

This print-out should have 25 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Raven16 26

001 10.0 points

The polymerase chain reaction commonly known as PCR includes which of the following steps?

1. primer extension with DNA polymerase
2. denaturation of primers and the DNA fragment to be amplified
3. annealing of primers to the complementary sequences on the DNA
4. repeating all steps in many cycles
5. All of these steps are included in PCR. **correct**

Explanation:

Raven16 32

002 10.0 points

Polymerase Chain Reactions (PCRs) involve three steps.

The correct order of those steps is

1. annealing of primers, primer extension, and denaturation.
2. denaturation, annealing of primers, and primer extension. **correct**
3. annealing of primers, denaturation, and primer extension.
4. denaturation, primer extension, and annealing of primers.
5. primer extension, annealing of primers, and denaturation.

Explanation:

Recomb DNA 02

003 10.0 points

The polymerase chain reaction is important because it allows us to

1. restrict eukaryotic gene
2. insert eukaryotic genes into prokaryotic plasmids, characterize it and transfer to other organisms
3. make DNA from RNA transcripts
4. incorporate genes into viruses
5. make many copies of DNA **correct**

Explanation:

Recall

Recomb DNA 03

004 10.0 points

A plasmid must have an origin of replication to allow it to replicate in *E.coli* independently of the chromosome and

1. incorporate genes into viruses
2. multiple cloning sites
3. a phage capable of infecting the *E.coli* bacterium
4. a selectable marker, usually antibiotic resistance **correct**
5. a tissue plasminogen activator

Explanation:

The antibiotic marker gene is necessary to eliminate bacteria that have failed to pick up plasmids.

RecombinantDNA and Biotechnology 05

005 10.0 points

DNA is _____ charged due to the presence of a _____ group.

1. negatively; carbon
2. positively; phosphate

3. negatively; phosphate **correct**

4. negatively; methyl

5. positively; methyl

Explanation:

**RecombinantDNA and Biotechnology 06
006 10.0 points**

DNA, because it has a _____ charge, moves to the _____ end of the field in gel electrophoresis; _____ DNA molecules migrate the most quickly.

1. positive; negative; smaller
2. positive; positive; smaller
3. negative; positive; smaller **correct**
4. positive; positive; larger
5. negative; positive; larger

Explanation:

**RecombinantDNA and Biotechnology 10
007 10.0 points**

Restriction enzymes cleave DNA at specific sequences by hydrolyzing

1. the 3' hydroxyl of one nucleotide and the 5' phosphate of the next one. **correct**
2. two phosphodiester linkages on the same strand.
3. at the 1' carbons to cleave the nitrogenous bases.
4. at the 2' carbons to cleave hydroxyl groups.
5. four phosphodiester linkages, two on each strand.

Explanation:

RecombinantDNA and Biotechnology 13

008 10.0 points

Which two methods are most often used in DNA fingerprinting?

1. Restriction digestion and gel electrophoresis **correct**
2. Homologous and antisense RNA recombination
3. Homologous recombination and the construction of gene libraries
4. Gel electrophoresis and creation of expression vectors
5. Pharming and phishing

Explanation:

**RecombinantDNA and Biotechnology 21
009 10.0 points**

The two enzymes that are most important in the construction of recombinant DNA are _____ and _____.

1. reverse transcriptase; DNA polymerase
2. cytochrome oxidase; DNA polymerase
3. restriction enzymes; ligase **correct**
4. restriction enzymes; reverse transcriptase
5. TPA; reverse transcriptase

Explanation:

**RecombinantDNA and Biotechnology 24
010 10.0 points**

EcoRI makes staggered cuts when it cleaves DNA, creating single-stranded tails called “sticky ends.” These ends can form a complementary base pair. In order for this to happen, which of the following conditions is necessary?

1. None of these

2. Methyl groups at each end
3. Low enough temperatures **correct**
4. The presence of specific helicases
5. High enough temperatures

Explanation:

RecombinantDNA and Biotechnology 26
011 10.0 points

Reporter genes are used in the construction of transgenics because they

1. contain recognition sites for restriction enzymes.
2. can replicate independently inside the host cell.
3. carry the DNA into host cells.
4. have an easily observed phenotype. **correct**
5. connect blunt-end fragments.

Explanation:

RecombinantDNA and Biotechnology 28
012 10.0 points

Yeasts are useful eukaryotic hosts for recombinant DNA studies because of their

1. All of these **correct**
2. None of these
3. rapid rate of cell division.
4. ease of growth in the laboratory.
5. small genome size.

Explanation:

RecombinantDNA and Biotechnology 29
013 10.0 points

Bacteria are not particularly useful hosts for studies of the expression of eukaryotic genes

because they

1. have a small genome size.
2. are totipotent.
3. lack the splicing machinery needed to remove introns from eukaryotic mRNA. **correct**
4. contain plasmids.
5. None of these

Explanation:

RecombinantDNA and Biotechnology 35
014 10.0 points

Which of the following makes plasmids useful as a vector?

1. Unlike viruses, plasmids do not need to be coaxed to infect cells by artificial means.
2. Many plasmids contain genes that convey antibiotic resistance. **correct**
3. All of these
4. Plasmids use the same origin of replication as eukaryotic cells.
5. Plasmids can accommodate a large amount of DNA.

Explanation:

RecombinantDNA and Biotechnology 39
015 10.0 points

A researcher inserts a DNA segment at the BamHI recognition site within a plasmid; this site is located within the tetracycline resistance gene. This plasmid also has a gene for ampicillin resistance. Following DNA transformation, the researcher must differentiate the bacteria that have taken up the recombinant DNA from those that have taken up either the foreign DNA only or intact plasmids. In doing so, the researcher should select the bacteria that

1. will grow on ampicillin but are sensitive to tetracycline. **correct**
2. are sensitive to both antibiotics.
3. will grow on tetracycline but are sensitive to ampicillin.
4. are resistant to both antibiotics.
5. grow only on an enriched medium.

Explanation:

Raven16 12
016 10.0 points

Since the single stranded ends created by restriction enzymes are complementary to each other, they can be joined together

1. even though the source of the DNA is the same.
2. only if the subunits have been methylated.
3. but the “sticky ends” will most likely have to be modified.
4. but the hybridization of the two ends may cause a problem with cloning.
5. even though the source of the DNA is different. **correct**

Explanation:

Starr 16 14
017 10.0 points

Craig Venter accelerated the pace of the Human Genome Initiative by

1. using ESTs (expressed sequence tags) to locate genes.
2. inventing automated DNA sequencing.
3. the shotgun approach. **correct**

4. using gel electrophoresis to detect gene variations.

5. searching for sequences that resemble chimpanzee genes.

Explanation:

Starr 16 17
018 10.0 points

DNA fragments from an organism’s genome are labeled with a modified nucleotide sequence that fluoresces a certain color in

1. automated DNA sequencing. **correct**
2. DNA fingerprinting.
3. gene therapy.
4. the creation of a cDNA.

Explanation:

GA SB2 29
019 10.0 points

A transgenic animal is defined as an animal that

1. contains a gene from another living organism. **correct**
2. had a genetic disorder that has been repaired.
3. is the first of its kind to reproduce asexually.
4. has been mutated by a mutagenic factor like X-rays or other chemicals.
5. contains heterozygous genes from both parents.

Explanation:

Transgenic animals have been given another gene from a different organism (trans is the root word for across, so moving genes across organisms).

020 10.0 points

Genetic engineering has been used to

1. modify farm animals.
2. improve crop plants.
3. clone animals.
4. All of these **correct**

Explanation:

Starr 16 01
021 10.0 points

Gene therapy is

1. the cutting and splicing of DNA from different species.
2. a way of analyzing differences in DNA sequence among individuals.
3. None of these
4. All of these
5. the transfer of one or more genes into an individual to correct a genetic defect or boost resistance to disease. **correct**

Explanation:

Raven16 28
022 10.0 points

When electrical current is applied during a gel electrophoresis procedure, the DNA fragments are separated by

1. enzyme binding activity sites.
2. the number of poly-A tails associated with each one.
3. their size. **correct**
4. their response to the staining chemicals used during the procedure.
5. their electrical charge.

Explanation:

DNA is negative; so charge does not matter during. The size of fragments determine how far they would migrate in the gel; the larger the fragments the slower the movement.

Raven16 42
023 10.0 points

The DNA of somatic cells is constantly bombarded with agents from the environment that could cause mutations.

Somatic cells can withstand such a phenomenon because they are

1. able to withstand the mutations that might be induced since there are so many cell cycles in a somatic cell's life and the mutation effects will be diluted.
2. much tougher than gametes and can reduce their exposure to environmental agents that might cause mutations to occur.
3. not passed on to the next generation; thus, the mutations that occur are kept within the organism. **correct**
4. sufficiently shielded by a polysaccharide coat which prevents harmful agents from entering the cell, unlike gametes, which are exposed.
5. found in the various organs of organisms and are shielded from the harmful agents that might cause mutations.

Explanation:

Raven17 35
024 10.0 points

The sequencing method that cuts the DNA of an entire chromosome into small fragments and then clones these fragments is called

1. consensus sequencing.
2. restriction fragment length polymorphism.
3. the clone-by-clone sequencing method.

4. the shotgun method of sequencing. **correct**

5. RFLP sequencing.

Explanation:

StarrW 15 08

025 10.0 points

Automated DNA sequencing relies on

1. All of these **correct**

2. supplies of standard and labeled nucleotides.

3. primers and DNA polymerases.

4. gel electrophoresis and a laser beam.

Explanation: