMP levels would decrease, reducing the chance that RNA polymerase would attach to the promoter, thus also reducing the chance that the enzymes that metabolize lactose would be synthesized.
23. Tryptophan
24. Sample 1 is double-stranded DNA because thymine is present and the percentage of adenine and thymine, as well as guanine and cytosine, are equal. Sample 2 is single-stranded RNA because uracil is present, and %A ≠ %U, and %C ≠ %G. Sample 3 is double-stranded RNA because %A = %U, %C = %G, and uracil is present. Sample 4 is single-stranded DNA because %A ≠ %T, %C ≠ %G, and thymine is present.
25. 34
26. 45
27. 5
28. translation
29. CGA
30. aminoacyl tRNA synthetase
31. Any five of the following are acceptable. The sugar ring is incorrect—the uppermost carbon should be an oxygen. The phosphate of the bottom nucleotide should be bound to the 3' carbon, not the 2' carbon. The position of the base attachment is incorrect—it should be

attached to the rightmost carbon. The 2' carbon should be attached to two hydrogens. The 3' carbon should be attached to a hydrogen and a hydroxyl group. The middle phosphorus atom should be double bonded to the oxygen atom on its left. The carbon below the phosphate group should be bonded to a hydrogen, not a hydroxyl group. There should be an oxygen between the carbon and phosphorus.

32. D
33. B
34. F
35. C
36. A
37. E
38. Along with a protein complex, it attaches to an mRNA molecule, and depending on how many complementary nucleotides between the two strands, either degrading the mRNA or preventing its translation.
39. A
40. ubiquitin
41. T
42. F
43. T
44. F
45. T
46. GAU → GGU; GAC → GGC
47. B
48. phosphate group
49. C
50. small nuclear ribonucleoprotein
51. A