

Bio12-Q2W7-Test1--Biotechnology

Completion

Complete each statement.

- | | |
|-------------------------|-------------------------|
| A. inbreeding | B. Transgenic organisms |
| C. human genome | D. linkage map |
| E. test cross | F. Hybrids |
| G. homozygous recessive | H. heterozygous |
| I. Restriction enzymes | J. Plasmid |
| K. cell culture | L. Vectors |
| M. Gene therapy | |

- _____ is used to develop pure breeds.
- A(n) _____ shows the relative location of genes on a chromosome.
- The entire collection of genes within human cells is referred to as the _____.
- _____ are produced when DNA from another species is inserted into the genome of an organism, which then begins to produce the protein encoded on the recombinant DNA.
- Usually the parent with the known genotype is _____ for the trait in question.
- Many crop plants such as wheat and corn have been developed as _____ in order to develop larger and stronger plants.
- Organisms that are homozygous dominant and those that are _____ for a trait controlled by Mendelian inheritance have the same phenotype.
- When two cultivars are crossed, their offspring will be _____.
- To determine if an individual with a dominant phenotype is homozygous or heterozygous, a _____ is used.
- For the diagnosis of a genetic disorder, many cells are required, but only a few need to be taken from the individual. These cells are grown in a _____ so that enough DNA can be obtained to run the necessary tests.
- _____ is an application of the Human Genome Project that involves the insertion of normal genes into cells with defective genes in an attempt to correct genetic disorders.
- _____ are used to cleave DNA into fragments.
- A(n) _____ is a small ring of DNA found in a bacterial cell.
- A _____ determines whether an organism is heterozygous or homozygous dominant for a trait.
- A gene gun and a virus may both be classified as _____ because they are mechanisms by which foreign DNA may be transferred into a host cell.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

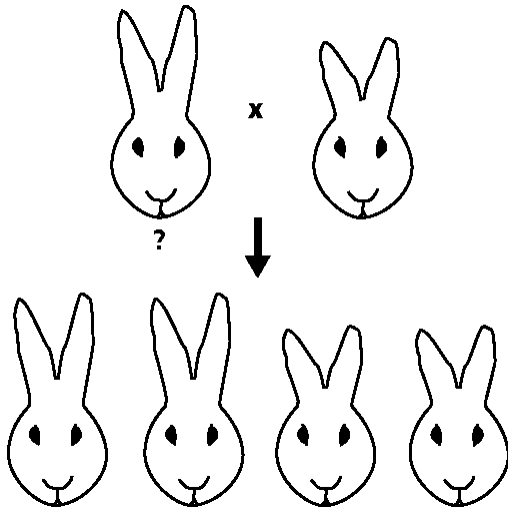


Figure 13-4

16. What is the genotype of the unknown rabbit in Figure 13-4?
- homozygous long ears
 - recessive
 - homozygous short ears
 - heterozygous
17. What would be the result of the test cross in Figure 13-4 if the unknown were homozygous long ears?
- 1/2 of the offspring would have long ears
 - all of the offspring would have long ears
 - all of the offspring would have short ears
 - 1/4 of the offspring would have short ears
18. A virus isolated from monkeys contains a circular double strand of DNA. The virus, called Simian Virus 40, interests scientists because it causes cancer in laboratory animals. Using a restriction enzyme, the strand is separated into six unequal segments, as shown in Figure 13-2. A scientist hypothesizes that the segment of DNA causing cancer can contain no fewer than 600 base pairs. Using Figure 13-2, decide which segments of the virus have the highest chance of containing the segment of interest. Identify in DESCENDING order, from the HIGHEST chance to the LOWEST.

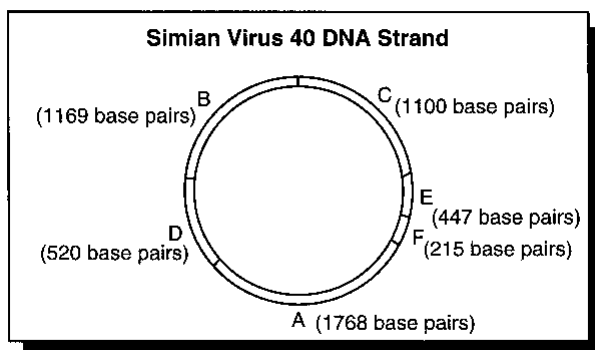


Figure 13-2

- C, B, A
- D, E, F
- F, E, D
- A, B, C

- ____ 19. In 1974, Stanley Cohen and Herbert Boyer inserted a gene from an African clawed frog into a bacterium. The bacterium produced the protein coded for by the inserted frog gene. The bacterium containing functional frog DNA would be classified as a ____.
- plasmid
 - clone
 - transgenic organism
 - DNA fingerprint
- ____ 20. Recombinant DNA are currently used to produce ____.
- all of these
 - clothing dye, cheese, and laundry products
 - crops that test better and stay fresh longer
 - human antibodies and vaccines
- ____ 21. In 1974, Stanley Cohen and Herbert Boyer inserted a gene from an African clawed frog into a bacterium. The bacterium produced the protein coded for by the inserted frog gene. This insertion of a small fragment of frog DNA into the DNA of another species can most accurately be called ____.
- genetic engineering
 - cloning
 - gene therapy
 - electrophoresis
- ____ 22. What must be on either end of any genetic material that is inserted into the cleaved DNA in Figure 13-5?



Figure 13-5

- AATT
 - ATAT
 - CGCG
 - CCGG
- ____ 23. The process used to separate DNA segments of different lengths is ____.
- PCR
 - gel electrophoresis
 - gene amplification
 - all of these
- ____ 24. Examine the pieces of DNA represented in Figure 13-1. Why are the nucleotide sequences on both strands referred to as palindromes?

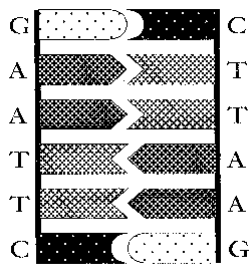


Figure 13-1

- the sequences show chromosome mutation
- the sequences are the same but run in opposite directions
- the DNA is an example of a transgenic codon
- each nucleotide is represented

- ____ 31. The historical method used to assign genes to particular human chromosome was to ____.
- conduct mating experiments
 - use linkage maps
 - study linkage data from human pedigrees
 - use biotechnology
- ____ 32. According to Figure 13-7, which DNA sequence will be cleaved by EcoRI, which cuts AATT/TTAA?

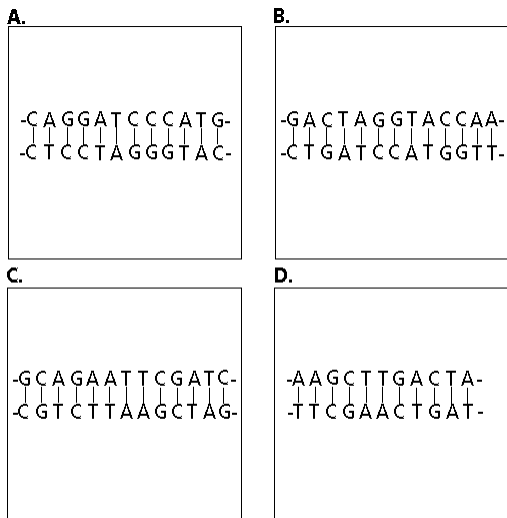


Figure 13-7

- D
 - B
 - C
 - A
- ____ 33. Listed below are procedures involved in the production of a transgenic organism. From the choices provided, select the sequence that represents the proper order of events.
- Recombinant DNA is transferred into a bacterial cell.
 - A specific gene is identified in a DNA sequence.
 - The DNA fragment is recombined into a vector.
 - The DNA fragment to be inserted is isolated.
- 1, 2, 3, 4
 - 2, 4, 3, 1
 - 4, 1, 2, 3
 - 2, 3, 1, 4
- ____ 34. A small amount of DNA obtained from a mummy or from frozen remains of a human may be cloned. In order to clone small amounts of DNA, ____ needs to be used to generate larger quantities of the DNA.
- gel electrophoresis
 - DNA fingerprinting
 - gene splicing
 - polymerase chain reaction techniques
- ____ 35. A technique that may be employed in the Human Genome Project is ____.
- PCR
 - automated gene sequencers
 - gel electrophoresis
 - all of these
- ____ 36. The Human Genome Project has involved sequencing and mapping the human genome. The most important benefit of this information has been the diagnosis of genetic disorders. Once a genetic disorder is diagnosed, ____ can be used as a possible treatment.
- PCR
 - gene therapy
 - DNA fingerprinting
 - cell cultures

- _____ 37. Which of the following would be an example of gene therapy technology?
- a. separation DNA fragments using gel electrophoresis
 - b. cutting DNA into fragments with restriction enzymes
 - c. development of a nasal spray that contains copies of the normal gene that is defective in persons with cystic fibrosis
 - d. modifying E. coli to produce indigo dye for coloring denim blue jeans
- _____ 38. The Human Genome Project may make use of which of the following to diagnose genetic disorders before birth?
- a. all of the above
 - b. PCR
 - c. cell cultures
 - d. gel electrophoresis
- _____ 39. An application of using DNA technology to help environmental scientists would be _____.
- a. clone the gene for human growth hormone to treat pituitary dwarfism
 - b. make transgenic bacteria that can be used to clean up oil spills more quickly than do the natural bacteria
 - c. create a tobacco plant that glows in the dark
 - d. use PCR to analyze DNA at a crime scene
- _____ 40. Gel electrophoresis is a technique used to _____.
- a. cut DNA into fragments of various sizes
 - b. clone chromosomes of various species
 - c. separate DNA fragments by charge and length
 - d. inject foreign DNA into animal and plant cells

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