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. denaturation of primers and the DNA fragment to be amplified

2. primer extension with DNA polymerase

3. anealing 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.

Raven16 32
002 10.0 points

Polymerase Chain Reactions (PCRs) involve three steps.

The correct order of those steps is

1. primer extension, annealing of primers, and denaturation.

2. denaturation, primer extension, and annealing of primers.

3. denaturation, annealing of primers, and primer extension.

4. annealing of primers, denaturation, and primer extension.

5. annealing of primers, primer extension, and denaturation.

Recomb DNA 02
003 10.0 points

The polymerase chain reaction is important because it allows us to

1. incorporate genes into viruses

2. restrict eukaryotic gene

3. insert eukaryotic genes into prokaryotic plasmids, characterize it and transfer to other organisms

4. make DNA from RNA transcripts

5. make many copies of DNA

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. a phage capable of infecting the *E.coli* bacterium

3. a selectable marker, usually antibiotic resistance

4. a tissue plasminogen activator

5. multiple cloning sites

RecombinantDNA and Biotechnology 05
005 10.0 points

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

1. positively; phosphate

2. positively; methyl

3. negatively; phosphate

4. negatively; methyl

5. negatively; carbon

RecombinantDNA and Biotechnology 06
006 10.0 points

DNA, because it has a _____ charge, moves to the _____ end of the field in gel electrophore-

sis; _____ DNA molecules migrate the most quickly.

1. positive; negative; smaller

2. positive; positive; larger

3. negative; positive; larger

4. negative; positive; smaller

5. positive; positive; smaller

RecombinantDNA and Biotechnology 10
007 10.0 points

Restriction enzymes cleave DNA at specific sequences by hydrolyzing

1. at the 1' carbons to cleave the nitrogenous bases.

2. the 3' hydroxyl of one nucleotide and the 5' phosphate of the next one.

3. two phosphodiester linkages on the same strand.

4. four phosphodiester linkages, two on each strand.

5. at the 2' carbons to cleave hydroxyl groups.

RecombinantDNA and Biotechnology 13
008 10.0 points

Which two methods are most often used in DNA fingerprinting?

1. Homologous recombination and the construction of gene libraries

2. Homologous and antisense RNA recombination

3. Pharming and phishing

4. Gel electrophoresis and creation of expression vectors

5. Restriction digestion and gel electrophoresis

RecombinantDNA and Biotechnology 21
009 10.0 points

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

1. TPA; reverse transcriptase

2. restriction enzymes; ligase

3. restriction enzymes; reverse transcriptase

4. cytochrome oxidase; DNA polymerase

5. reverse transcriptase; DNA polymerase

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. Methyl groups at each end

2. Low enough temperatures

3. The presence of specific helicases

4. High enough temperatures

5. None of these

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. connect blunt-end fragments.

3. can replicate independently inside the host cell.

4. carry the DNA into host cells.

5. have an easily observed phenotype.

RecombinantDNA and Biotechnology 28
012 10.0 points

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

1. None of these

2. rapid rate of cell division.

3. ease of growth in the laboratory.

4. All of these

5. small genome size.

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. contain plasmids.

3. are totipotent.

4. None of these

5. lack the splicing machinery needed to remove introns from eukaryotic mRNA.

RecombinantDNA and Biotechnology 35
014 10.0 points

Which of the following makes plasmids useful as a vector?

1. Plasmids can accommodate a large amount of DNA.

2. All of these

3. Many plasmids contain genes that convey antibiotic resistance.

4. Unlike viruses, plasmids do not need to be coaxed to infect cells by artificial means.

5. Plasmids use the same origin of replication as eukaryotic cells.

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. are resistant to both antibiotics.

2. are sensitive to both antibiotics.

3. grow only on an enriched medium.

4. will grow on tetracycline but are sensitive to ampicillin.

5. will grow on ampicillin but are sensitive to tetracycline.

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. only if the subunits have been methylated.

2. but the "sticky ends" will most likely have to be modified.

3. even though the source of the DNA is different.

4. even though the source of the DNA is the same.

5. but the hybridization of the two ends may cause a problem with cloning.

Starr 16 14
017 10.0 points

Craig Venter accelerated the pace of the Human Genome Initiative by

1. using gel electrophoresis to detect gene variations.

2. the shotgun approach.

3. searching for sequences that resemble chimpanzee genes.

4. inventing automated DNA sequencing.

5. using ESTs (expressed sequence tags) to locate genes.

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. gene therapy.

2. the creation of a cDNA.

3. automated DNA sequencing.

4. DNA fingerprinting.

GA SB2 29
019 10.0 points

A transgenic animal is defined as an animal that

1. has been mutated by a mutagenic factor like X-rays or other chemicals.

2. contains heterozygous genes from both parents.

3. had a genetic disorder that has been repaired.

4. is the first of its kind to reproduce asexually.

5. contains a gene from another living organism.

Holt Bio 11 11
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

Starr 16 01
021 10.0 points

Gene therapy is

1. a way of analyzing differences in DNA sequence among individuals.

2. the transfer of one or more genes into an individual to correct a genetic defect or boost resistance to disease.

3. None of these

4. All of these

5. the cutting and splicing of DNA from different species.

Raven16 28
022 10.0 points

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

1. their size.

2. their response to the staining chemicals

used during the procedure.

3. the number of poly-A tails associated with each one.

4. enzyme binding activity sites.

5. their electrical charge.

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. much tougher than gametes and can reduce their exposure to environmental agents that might cause mutations to occur.

2. sufficiently shielded by a polysaccharide coat which prevents harmful agents from entering the cell, unlike gametes, which are exposed.

3. not passed on to the next generation; thus, the mutations that occur are kept within the organism.

4. 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.

5. found in the various organs of organisms and are shielded from the harmful agents that might cause mutations.

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. the shotgun method of sequencing.

2. consensus sequencing.

3. restriction fragment length polymorphism.

4. RFLP sequencing.

5. the clone-by-clone sequencing method.

StarrW 15 08
025 10.0 points

Automated DNA sequencing relies on

1. gel electrophoresis and a laser beam.

2. primers and DNA polymerases.

3. supplies of standard and labeled nucleotides.

4. All of these