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15 Genetic Engineering Chapter Test B

Multiple Choice

Write the letter that best answers the question or completes the statement on the line provided.

_____ **1.** Which of the following has the disadvantage of possibly bringing two recessive alleles together and causing a genetic defect?

a. inbreeding **c.** genetic engineering
b. hybridization **d.** transformation

_____ **2.** To create animals that have the characteristics of both species, some people have bred buffalo and cattle together. This is an example of

a. inbreeding **c.** genetic engineering
b. hybridization **d.** transformation

_____ **3.** A gene that makes it possible to distinguish bacteria that have been transformed by a plasmid from those that have not is called

a. a resistance gene. **c.** a genetic marker.
b. an antibiotic. **d.** a clone.

_____ **4.** What does Figure 15–1 represent?

a. gel electrophoresis being used to sequence DNA
b. hybridization being used to manipulate DNA
c. an enzyme being used to cut DNA
d. polymerase chain reaction being used to copy DNA

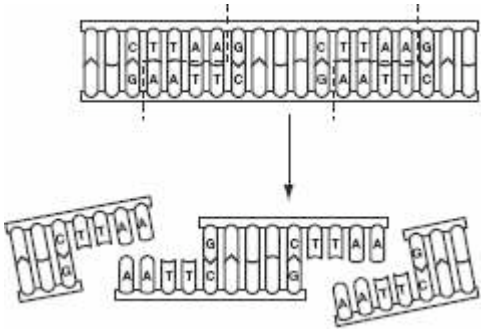

Figure 15–1

_____ **5.** In Figure 15–1, between which nucleotides is the DNA cut?

a. adenine and thymine
b. cytosine and guanine
c. thymine and cytosine
d. adenine and guanine

_____ **6.** A DNA molecule produced by combining DNA from different sources is known as

a. a mutant. **c.** a polyploid.
b. a hybrid. **d.** recombinant DNA.

_____ **7.** Which of the following would require the use of recombinant DNA?

a. Crossing two apple trees to create better apples.
b. Breeding a donkey and a horse to make a mule.
c. Engineering bacteria that produce human insulin.
d. Creating a polyploid banana tree.

_____ **8.** A plant cell is successfully transformed if

a. a plasmid enters the cell and the cell breaks down the plasmid.
b. the cell integrates foreign DNA into one of its chromosomes.
c. the cell reproduces normal offspring, which also produce offspring.
d. a plasmid is unable to enter the cell.

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_____ **9.** What has been an advantage of producing transgenic plants?

a. increasing the food supply **c.** producing clones

b. using more pesticides **d.** studying human genes

_____**10.** Which of the following is a direct benefit to farmers planting Bt corn?

a. Farmers can increase the use of herbicides.

b. Farmers can decrease their use of herbicides.

c. Farmers can increase their use of insecticides.

d. Farmers can decrease their use of insecticides.

_____**11.** Why would the procedure in Figure 15–2 be performed?

a. to identify a parent

b. to treat a genetic disease

c. to clone an animal

d. to identify active genes

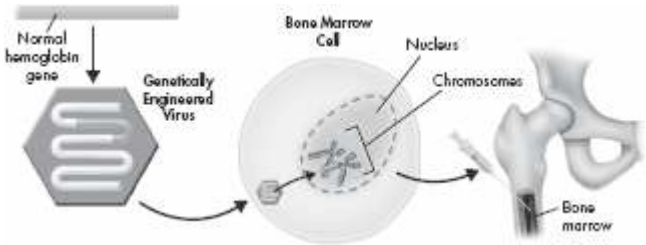

Figure 15–2

_____**12.** The use of DNA fingerprinting relies on the fact that

a. the most important genes are different among most people.

b. no two people, except identical twins, have exactly the same DNA.

c. most genes used for identification are dominant.

d. DNA fingerprints from different people can look very similar.

_____**13.** Which of the following is true of the Genetic Information Nondiscrimination Act?

a. It protects Americans against being treated differently by employers or insurance companies based on their genetic information.

b. It prevents scientists from patenting the genes they discover if those genes were found in other people.

c. It allows parents the legal right to choose specific genes for their children if the technology becomes available.

d. It makes it legal for companies that produce genetically modified crops to keep their genetic technologies a secret.

_____**14.** One reason farmers often choose GM crops over non-GM crops because GM crops are

a. much safer. **c.** less expensive.

b. more productive **d.** less controversial.

_____**15.** Which statement below might be used by someone who is arguing against the use of GM crops?

a. GM crops reduce the amount of land and energy that need to be devoted to agriculture because they have high yields.

c. GM crops need more insecticide to be used than other crops because they grow faster.

b. The patents for the seeds of GM crops are held by big companies, which may raise prices and force small farmers out of business.

d. No studies have shown that GM crops are dangerous to human health.

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Completion

Complete each statement on the line provided.

16. Bananas planted as crops are _____ plants which have 2 or 3 times the normal diploid number of chromosomes.

17. Some plasmids have genes that make bacteria resistant to _____, which allows scientists to easily determine which bacteria have been transformed.

18. DNA finger printing has dramatically changed the field of _____, which is the study of crime scene evidence.

19. Critics of GM crops worry that GM plants engineered to be resistant to insects might unintentionally kill _____ insects.

Short Answer

In complete sentences, write the answers to the questions on the lines provided.

20. What are structures C and D in Figure 15–3, and what is their significance?

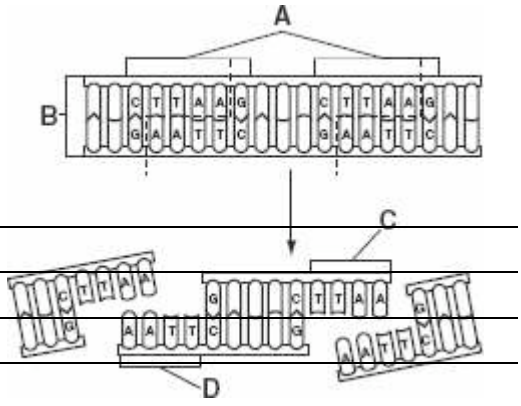

Figure 15–3

21. Briefly explain what plasmids are and how they can be used to create transgenic organisms.

22. What does the polymerase chain reaction enable scientists to do?

23. How would making crops resistant to herbicides assist farmers?

24. Why are viruses used in gene therapy?

25. Why do scientists use sections of DNA repeats that have little or no known function to do DNA fingerprinting?

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Using Science Skills

Use the diagram below to answer the following questions on the lines provided.

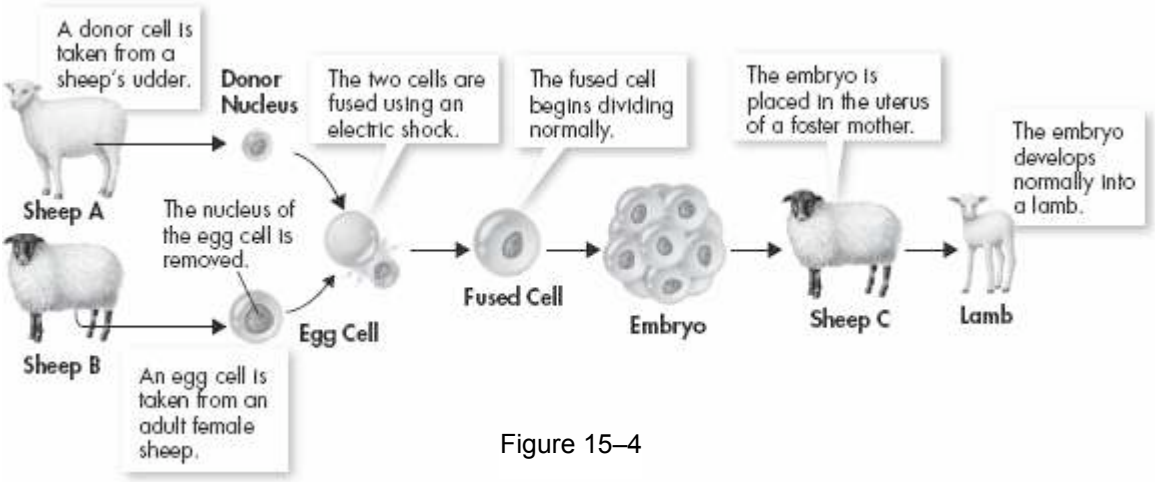

Figure 15–4

26. Interpret Visuals In the process shown in Figure 15–4, which sheep is the source of the nucleus in the fused cell?

_____

_____

27. Infer In Figure 15–4, why was the nucleus removed from the egg cell?

_____

_____

_____

_____

28. Interpret Visuals Which animal in Figure 15–4 is a clone?

_____

29. Interpret Visuals In the cloning shown in Figure 15–4, which sheep provided an egg cell?

_____

30. Infer Which two animals in Figure 15–4 are genetically identical?

_____

_____