

BIOLOGY

1. BIOLOGY

Writer: American Heritage

Toss Up: Multiple Choice

To which hormone do Leydig cells respond to by producing testosterone?

- W) LH
- X) FSH
- Y) ACTH
- Z) Oxytocin

Toss Up Answer: W

Bonus: Multiple Choice

A man goes to a doctor complaining of infertility. After running some tests, the doctor determines that the man has normal hormone levels, but the sperm he produces are dying before reaching maturity due to inadequate nourishment. Which of the following kinds of cells is mostly likely responsible for his infertility?

- W) Leydig cells
- X) Sertoli cells
- Y) Peritubular myoid cells
- Z) Germ cells

Bonus Answer: X

2. BIOLOGY

Writer: American Heritage

Toss Up: Short Answer

Name the only one of the 20 basic amino acids to contain an indole functional group.

Bonus Answer: Tryptophan

Bonus: Short Answer

Which enzyme in the energy investment phase of glycolysis is allosterically regulated in a negative feedback loop?

Bonus Answer: Phosphofructokinase

3. BIOLOGY

Writer: American Heritage

Toss Up: Multiple Choice

Which of the following molecules comes first in the citric acid cycle?

- W) α -Ketoglutarate
- X) Succinyl-CoA
- Y) Malate
- Z) Isocitrate

Toss Up Answer: Z

Bonus: Short Answer

When it occurs in the cell, the citric acid cycle typically produces what energy rich molecule besides ATP, NADH, and FADH₂?

Bonus Answer: GTP

4. BIOLOGY

Writer: Stuyvesant

Toss Up: Short Answer

In eukaryotes, which enzyme proofreads while DNA replication takes place?

Bonus Answer: DNA Polymerase (accept DNA Polymerase III)

Bonus: Short Answer

What is the general name for a point mutation in which a single nucleotide change results in a codon that codes for a different amino acid?

Bonus Answer: Missense Mutation

5. BIOLOGY

Writer: Stuyvesant

Toss Up: Multiple Choice

Modern research has shown that silent mutations can be harmful in all of the following ways except:

- W) Causing a short pause during codon-anticodon pairing in translation
- X) Reducing the stability of the mRNA's 3D structure
- Y) Causing improper splicing of the primary transcript
- Z) Slowing the rate of transport of mRNA across the nuclear membrane

Toss Up Answer: Z

Bonus: Short Answer

What was the first codon-amino acid pair to be identified? (Give both the codon and the amino acid)

Bonus Answer: UUU and phenylalanine

6. BIOLOGY

Writer: Stuyvesant

Toss Up: Short Answer

Which amino acid would constitute a disulfide bridge?

Bonus Answer: Cysteine

Bonus: Short Answer

What is the name of the cellular machinery that removes introns?

Bonus Answer: Spliceosome

7. BIOLOGY

Writer: Centennial

Toss Up: Short Answer

Name all of the following that are usually characteristics of monocots: (1) Petals in multiples of three, (2) taproot present, (3) vascular bundles arranged in a ring, (4) parallel veins

Bonus Answer: (1) Petals in multiples of three, and (4) parallel veins

Bonus: Short Answer

Name all of the following that are monocots: corn, crabgrass, red bean

Bonus Answer: Corn and crabgrass

8. BIOLOGY

Writer: Centennial

Toss Up: Short Answer

Which subunit of Na⁺/K⁺-ATPase binds the Na⁺ ion?

Bonus Answer: The alpha subunit

Bonus: Multiple Choice

Which of the following effects would a toxin that blocked voltage-gated potassium channels be most likely to cause?

- W) A decrease in the strength of the action potential
- X) A decrease in the length of the refractory period
- Y) An increase in the speed of the action potential
- Z) An increase in the strength of the action potential

Bonus Answer: Z

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9. BIOLOGY

Writer: Granada Hills

Toss Up: Multiple Choice

The organ that produces glucagon is under what organ-system?

- W) Musculo-Skeletal
- X) Nervous
- Y) Endocrine
- Z) Circulatory

Toss Up Answer: Z

Bonus: Short Answer

Most pharmaceutical insulin is produced using what species of bacteria?

Bonus Answer: E. Coli

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10. BIOLOGY

Writer: Granada Hills

Toss Up: Multiple Choice

What part of the brain controls the ability to understand speech?

- W) Olfactory
- X) Frontal
- Y) Broca's Area
- Z) Wernicke's Area

Toss Up Answer: Z

Bonus: Short Answer

Which neural tissue facilitates neural messages from the left to the right hemispheres?

Bonus Answer: Corpus Callosum

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11. BIOLOGY

Writer: Granada Hills

Toss Up: Multiple Choice

One mantis shrimp has how many more sets of photoreceptors than one dog?

- W) 2

X) 4

Y) 14

Z) 27

Toss Up Answer: Y

Bonus: Short Answer

By name or number, name all of the following species that produce insulin in the Brockmann body.

I) Salmon

II) Chimpanzee

III) Horse

IV) Tilapia

V) Octopus

Bonus Answer: I and IV only

12. BIOLOGY

Writer: Granada Hills

Toss Up: Short Answer

Red-green color blindness is a sex-linked recessive disorder. If a color blind father has children with a carrier mother, what percentage of their daughters should be red-green colorblind?

Bonus Answer: 25%

Bonus: Short Answer

Shaggy fur is dominant over straight fur and white fur is dominant over brown fur. If a hamster with straight, white (homozygous) fur is mated with a heterozygous shaggy, white hamster, what percentage of their offspring should have straight, white fur?

Bonus Answer: 50%

13. BIOLOGY

Writer: Centennial

Toss Up: Short Answer

What is the name for the vessel network that supplies the large blood vessels?

Bonus Answer: vasa vasorum

Bonus: Short Answer

Order the following sinuses in the human skull from superior to inferior: maxillary, frontal, ethmoid

Bonus Answer: Frontal, ethmoid, maxillary

14. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

What is the name of the enzyme that makes ATP from ADP and inorganic phosphate?

Bonus Answer: ATP synthase

Bonus: Short Answer

What is the result of an extra chromosome 21, so that each body cell has a total of 47 chromosomes?

Bonus Answer: Down Syndrome/trisomy 21

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15. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

What is the largest venomous organism?

Bonus Answer: Komodo Dragon (or Komodo Monitor)

Bonus: Multiple Choice

What composes marine snow?

- W) Discarded manmade products like plastics
- X) Light as it passes through the photic zones in a body of water
- Y) Organic matter such as waste and dead cells
- Z) Sulfides and other minerals ejected from hydrothermal vents

Bonus Answer: Y

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16. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

In which phase of meiosis are the chromosomes pulled apart?

- W) Anaphase 1
- X) Prophase 1
- Y) Anaphase 2
- Z) Metaphase

Toss Up Answer: W

Bonus: Short Answer

In what types of organisms does meiosis occur?

Bonus Answer: Eukaryote

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