

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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17. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

Chlorophyll is a naturally occurring chelate compound in which central metal is

- W) Copper
- X) Magnesium
- Y) Iron
- Z) Calcium

Toss Up Answer: X

Bonus: Multiple Choice

Pollination by birds is called:

- W) autogamy
- X) ornithophily (pron: or-nith-o-philly)
- Y) entomophily (pron: ent-eh-mof-illy)
- Z) anemophily (pron: an-eh-mof-illy)

Bonus Answer: X

18. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

If an organism has a haploid number of 28, how many chromosomes does it have?

- W) 14
- X) 28
- Y) 42
- Z) 56

Toss Up Answer: Z

Bonus: Multiple Choice

Cellular respiration in the absence of oxygen is called fermentation. What is the product of fermentation in animal cells?

- W) Acetyl-CoA
- X) alcohol
- Y) carbon dioxide
- Z) lactic acid

Bonus Answer: Z

19. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

If one parent has an autosomal dominant disease, what is the chance of the offspring having the same disease?

- W) 25%
- X) 75%
- Y) 50%
- Z) 100%

Toss Up Answer: Y

Bonus: Short Answer

What is osteomalacia?

Bonus Answer: the softening of bones

20. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

Name the two tests a pregnant woman can take to determine any genetic diseases the baby will have.

Bonus Answer: -Amniocentesis
-Chorionic Villus Sampling

Bonus: Short Answer

What are the 3 parts of a nucleotide?

Bonus Answer: Nitrogenous base, 5 carbon Pentose sugar, phosphate group.

21. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

What enzyme is responsible for "unzipping" the DNA strand during replication?

- W) DNA helicase
- X) DNA ligase
- Y) DNA polymerase
- Z) RNA primase

Toss Up Answer: W

Bonus: Multiple Choice

Which macromolecule can be formed using the sugars produced by plants during photosynthesis?

- W) cellulose
- X) DNA
- Y) lipid
- Z) protein

Bonus Answer: W

22. BIOLOGY

Writer: Great Neck South

Toss Up: Multiple Choice

Which of the following structures prevents the passive flow of water and solutes into the stele of a tracheophyte?

- W) Endodermis
- X) Pericycle
- Y) Casparian Strip
- Z) Pith

Toss Up Answer: Y

Bonus: Short Answer

Which structure in the cell does protein modification last occur before exocytosis?

Bonus Answer: Golgi apparatus

23. BIOLOGY

Writer: Lakeside

Toss Up: Short Answer

Name the ground tissue in a leaf that is sandwiched between the epidermal layers and is split into sections named palisade and spongy.

Bonus Answer: MESOPHYLL

Bonus: Short Answer

Plants such as grasses are able to continue growing vertically after have their tops cut off because of the presence of which plant organ?

Bonus Answer: AXILLARY MERISTEMS

24. BIOLOGY

Writer: Lakeside

Toss Up: Short Answer

Which well-known transcription factor, named for its size, is activated by DNA damage and serves to halt the cell cycle?

Bonus Answer: p53

Bonus: Short Answer

The transition from mitosis to interphase is regulated by the compound cyclin D, which is degraded. What process regulates the degradation of cyclin D via proteasomes?

Bonus Answer: UBIQUITINATION

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25. BIOLOGY

Writer: Lakeside

Toss Up: Short Answer

In 1990, Michael Menaker conducted an experiment using hamsters with mutations that changed their circadian rhythms to observe the effects on which part of the hypothalamus?

Bonus Answer: SUPERCHIASMATIC NUCLEUS (Accept: SCN)

Bonus: Short Answer

Which disease is characterized by neurofibrillary tangles made up primarily of the tau protein?

Bonus Answer: ALZHEIMER'S DISEASE

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26. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

Which of the following is a disease extracted from deer ticks, also known as *Borrelia burgdorferi*?

Bonus Answer: Lyme disease, or borreliosis

Bonus: Short Answer

What brain-eating illness is obtained from eating other humans, very similar to Mad Cow disease?

Bonus Answer: Kuru

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27. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

What element is needed for the creation of thyroid hormones?

Bonus Answer: Iodine

Bonus: Short Answer

Name one thyroid hormone.

Bonus Answer: thyroxine/ triiodothyronine

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28. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

Who created amino acids using a model of earth's early environment?

W) Charles Darwin

X) Robert Hooke

Y) Stanley Miller

Z) Francis Crick

Toss Up Answer: Y

Bonus: Short Answer

What is the scientific name of spiny sea urchin?

Bonus Answer: Strongylocentrotus droebachiensis

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29. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Short Answer

What is the name of the family white-tailed deer, elk, and moose belong to?

Bonus Answer: Cervidae

Bonus: Multiple Choice

in which of these species of deer do antlers grow on both genders?

W) Reindeer

X) White-tailed deer

Y) Fallow deer

Z) All of the previously mentioned species have antlers on both genders

Bonus Answer: W

30. BIOLOGY

Writer: Brooklyn Tech

Toss Up: Multiple Choice

What does DNA code for?

W) Acid mine

X) Amino acids

Y) Glucose

Z) Apple Pie

Toss Up Answer: X

Bonus: Short Answer

Who created the idea of evolution?

Bonus Answer: Who created the idea of evolution?

31. BIOLOGY

Writer: Venice

Toss Up: Short Answer

In a human heart, what structure does blood enter after leaving the left ventricle?

Bonus Answer: AORTA

Bonus: Short Answer

What is the name for the circulatory adaptation found in many marine mammals, such as the grey whale and dolphin, that allows them to conserve heat using parallel blood vessels flowing in opposite directions such as the extremities of the animal?

Bonus Answer: COUNTERCURRENT HEAT EXCHANGE (ALSO ACCEPT: COUNTERCURRENT EXCHANGE)

32. BIOLOGY

Writer: Venice

Toss Up: Multiple Choice

What is the name for the clear cell wall made of silicon dioxide and water that is found in diatoms?

W) Frustule

X) Lamella

Y) Xylanes

Z) Pseudomurein

Toss Up Answer: W

Bonus: Multiple Choice

Which major group of diatoms is motile?

W) Coscinodiscophyceae

X) Elusimicrobiaceae

Y) Thaumarchaeota

Z) Bacillariophyceae

Bonus Answer: Z

33. BIOLOGY

Writer: Venice

Toss Up: Short Answer

Imperfect fungi propagate by what mode of reproduction?

Bonus Answer: ASEXUAL

Bonus: Multiple Choice

What do the hyphae [HY-fee] of coenocytic [see-no-SI-tic] fungi lack?

W) Lipid bodies

X) Haustoria

Y) Septa

Z) Multiple nuclei

Bonus Answer: Y
