This print-out should have 34 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Raven18 33
001   10.0 points

What is a bacterial gene regulatory system *not* likely to have?

1. a ribosome recognition site

2. a coding sequence

3. an operator

4. one or more introns **correct**

5. a promoter

Explanation:
Prokaryotic genomes do not contain introns.

Raven20 41
002   10.0 points

In bacteria, genes may be transferred through a pilus which acts like a bridge in which process?

1. transfection

2. transformation

3. inversion

4. recombination

5. conjugation **correct**

Explanation:
Recall

Starr 15 01
003   10.0 points

In the lactose operon of *E.coli* , the operators

1. releases the repressor protein.

2. are binding sites for RNA polymerase.

3. encode the repressor protein.

4. bind the repressor protein. **correct**

5. encode enzymes that break down lactose.

Explanation:
Recall

Starr 16 03
004   10.0 points

A plasmid is

1. a bacterial chromosome.

2. a small circular molecule of DNA with only a few genes besides the chromosomal DNA. **correct**

3. a linear fragmentory DNA.

4. found only in eukaryotes.

5. a collection of DNA fragments produced by restriction enzymes.

Explanation:
Recall

Viruses and Prokaryotes34
005   10.0 points

In transduction,

1. only a particular part of the bacterial chromosome can be transferred.

2. None of these

3. only the F plasmid can be transferred.

4. only the part of the bacterial chromosome near the F plasmid can be transferred.

5. a part of the bacterial chromosome may be transferred. **correct**

Explanation:

Viruses and Prokaryotes41

006　10.0 points

Genetic diversity is introduced into bacterial populations through

1. transduction.

2. conjugation.

3. transformation.

4. All of these **correct**

5. the acquisition of new genes via plasmids and transposable elements.

Explanation:

Viruses and Prokaryotes42
007　10.0 points

The most efficient means of regulating protein synthesis is by

1. translation of the mRNA.

2. selective blocking of transcription. **correct**

3. degradation of the protein.

4. inhibition of the protein.

5. transcription of the gene.

Explanation:

Viruses and Prokaryotes46
008　10.0 points

A promoter is the region of

1. the mRNA that binds tRNAs.

2. None of these

3. DNA that binds RNA polymerase. **correct**

4. plasmid that binds the enzymes for replication.

5. the mRNA that binds to a ribosome.

Explanation:

Viruses and Prokaryotes48
009　10.0 points

The three basic parts of an operon are the

1. None of these

2. promoter, the mRNA, and the termination codons.

3. structural gene(s), the mRNA, and the tRNAs.

4. promoter, the structural gene(s), and the termination codons.

5. promoter, the operator, and the structural gene(s). **correct**

Explanation:

Viruses and Prokaryotes50
010　10.0 points

The mechanism by which the inducer causes the repressor to detach from the operator is an example of

1. recombination.

2. transcription.

3. transposition.

4. catabolite repression.

5. allosteric modification. **correct**

Explanation:

Viruses and Prokaryotes52
011　10.0 points

An inducer

1. combines with a repressor and prevents it from binding the operator. **correct**

2. binds to the promoter and prevents the repressor from binding to the operator.

3. binds to the operator and prevents the repressor from binding at this site.

4. combines with a repressor and prevents it from binding the promoter.

5. binds to the termination codons and allows protein synthesis to continue.

Explanation:

Viruses and Prokaryotes54
012   10.0 points

Which operon is turned "off" in response to molecules present in the environment of the cell?

1. Repressible **correct**

2. Impressible

3. Inducible

4. Degraded

5. Suppressible

Explanation:

Viruses and Prokaryotes55
013   10.0 points

In a repressible operon, the repressor molecule

1. can repress the transcription of the operon on its own.

2. is a molecule made from the operon.

3. must first be made negative to control the operon.

4. binds to the mRNA.

5. must first be activated by a corepressor. **correct**

Explanation:

Viruses and Prokaryotes56
014   10.0 points

It is found that a certain enzyme is synthesized whenever the solution in which the cells are growing lacks substance X. This phenomenon is most likely an example of _____ gene regulation.

1. inducible

2. repressible **correct**

3. negative

4. positive

5. positive-negative

Explanation:

Viruses and Prokaryotes57
015   10.0 points

It is found that a certain enzyme is synthesized whenever the solution in which the cells are growing contains substance X. This phenomenon is most likely an example of

1. repressible gene regulation.

2. inducible gene regulation. **correct**

3. negative gene regulation.

4. positive gene regulation.

5. positive-negative gene regulation.

Explanation:

Raven26 12
016   10.0 points

The genetic alteration of a cell's genome by introduction of foreign DNA is called

1. alternation of generation.

2. reproduction.

3. transformation. **correct**

4. transfection.

5. syngamy.

Explanation:
Recall

Viruses and Prokaryotes60
017   10.0 points
How are inducible and repressible systems similar?

1. They both control catabolic pathways.

2. In both systems the regulatory molecules function by binding to the operator. **correct**

3. Both systems are unique to prokaryotes.

4. They both control biosynthetic pathways.

5. They both block transcription.

Explanation:

Viruses and Prokaryotes64
018   10.0 points
What effect does the presence of ample glucose have on the amount of lac operon transcription?

1. It increases the rate of transcription.

2. It increases the cAMP concentration, which in turn causes a decreased rate of transcription.

3. It decreases the cAMP concentration, which in turn causes an increased rate of transcription.

4. None of these

5. It decreases the rate of transcription. **correct**

Explanation:

Eukaryotic Genome 01

019   10.0 points
Cheetahs are very susceptible to disease because

1. they have many mutated genes.

2. they have many more regulatory proteins compared to prokaryotes.

3. they have very large genomes compared to prokaryotes.

4. they lack genetic diversity. **correct**

5. much of their DNA is noncoding.

Explanation:

Eukaryotic Genome 14
020   10.0 points
The similarity between the human genome and the genome of the puffer fish indicates that

1. chromosomal rearrangements account for phenotypic differences.

2. alternative splicing may be a key to the levels of complexity in organisms.

3. humans and puffer fish have a large amount of repetitive DNA.

4. the complexity of an organism is not determined by genes alone. **correct**

5. there are more human mRNAs than human genes.

Explanation:

Raven11 48
021   10.0 points
Histones are proteins that

1. are tightly bound to mRNA.

2. serve as spindle fibers to pull sister chromatids apart during anaphase.

3. are tightly bound to inside of the nuclear membrane.

4. are tightly bound to the double strands of DNA. **correct**

5. are tightly bound with only one of the strands of DNA.

Explanation:
Recall

StarrC 08 05
022   10.0 points
A chromosome consists of DNA wrapped around which of the following?

1. nucleic acids

2. lipids

3. carbohydrates

4. lysosomes

5. proteins **correct**

Explanation:
This cylindrical fiber is called a solenoid. It consists of DNA wrapped around histone proteins.

Eukaryotic Genome 29
023   10.0 points
In eukaryotic cells, promoters are

1. transcribed.

2. sequences of RNA that are spliced out.

3. transcribed and then removed.

4. transcribed and translated.

5. neither transcribed nor translated. **correct**

Explanation:

Eukaryotic Genome 52
024   10.0 points

Transcription factors are

1. factors that bind to enhancers.

2. proteins that bind to DNA near the promoter sequence. **correct**

3. DNA sequences that regulate transcription.

4. RNA sequences that bind to RNA polymerase.

5. polysaccharides that bind to the transcripts.

Explanation:

Eukaryotic Genome 68
025   10.0 points
Nucleosomes disaggregate to allow transcription and then reaggregate

1. by attaching ubiquitin.

2. by acetylation and deacetylation. **correct**

3. through alternation of nucleotides.

4. through alternative splicing.

5. through insertion of nucleotides.

Explanation:

Eukaryotic Genome 77
026   10.0 points
In neurons, the globin gene contains many methylated cytosines. The globin gene, therefore, is

1. expressed only in females.

2. regulated by posttranscriptional control.

3. regulated by posttranslational control.

4. not expressed. **correct**

5. expressed only in males.

Explanation:

Eukaryotic Genome 82
027   10.0 points

The expression of some genes can be regulated in part by the pattern of RNA splicing. This is an example of

1. DNA methylation.

2. posttranscriptional control. **correct**

3. transcriptional regulation.

4. catalytic RNA activity.

5. the endosymbiotic theory.

Explanation:

Eukaryotic Genome 89
028   10.0 points

Some metabolic pathways are regulated in part by changes in the rate of degradation of key enzymes. This is an example of

1. operon control.

2. feedback inhibition.

3. transcriptional control.

4. posttranslational control. **correct**

5. liquid hybridization.

Explanation:

GA SB2 13
029   10.0 points

Some mammals have genes for fur color that produce pigment only when the outside air is above a certain temperature. This effect on pigment production is an example of how the environment can

1. stop the process of evolution.

2. destroy sensitive genes.

3. influence the expression of genes. **correct**

4. cause new mutations to occur.

Explanation:
   Gene expression is often influenced by environmental factors.

Raven18 12
030   10.0 points

Transcriptional control-proteins increase the rate of transcription by binding to what part of DNA?

1. tRNA sequences

2. enhancer sequences **correct**

3. operator sequences

4. promotor sequences

5. mRNA sequences

Explanation:
   Recall

Raven18 24
031   10.0 points

Which statement(s) concerning transcriptional control is/are true?
A. RNA polymerase must have access to the DNA helix;
B. Proteins binding at other regions on the DNA affect the binding of RNA polymerase to the promoter positively or negatively;
C. RNA polymerase must be capable of binding to the gene's promoter.

1. B only

2. C only

3. All are true. **correct**

4. A only

5. None is true.

Explanation:

Raven18 35
032   10.0 points

The *lac* regulatory system is important to bacteria because the sugar lactose

1. switches the system off and on whether or not lactose is present.

2. is the most common source of food; regulatory enzymes are needed all of the time.

3. cannot be made by bacteria unless the genes are turned on.

4. is incorporated into the nucleic acid of the bacteria.

5. is only rarely available; producing enzymes all of the time is costly. **correct**

Explanation:
Recall

Raven18 36
033   10.0 points

Small RNAs can regulate gene expression.
One type called microRNA (miRNA) acts by binding

1. directly to the ribosomes, thus preventing transcription.

2. indirectly to the tRNAs, thus preventing codon and anti-codon binding.

3. directly to the template DNA strand, thus preventing mRNA production.

4. directly to the tRNAs, thus preventing their transport of amino acids to the ribosomes.

5. directly to the mRNAs, thus preventing their translation into proteins. **correct**

Explanation:

Recall

Starr 15 09
034   10.0 points

Which statement is correct?

1. Gene amplification allows your white blood cells to make millions of different antibodies.

2. During differentiation, cell lineages activate a fraction of their genes in selective ways. **correct**

3. Transcription of genes takes place with or without a promoter.

4. A transcript's stability affects the rate at which it is transcribed.

5. Methylation is necessary to activate a gene.

Explanation:
Recall