Answers Genetic Engineering Test Review

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4. A 5. A 6. B 7. C 8. C 9. A 10. A

15. Large DNA molecules are cut up using restriction enzymes that recognize and cut specific nucleotide sequences in DNA.

16. Gel electrophoresis enables scientists to separate and analyze DNA fragments, to compare genomes of different individuals and organisms, and to identify a specific gene.

18. During PCR, a short piece of complementary DNA (a primer) is added to both ends of the DNA fragment to be copied. The DNA is heated to separate the two strands, and then cooled. DNA polymerase makes copies of the region between the two primer sequences. The copies also serve as templates to make more copies. 30 – 40 cycles of heating and cooling can quickly produce thousands of copies of DNA.

19. During cell transformation, a cell takes in DNA from outside the cell, and the external (foreign) DNA becomes part of the cell's DNA. Bacteria, plant and animal cells are all types of cells that have been transformed.

22. A transgenic organism is an organism that contains genes from another organism (often a different species). They are used to produce important substances for health and industry (e.g. human insulin is produced by transgenic bacteria; cows that produce human proteins in milk; plants that produce natural insecticides).

23. Ian Wilmut removed the nucleus of an egg cell and replaced it with a nucleus taken from another adult. This egg was then placed in the uterus of a surrogate mother, where is developed normally.

25. Human proteins produced through genetic engineering can be produced relatively inexpensively in large quantities. They are the actual human protein, and are pure.

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9. A

10. A

20. During DNA fingerprinting, a small sample of DNA is cut with restriction enzymes. The fragments are separated by size using gel electrophoresis. The DNA fragments are labeled using a dye, and a pattern of bands that are unique to the individual is produced on the gel.