BIOLOGY

1. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

Which of the following are classified as Type III hypersensitivity? (Note more than one answer may apply.)

I. Systemic Lupus Erythematosus

II. Farmer's lung

III. Erythroblastosis fetalis

IV. Glomerulonephritis

Bonus Answer: I, II, and IV

Accept: Systemic Lupus Erythematosus, Erythroblastosis fetalis, Glomerulonephritis

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Bonus: Multiple Choice

Erythroblastosis fetalis can kill the baby in any pregnancy of the mother but the first. This fatal condition occurs when

W) The mother is Rh(-) and the fetus from her first pregnancy is Rh(-)

X) The mother is Rh(-) and the fetus from her first pregnancy is Rh(+)

Y) The mother is Rh(+) and the fetus from her first pregnancy is Rh(-)

Z) The mother is Rh(+) and the fetus from her first pregnancy is Rh(+)

Bonus Answer: X

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2. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Which of the following is a bacteriostatic antibiotic that works by disrupting protein synthesis?

W) Erythromycin

X) Penicillin

Y) Trimethoprim

Z) Nalidixic acid

Toss Up Answer: W

Bonus: Multiple Choice

In India, during a cholera epidemic of 1926, European men poured a treatment for cholera into village wells unbeknownst to the villagers. What was the treatment?

W) Alcohol

X) antibiotics

Y) Phages

Z) Iodine

Bonus Answer: Y

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3. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

One day you see the headline on a tabloid and it says: “BACTERIA ARE EATING MY FACE.” The species of bacteria that most commonly causes the condition (necrotizing fasciitis) sensationalized above is:

W) Staphylococcus aureus

X) Streptococcus agalactiae

Y) Staphylococcus epidermis
Z) Streptococcus pyogenes
Toss Up Answer: Z

Bonus: Short Answer
Staphylococcus aureus produces many enzymes that contribute to its virulence. It produces an enzyme that breaks down an acid crucial to the structural integrity of tissues. This acid is:
Bonus Answer: Hyaluronic acid (accept: Hyaluronic)

==========

4. BIOLOGY

Writer: Jason Mohabir
Toss Up: Multiple Choice
Stabilization of the unique coiled structure of an alpha helix in a protein is primarily attributed to:
W) disulfide bridges between cysteine side chains
X) carbohydrate moieties attached to polar amino acids
Y) peptide linkages that covalently bond amino acids
Z) an abundance of amino acids with electrically charged side chains

Toss Up Answer: Z

Bonus: Multiple Choice
Histidine is degraded to α-ketoglutarate and is described as a:
W) gluco amino acid
X) glucogenic amino acid
Y) ketogenic amino acid
Z) keto-gluco amino acid

Bonus Answer: X

==========

5. BIOLOGY

Writer: Jason Mohabir
Toss Up: Multiple Choice

A person with phenylketonuria cannot convert:
W) phenylalanine to tyrosine
X) phenylalanine to isoleucine
Y) phenol into ketones
Z) phenylalanine to lysine
Toss Up Answer: W

Bonus: Short Answer
In the normal breakdown of phenylalanine, it is initially degraded to:
Bonus Answer: Tyrosine

==========

6. BIOLOGY

Writer: Jason Mohabir
Toss Up: Multiple Choice
The phospholipids present in cytoplasm membrane of the archaeo-bacteria is:
W) phosphoglycerides
X) polyisoprenoid

Y) polyisoprenoid branched chain lipids
Z) none of the above

Toss Up Answer: Y

Bonus: Multiple Choice

The phospholipids present in cytoplasm membrane of eubacteria is mainly:
W) phosphoglycerides
X) polyisoprenoid
Y) phospholipoprotein
Z) none of these

Bonus Answer: W

==========

7. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Which were the investigators lived at the same time?
W) Koch and Pasteur
X) Darwin and Woese
Y) Van Leeuenhoek and Ricketts
Z) Berg and Hooke

Toss Up Answer: W

Bonus: Short Answer

The third founder of microbiology, Ferdinand Cohn, classified bacteria by shape. This system is still used today. Name three shapes of bacteria.

Bonus Answer: Three of these: sphericals, short rods [rod], threads, and spirals

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8. BIOLOGY

Writer: Jason Mohabir

Toss Up: Short Answer

What is considered the most unifying concept in biology?

Bonus Answer: Evolution

Bonus: Multiple Choice

You capture a Pikachu and make it hold a Light Ball. You breed this Pikachu and the resulting Pokemon inherits the move Volt Tackle. This phenomenon of inheriting traits due to the actions of individuals reflects what theory:
W) Darwinian Natural Selection
X) Lamarckian Inheritance
Y) Oak-azaki Fragments
Z) Parental Mimicry

Bonus Answer: X

==========

9. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Which of the following is true regarding anthrax:
W) Anthrax is caused by a virus

X) Anthrax is highly contagious
Y) Inhalation anthrax and cutaneous anthrax are caused by separate strains of Bacillus anthracis
Z) Inhalation Anthrax requires infection with a large number of spores
Toss Up Answer: Z

Bonus: Short Answer
Give the binomial nomenclature of the pathogen that causes anthrax:
Bonus Answer: Bacillus anthracis

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10. BIOLOGY

Writer: Jason Mohabir
Toss Up: Multiple Choice
Pine, fir, spruce, cedar, larch and cypress are the famous timber-yielding plants. All these belong to:
W) angiosperms
X) gymnosperms
Y) monocotyledons
Z) dicotyledons

Toss Up Answer: X

Bonus: Multiple Choice
The population of algae in soil is [blank] that of either bacteria or fungi.

W) generally smaller than
X) generally greater than
Y) equal to
Z) none of these

Bonus Answer: W

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11. BIOLOGY

Writer: Jason Mohabir
Toss Up: Short Answer
Nitrogen fixation refers to the direct conversion of atmospheric nitrogen gas into:
Bonus Answer: ammonia

Bonus: Short Answer
The transformation of nitrates to gaseous nitrogen is accomplished by microorganisms in a series of biochemical reactions. The process is known as:
Bonus Answer: denitrification

==========

12. BIOLOGY

Writer: Aaron Gee
Toss Up: Short Answer
Nitrogenous base that occurs in RNA but not in DNA?
Bonus Answer: Uracil

Bonus: Short Answer
Which of the following correctly explains how a favorable genetic trait can increase in frequency in a population?
Bonus Answer: Natural Selection

==========

13. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

Which of the following correctly states the composition of blood?

W) 45 % RBC, 55% Plasma

X) 65 % RBC, 25% Plasma

Y) 85 % RBC, 15% Plasma

Z) 35% RBC, 65% Plasma

Toss Up Answer: W

Bonus: Multiple Choice

What is the function of basophils?

W) to engulf pathogens through phagocytosis

X) to stimulate inflammation by releasing histamine

Y) to kill RBCs

Z) to remove pathogens from RBCs

Bonus Answer: X

==========

14. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

Which gland releases the antidiuretic hormone?

W) pituitary

X) hypothalamus

Y) pancreas

Z) testes

Toss Up Answer: X

Bonus: Multiple Choice

Which part of the heart functions as a pacemaker?

W) AV node

X) S node

Y) SA node

Z) SA pacemaker

Bonus Answer: Y

==========

15. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

Which of the following is the most common organic compound on Earth?

W) chitin

X) glucose

Y) phospholipids

Z) cellulose

Toss Up Answer: Z

Bonus: Multiple Choice

Which of the following syndrome occurs in women born with only 1 X chromosome?

W) Marfan Syndrome

X) Turner Syndrome

Y) Prader-Willi syndrome

Z) Porphyria

Bonus Answer: X

==========

16. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

Which of the following conditions causes an autoimmune response to eating glucose?

W) Anaplasmosis

X) Anisakiasis

Y) celiac disease

Z) Candidiasis

Toss Up Answer: Y

Bonus: Multiple Choice

What is colony collapse disorder characterized by?

W) The disappearance of many male worker bees

X) The death of the queen bee

Y) The destruction of the honey produced by bees

Z) The destruction of the structure of a bee hive

Bonus Answer: W

==========

17. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

Which of the following is not an anabolic steroid?

W) Fenestrane

X) Stanozolol

Y) Fortesta

Z) Deca-Durabolin

Toss Up Answer: W

Bonus: Short Answer

Which scientist became known as the founder of molecular biology due to their discovery of the spiral structure of proteins?

Bonus Answer: Linus Pauling

==========

18. BIOLOGY

Writer: Ivan Zhang

Toss Up: Short Answer

What family are fruit flies apart of?

Bonus Answer: Drosophilidae

Bonus: Short Answer

Which species of animals are the most abundant on Earth?

Bonus Answer: nematodes

==========

19. BIOLOGY

Writer: Ivan Zhang

Toss Up: Short Answer

What is the most abundant element in the human body?

Bonus Answer: Oxygen

Bonus: Short Answer

What is the function of the alveoli?

Bonus Answer: to allow oxygen and carbon dioxide to move between the lungs and bloodstream

==========

20. BIOLOGY

Writer: Aaron Gee

Toss Up: Multiple Choice

Which of the following most closely approximates the number of
protein-coding genes in the human genome?

W) 10,000

X) 20,000

Y) 50,000

Z) 100,000

Toss Up Answer: X

Bonus: Short Answer

Arrange the following to depict the conduction pathway in the
vertebrate heart: 1) atrioventricular node, 2) right and left bundle branches, 3) sinoatrial node, 4) Bundle of His, 5) Purkinje fibers.

Bonus Answer: 3) SINOATRIAL NODE
1) ATRIOVENTRICULAR NODE
4) BUNDLE OF HIS
2)RIGHT AND LEFT BUNDLE BRANCHES
5) PURKINJE FIBERS

==========

21. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the phenomenon that describes the pupil continuously adjusting to different ambient light levels?

Bonus Answer: Pupillary Light Reflex

Bonus: Short Answer

How large, in degrees, is the visual field for the right eye?

Bonus Answer: 150

==========

22. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the G Protein Coupled Receptor for the G protein transducin?

Bonus Answer: Rhodopsin

Bonus: Short Answer

The phototransduction pathway controlled by light striking rhodopsin ultimately affects a sodium channel. What is the second messenger that controls the channel? Be sure to give your answer as “cyclic _ _ _(Read as: “the word cyclic followed by a three letter acronym”)”.

Bonus Answer: cGMP (accept: cyclic guanosine monophosphate)

==========

23. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

If I cut your left optic tract, what part of your visual field will you lose?

W) The left temporal section only

X) The left temporal and left nasal sections

Y) The right nasal section only

Z) The right temporal and right nasal sections

Toss Up Answer: Z

Bonus: Short Answer

What is the name of the spot where the left optic tract and the right optic tract intersect?

Bonus Answer: optic chiasm

==========

24. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Hair cells in the ear form synapses on spiral ganglion cells. These spiral ganglion cells join what nerve that projects to the medulla?

W) VI

X) VIII

Y) X

Z) XII

Toss Up Answer: X

Bonus: Short Answer

What are these hair cells, which have a mechanically gated TRPA1 channel, called?

Bonus Answer: Stereocilia

==========

25. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Chitons, a type of mollusk, have oval-shaped bodies and a shell composed of how many dorsal plates?

W) 6

X) 7

Y) 8

Z) 9

Toss Up Answer: Y

Bonus: Short Answer

Gastropods undergo a distinct developmental process, which causes their visceral mass to rotate 180 degrees, and

as a consequence its anus ends up above its head. What is this process called?

Bonus Answer: torsion

==========

26. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

Certain proteins are released by virus-infected cells which induce neighboring cells to produce substances that will inhibit viral replication. What are these proteins called?

Bonus Answer: Interferons

Bonus: Short Answer

What is the process by which antibodies cover a pathogen such that it is marked for destruction and forms a precipitate to be flushed out?

Bonus Answer: Opsonization

==========

27. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Which of the following types of antibodies is typically used to fight parasitic infections?

W) E

X) M

Y) G

Z) A

Toss Up Answer: W

Bonus: Short Answer

The immune response can include complement protein cascades, which form pores in the membrane of the target cell. The cell then swells and lyses do to water and ions rushing in. The type of complex that forms the pore in the membrane is called?

Bonus Answer: membrane attack (accept: membrane attack complex)

==========

28. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

HIV can be treated with a drug cocktail known as HAART. What does HAART stand for?

Bonus Answer: Highly Active Anti-Retroviral Treatment

Bonus: Short Answer

AIDS patients may become afflicted with an extremely rare cancer caused by a certain herpesvirus. What is this cancer called?

Bonus Answer: Kaposi's Sarcoma

==========

29. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

In 1999, scientists discovered a fossil in China of what appeared to be an early chordate. This chordate had eyes and a brain but no skull, a derived feature of craniates. What was this fossil called?

Bonus Answer: Haikouella

Bonus: Short Answer

What is the class of the most basal group of craniates?

Bonus Answer: Myxini (accept: Hagfishes)

==========

30. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

The phenomenon where bacteria monitor the presence of secreted signaling molecules to determine the local density of cells is called?

Bonus Answer: Quorum sensing

Bonus: Short Answer

Quorum sensing allows bacteria to coordinate their behaviors in synchrony. One example of said behavior is illustrated when you find them on your teeth when you wake up. What has formed on your teeth?

Bonus Answer: biofilm

==========

31. BIOLOGY

Writer: Josh Tish

Toss Up: Short Answer

Which three amino acids can most often be phosphorylated in eukaryotes?

Bonus Answer: Serine, Threonine, Tyrosine

Bonus: Short Answer

After transforming the Ku11 gene into XL10 Gold E. coli and growing the bacteria for a day in selective media in the 25°C incubator, you notice that the colonies are much smaller than they should be. Why did this happen?

Bonus Answer: 37°C is the optimal temperature for growing E. coli. The colonies were smaller because they grew more slowly.

==========

32. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Natural selection is effective in the evolutionary process because it:

W) causes evolution

X) changes allele frequencies

Y) increases the mean fitness of a population

Z) leads to fixation or loss of particular alleles

Toss Up Answer: Y

Bonus: Short Answer

You tie a ribbon to a tree trunk. The height measured from the ribbon to the ground is five feet. The tree grows at a rate of three feet per year. After 10 years, how far up from the ground will the ribbon be?

Bonus Answer: Five feet. The elongation of a tree trunk occurs from the apical meristem up.

==========

33. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

If a gene is fixed in a population:

W) the gene cannot undergo mutation

X) one allele exhibits complete dominance over the other allele of that gene

Y) only one allele appears for that gene in the population

Z) the gene is incapable of recombination

Toss Up Answer: Y

Bonus: Multiple Choice

The Species-Area Relationship suggests that 10% of a given area supports:

W) 90% of species

X) 70% of species

Y) 50% of species

Z) 30% of species

Bonus Answer: Y

==========

34. BIOLOGY

Writer: Josh Tish

Toss Up: Short Answer

You perform a transformation and calculate a viable count of 9000 cells/mL. If your transformation efficiency was 10%, how many colonies would you expect to see if you plate 100uL of cells onto selective media?

Bonus Answer: 90

Bonus: Short Answer

If the mother of a child suffers from diabetes mellitus and deafness (DAD) and the father does not, what is the likelihood that the child will develop degenerative optomosis?

*Note: Diabetes mellitus and deafness (DAD) is a genetic disorder, not separate ailments.

Bonus Answer: 100%. DAD is caused by mutations in mtDNA, which are passed on only by the mother.

==========

35. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

The initial frequency of allele A is 0.6, and the initial frequency of allele a is 0.4. In the next generation, the frequencies for alleles change to 0.61 and 0.39, respectively for each allele. The change in allele frequency is:

W) the result of random mating

X) evolution

Y) the result of natural selection

Z) impossible in a small population

Toss Up Answer: X

Bonus: Multiple Choice

What is the main structure that connects the left and right hemispheres of the brain?

W) corpus callosum

X) thalamus

Y) superior colliculus

Z) amygdala

Bonus Answer: W

==========

36. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Mutation in which of the following types of genes is least likely to result in higher chances of developing cancer?

W) oncogene
X) tumor suppressor gene
Y) proto-oncogene
Z) tumor necrosis factor gene
Toss Up Answer: Z

Bonus: Short Answer
Rearrange the following list of the structures of a nephron in the order in which filtrate flows through them:

1. proximal convoluted tubule
2. ascending limb of Loop of Henle
3. distal convoluted tubule
4. collecting duct
5. Bowman's capsule
6. descending limb of Loop of Henle

Bonus Answer: 5, 1, 6, 2, 3, 4
***A list of the structures or the correct reordering of the numbers assigned to each structure are valid answers**

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37. BIOLOGY

Writer: Janine Goh
Toss Up: Short Answer
Which process is complementary to hydrolysis?
Bonus Answer: Dehydration synthesis

Bonus: Multiple Choice
Which of the following inhibits carbonic anhydrase?
W) Erythromycin
X) Imipramine
Y) Acetazolamide
Z) Ambylmycin

Bonus Answer: Y

==========

38. BIOLOGY

Writer: Janine Goh
Toss Up: Short Answer
Haemoglobin alpha and beta globin chains are found in what 2 chromosomes?
Bonus Answer: Alpha: Chromosome 16
Beta: Chromosome 11

Bonus: Short Answer
Name all types of RNA
Bonus Answer: mRNA, tRNA, rRNA

==========

39. BIOLOGY

Writer: Janine Goh
Toss Up: Short Answer
In which end of DNA is the hydroxyl group found?
Bonus Answer: 3 prime

Bonus: Multiple Choice

Which of the following are types of non-essential amino acids?

W) Phenylalanine and Valine

X) Leucine and Histidine

Y) Histidine and Lysine

Z) Argenine and Tyrosine

Bonus Answer: Z

==========

40. BIOLOGY

Writer: Janine Goh

Toss Up: Short Answer

In DNA replication, the lagging strand is replicated in what fragments?

Bonus Answer: Okazaki

Bonus: Short Answer

Sickle-cell anemia is caused by what type of mutation?

Bonus Answer: Point mutation/deletion

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41. BIOLOGY

Writer: Janine Goh

Toss Up: Short Answer

Where was GFP originally isolated?

Bonus Answer: Jellyfish

Bonus: Multiple Choice

In which of the following organisms was the gene originally expressed in?

W) C. elegans

X) Salmonella

Y) E. coli

Z) Petromyzon

Bonus Answer: W

==========

42. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the smallest and simplest amino acid called?

Bonus Answer: Glycine, GLY

Bonus: Short Answer

What is the R group of the amino acid glycine?

Bonus Answer: a single hydrogen

==========

43. BIOLOGY

Writer: Kerwin Chen

Toss Up: Multiple Choice

Tetrachromacy is the condition of possessing how many types of cone cells?

W) 1

X) 2

Y) 3
Z) 4
Toss Up Answer: Z

Bonus: Short Answer
The lens of the human eye blocks out ultraviolet light, which in turn prevents us from seeing UV light directly. What is the absence of the lens of the eye called?
Bonus Answer: Aphakia

==========

44. BIOLOGY

Writer: Kerwin Chen
Toss Up: Multiple Choice
How many sections does the small intestine consist of?
W) 2
X) 3
Y) 4
Z) 5
Toss Up Answer: X

Bonus: Short Answer
What are the names of the three sections of the small intestine?
Bonus Answer: Duodenum, Jejunum, Ileum

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45. BIOLOGY

Writer: Kerwin Chen
Toss Up: Short Answer
Where is the smallest bone in your body located?
Bonus Answer: Ear

Bonus: Short Answer
What is the name of the smallest bone in the human body
Bonus Answer: Stapes, Stirrup

==========

46. BIOLOGY

Writer: Kerwin Chen
Toss Up: Short Answer
Which two scientists are credited with the discovery of the double helix of DNA?
Bonus Answer: James Watson and Francis Crick, Watson and Crick

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Bonus: Short Answer
Which scientist incorrectly proposed the triple DNA helix model, with the nitrogenous bases pointing outwards and the phosphate forming the core?
Bonus Answer: Linus Pauling, Paulingb

==========

47. BIOLOGY

Writer: Josh Tish
Toss Up: Multiple Choice
Isolated RNA molecules are generally less stable than DNA at physiological pH because:
W) RNA has ribose
X) RNA is always linear

Y) RNA uses uracil instead of thymine
Z) RNA is usually single-stranded

Toss Up Answer: W

Bonus: Multiple Choice
What is the half-life of DNA?
W) 673 years
X) 100 years
Y) 272 years
Z) 521 years

Bonus Answer: Z

==========

48. BIOLOGY

Writer: Josh Tish

Toss Up: Short Answer
A population of 2800 flowers is in Hardy-Weinberg equilibrium, and 2352 of them are red in color. The red allele R is dominant; the white allele r is recessive. What is the frequency of heterozygotes in the population?

Bonus Answer: 48%, or any equivalent form

Bonus: Multiple Choice
Which of the following would be least damaged by a lipase?
W) endoplasmic reticulum
X) mitochondria
Y) ribosome
Z) nuclei

Bonus Answer: Y

==========

49. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice
What is the cause of trisomy 21?
W) error during meiosis
X) error during mitosis
Y) over duplication of chromosome 21
Z) chromosomal insertion

Toss Up Answer: W

Bonus: Multiple Choice
Why is pepsinogen secreted as a zymogen into the stomach?
W) to change the pH of the stomach fluids to aid digestion.
X) to prevent digestion of the gastric glands
Y) to inactivate pepsinogen
Z) to digest complex carbohydrates

Bonus Answer: X

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50. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

How does atropine counter the effects of nerve gas?

W) Atropine binds to the nerve gas and inactivates it

X) Atropine inactivates acetylcholinesterase and allows more acetylcholine to cross the synaptic cleft

Y) atropine blocks the acetylcholine receptor which blocks the excess acetylcholine lingering in the synaptic cleft

Z) atropine stimulates the production of an enzyme that breaks down the nerve gas

Toss Up Answer: Y

Bonus: Short Answer

In order to flower, what does a short-day plant need?

Bonus Answer: Night that is longer than a certain critical length

==========

51. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

What is it called when a species of animal becomes two separate species while inhabiting the same area?

Bonus Answer: Sympatric speciation

Bonus: Multiple Choice

Cladograms are used to determine?

W) Taxonomy

X) Geographic Distribution

Y) Genotype

Z) Evolutionary relatedness

Bonus Answer: Z

==========

52. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What substance protects the stomach from consuming itself?

Bonus Answer: Mucus

Bonus: Multiple Choice

In which organs is thrombopoietin produced?

W) Heart and Liver

X) Liver and Kidney

Y) Kidney and Pancreas

Z) Pancreas and Liver

Bonus Answer: X

==========

53. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

Which glial cells secrete cerebrospinal fluid?

Bonus Answer: Ependymal cells

Bonus: Short Answer

Oxygen attaches to hemoglobin to form oxyhemoglobin. What is it resultant molecule called when carbon dioxide attaches to hemoglobin?

Bonus Answer: Carbaminohemoglobin

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54. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What organelle does the cisternal maturation model describe?

Bonus Answer: Golgi apparatus; Golgi complex

Bonus: Short Answer

What is the part on the retina where cones are tightly packed and creates a small depression?

Bonus Answer: Fovea; Fovea centralis

==========

55. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What functional group normally allows the cell to differentiate old and new DNA strands in prokaryotes?

Bonus Answer: Methyl group; -CH3

Bonus: Short Answer

What is it called when the hematocrit rises above normal levels?

Bonus Answer: hypercythemia; erythrocythemia; hypererythrocythemia

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56. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What hormone released by jextaglomerular cells of the kidney regulates blood pressure and filtration rate?

Bonus Answer: Renin

Bonus: Short Answer

What types of exocrine glands bud their secretions off along with a small portion of the cell itself?

Bonus Answer: Apocrine glands

==========

57. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What types of cells in the stomach are pepsins produced from?

Bonus Answer: Chief cells

Bonus: Short Answer

What factor of the blood clotting cascade converts prothrombin into active thrombin?

Bonus Answer: Factor III; Tissue Factor; Thromboplastin

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58. BIOLOGY

Writer: Hanna Yang

Toss Up: Multiple Choice

Which of the following is a retrovirus?

W) HIV

X) Hepatitis B virus
Y) Poliovirus
Z) Influenza A virus
Toss Up Answer: W

Bonus: Short Answer
Where do DNA viruses usually replicate?
Bonus Answer: In the nucleus.

==========

59. BIOLOGY

Writer: Hanna Yang
Toss Up: Multiple Choice
Which of the following is present in plant cells but not animal cells?
W) Nuclei
X) Plasmodesmata
Y) Mitochondria
Z) Vacuoles
Toss Up Answer: X

Bonus: Short Answer
What is the name of the theory that explains the existence of mitochondria (and why they have their own DNA)?
Bonus Answer: Endosymbiotic Theory

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60. BIOLOGY

Writer: Hanna Yang
Toss Up: Multiple Choice
What transmissible agent causes Mad Cow Disease (BSE)?
W) Viron
X) Virus
Y) Bacteria
Z) Prion

Toss Up Answer: Z

Bonus: Multiple Choice
Which of the following are prions made up of?
W) Proteins, only
X) Nucleic Acids, only
Y) Proteins and Nucleic Acids, only
Z) Proteins and Carbohydrates, only

Bonus Answer: W

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61. BIOLOGY

Writer: Calvin Vuong
Toss Up: Multiple Choice
Exocytotic vesicles are most frequently exported via the
W) endoplasmic reticulum
X) the nuclear envelope
Y) the trans Golgi

Z) the cis Golgi

Toss Up Answer: Y

Bonus: Multiple Choice

Endosomes formed as a result of receptor-mediated endocytosis are most frequently coated with which type of proteins?

W) G proteins

X) clathrins

Y) pseudopodium

Z) microtubules

Bonus Answer: X

==========

62. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Name all of the following that are amphipathic: integral proteins, cholesterol, phospholipids, triacylglycerol, mannose

Bonus Answer: integral proteins ad phospholipids

Bonus: Multiple Choice

Which of the following is not true about a part of the phospholipid?

W) They contain two fatty acid chains.

X) Their heads contain a net charge.

Y) They have a phosphate group in their heads.

Z) They have a choline group in their heads.

Bonus Answer: X

==========

63. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Cellulose and glycogen differ in

W) their alpha/beta glucose configurations

X) branching

Y) their ability to be metabolized

Z) all of the above

Toss Up Answer: Z

Bonus: Short Answer

N-Acetylglucosamine is the monomer of which common polysaccharide?

Bonus Answer: Chitin

==========

64. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following intermolecular interactions is not exclusive to a single polypeptide's tertiary structure?

W) hydrophobic interactions

X) polar interactions

Y) hydrogen bonding

Z) disulfide bridges

Toss Up Answer: Y

Bonus: Short Answer

Polypeptide folding is aided by which type of cavity-structured proteins?

Bonus Answer: Chaperonins

==========

65. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Neurotransmitters are received by which kinds of receptors?

W) G protein coupled receptors

X) receptor tyrosine kinases

Y) ion gated channels

Z) intracellular receptors

Toss Up Answer: Y

Bonus: Multiple Choice

Which of the following is the immediate effect of a signal molecule binding to a receptor tyrosine kinase molecule?

W) It forms a dimer with another receptor tyrosine kinase.

X) It initiates a phosphorylation cascade.

Y) It becomes activated with phosphate groups.

Z) It attaches to a scaffolding protein.

Bonus Answer: W

==========

66. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Of the following, which is a second messenger used in cell signaling?

W) G protein

X) Protein kinase A

Y) adenylyl cyclase

Z) cAMP

Toss Up Answer: Z

Bonus: Short Answer

Adjacent plant cells most commonly communicate via what intercellular junction?

Bonus Answer: Plasmodesmata (ACCEPT: desmotubule)

==========

67. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Introns are hydrolyzed and removed from pre-mRNA by

W) exons

X) spliceosomes

Y) small nuclear ribonucleoproteins

Z) nucleotide-pair substitution

Toss Up Answer: X

Bonus: Short Answer

Okazaki fragments on the lagging strand of DNA are joined by which protein?

Bonus Answer: DNA ligase (ACCEPT: ligase)

==========

68. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following is a storage protein?

W) aquaporin

X) actin

Y) ovalbumin

Z) AP2

Toss Up Answer: Y

Bonus: Short Answer

Which of the following amino acids has a sulfhydryl group in its side chain?

Bonus Answer: cysteine

==========

69. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following statements concerning photosynthetic light reactions is false?

W) Photosystem I contains the P700 reaction center.

X) The electron transport chain following photosystem I drives chemiosmosis.

Y) NADPH is the final election acceptor.

Z) Electrons are replenished in photosystem II by the splitting of water.

Toss Up Answer: X

Bonus: Multiple Choice

Which of the following molecules is not present in the electron transport chain immediately following photosystem II?

W) cytochrome complex

X) plastoquinone

Y) ferredoxin

Z) plastocyanin

Bonus Answer: Y

==========

70. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following hormones does not promote, directly or indirectly, spermatogenesis?

W) prostaglandins

X) luteinizing hormone

Y) follicle stimulating hormone

Z) gonadotropin releasing hormone

Toss Up Answer: W

Bonus: Multiple Choice

Which hormone is synthesized in the hypothalamus and released via the anterior pituitary gland?

W) prolactin

X) thyroid-stimulating hormone

Y) adrenocorticotropic hormone

Z) oxytocin

Bonus Answer: Z

==========

71. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

What type of immune cell is involved in humoral immunity?

Bonus Answer: B cells

Bonus: Short Answer

What is the most common type of immunoglobulin?

Bonus Answer: Immunoglobulin G

==========

72. BIOLOGY

Writer: Zoe Orlin

Toss Up: Short Answer

What is the powerhouse of the cell?

Bonus Answer: Mitochondria!!!

Bonus: Short Answer

What do you use to see?

Bonus Answer: Eyes

==========

73. BIOLOGY

Writer: Zoe Orlin

Toss Up: Short Answer

What are the 5 senses?

Bonus Answer: Taste smell sight hearing touch

Bonus: Short Answer

What is an important component to "taste"?

Bonus Answer: Smell!

==========

74. BIOLOGY

Writer: Zoe Orlin

Toss Up: Short Answer

What is the material that makes up part of your nose and ears?

Bonus Answer: Cartilage

Bonus: Short Answer

How does one acquire an infection of the ear?

Bonus Answer: By a virus or bacteria

==========

75. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

What hormone regulates sleep cycles?

Bonus Answer: Melatonin

Bonus: Short Answer

What blood type is considered the universal donor?

Bonus Answer: O-, O-neg, O-negative

==========

76. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Multiple Choice

What is a technique for studying cell membrane structure and function?

W) cell fractionation

X) freeze fracture

Y) cell centrifugation

Z) inserting radioactive substances

Toss Up Answer: X

Bonus: Short Answer

Which type of microscope is useful for studying the internal structure of cells?

Bonus Answer: transmission electron microscope

==========

77. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Multiple Choice

Which is not a part of the nucleus?

W) nuclear envelope

X) nucleolus

Y) chromatin

Z) plasmodesmata

Toss Up Answer: Z

Bonus: Multiple Choice

Which is not a part of the cytoskeleton?

W) microfilaments

X) intermediate filaments

Y) microtubules

Z) gap junctions

Bonus Answer: Z

==========

78. BIOLOGY

Writer: Siam Muquit

Toss Up: Short Answer

The enzyme catalase is associated with which cell organelle?

Bonus Answer: Peroxisome

Bonus: Short Answer

What dangerous product of fatty acid oxidation does catalase act on?

Bonus Answer: Hydrogen peroxide

==========

79. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

What structure in plant cells is similar to gap junctions in animal cells?

W) Cell wall

X) Central Vacuole

Y) Plasmodesmata

Z) Thylakoid

Toss Up Answer: Y

Bonus: Multiple Choice

If, on average, 46% of the loci in a species' gene pool are heterozygous, then the average homozygosity of the species should be

W) 23%

X) 46%

Y) 54%

Z) There is not enough information to say.

Bonus Answer: Y

==========

80. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

A trend toward the decrease in the size of plants on the slopes of mountains as altitudes increase is an example of

W) a cline

X) a bottleneck

Y) relative fitness

Z) geographic variation

Toss Up Answer: W

Bonus: Short Answer

If thermoregulation is considered to be a secondary function of the large ears of jackrabbits, then the primary function of the ears is

Bonus Answer: to detect predators

==========

81. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Short Answer

An ecologist recorded 12 white-tailed deer, Odocoileus virginianus, per square mile in one woodlot and 20 per square mile in another woodlot. What was the ecologist comparing?

Bonus Answer: density

Bonus: Short Answer

Why do populations grow more slowly as they approach their carrying capacity?

Bonus Answer: Density-dependent factors lead to fewer births and increased mortality. (Accept Density-Dependent

factors)

==========

82. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Short Answer

What is the central dogma?

Bonus Answer: DNA to RNA to Protein.

Bonus: Short Answer

What types of RNA are used in translation.

Bonus Answer: mRNA and tRNA

==========

83. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Multiple Choice

Which of the following places contains ribosomes?

W) Rough endoplasmic reticulum

X) Smooth endoplasmic reticulum

Y) Cell wall

Z) lysosomes

Toss Up Answer: W

Bonus: Short Answer

Do prokaryotic cells have ribosomes?

Bonus Answer: Yes

==========

84. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Short Answer

Where is prokaryotic genetic material located?

Bonus Answer: plasmids

Bonus: Short Answer

Do prokaryotic cells have cell walls?

Bonus Answer: Yes

==========

85. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Short Answer

What is the most current model of the cell membrane called?

Bonus Answer: Fluid Mosaic Model

Bonus: Short Answer

Who came up with the fluid mosaic model?

Bonus Answer: SJ Singer and GL Nicolson

==========

86. BIOLOGY

Writer: Sean Vaysburd

Toss Up: Short Answer

What is the name of the proteins in cell membranes that allow for rapid transport of water into and out of the cell?

Bonus Answer: Aquaporins

Bonus: Short Answer

What membrane bound structures in cells are important for exocytosis?

Bonus Answer: transport vesicles

==========

87. BIOLOGY

Writer: Olivia Gallager

Toss Up: Multiple Choice

Which of the following enzymes makes C4 and CAM species more efficient in hotter, dryer climates?

W) phosphofructokinase

X) Rubisco

Y) DNA polymerase

Z) PEP Carboxylase

Toss Up Answer: Z

Bonus: Short Answer

During the light dependent reactions, on what membrane does ATP synthesis take place via ATP Synthase?

Bonus Answer: thylakoid, thylakoid membrane

==========

88. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

What part of the brain controls the interaction between the two hemispheres?

Bonus Answer: corpus callosum

Bonus: Short Answer

Which lobe of the brain is known for spatial reasoning and navigation?

Bonus Answer: parietal lobes

==========

89. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

Defects in the myelin sheath lead to what disease?

Bonus Answer: Multiple Sclerosis

Bonus: Short Answer

From which parent do we inherit mitochondrial DNA?

Bonus Answer: Mothers, maternal

==========

90. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Metastasis involves

W) decreased levels of proteins that regulate metalloproteins

X) programmed cell death

Y) closing of aromatic rings

Z) bioinformatic analysis of clinical trial

Toss Up Answer: W

Bonus: Multiple Choice

BRACI, an inherited form of breast cancer, regulates cell division by

W) binding to a DNA sequence

X) binding to the protein RAD 51 which repairs DNA damage

Y) complexing with cyclins

Z) binding to the cell outer membrane

Bonus Answer: X

==========

91. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Which protein did Nobel Laureate Christian Anfinsen characterize to come to the conclusion that the native structure is determined only by the protein's amino acid sequence?

W) catalase

X) ribonuclease A

Y) luciferase

Z) amylase

Toss Up Answer: X

Bonus: Short Answer

What is the name of the thought experiment that postulates that because of the very large number of degrees of freedom in an unfolded polypeptide chain, the molecule has an astronomical number of possible conformations?

Bonus Answer: Levinthal's paradox OR Levinthal

==========

92. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

The BLAST program is used in

W) Bioinformatics

X) DNA Sequencing

Y) Amino acid Sequencing

Z) DNA Barcoding

Toss Up Answer: W

Bonus: Multiple Choice

Phylogenetic relationships can be shown by

W) Dendrogram

X) Gene bank

Y) Data retrieving tool

Z) Data search tool

Bonus Answer: W

==========

93. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Proteonomics is the study of

W) sets of proteins
X) sets of proteins in a specific organelle
Y) entire set of expressed proteins in a cell
Z) none of these

Toss Up Answer: Y

Bonus: Multiple Choice

The computational methodology that tries to find the best matching between two molecules, a receptor and ligand called:
W) molecular matching
X) molecular docking
Y) molecular fitting
Z) molecule affinity checking

Bonus Answer: X

==========

94. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

The field of biostatistics is also called
W) statistics in biology
X) bionemerology
Y) biometry
Z) Both W and X

Toss Up Answer: Y

Bonus: Multiple Choice

The word [must be said in a German accent] "statistik" in German means:
W) calculation
X) government
Y) maths
Z) classification

Bonus Answer: X

==========

95. BIOLOGY

Writer: Jason Mohabir

Toss Up: Multiple Choice

Which of the following phospholipids is released by phagocytic cells and leads to superoxide radical production in alveoli macrophages?
W) Plasmalogens
X) Phosphatidylinositol
Y) Cardiolipin
Z) Platelet activating factor

Toss Up Answer: Z

Bonus: Short Answer

Which of the following forms of movement do the phospholipids of plasma membranes have routinely exhibit? Answer

with the number.

1. Diffusion in the plane of the bilayer
2. Translocation from one side of the bilayer to the other side
3. Rotation of fatty-acid residues around saturated carbon atoms

Bonus Answer: 1 and 3

==========

96. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

Animals and fungi are both characterized as heterotrophic. The distinguishing factor of animal heterotrophy from fungal heterotrophy is that only animals derive their nutrition by

W) consuming living, rather than dead, prey.
X) preying on animals
Y) ingesting it
Z) using enzymes for digestion

Toss Up Answer: Y

Bonus: Multiple Choice

At which developmental stage should one be able to first distinguish a diploblastic embryo from a triploblastic embryo?

W) fertilization
X) gastrulation
Y) coelom formation
Z) cleavage

Bonus Answer: X

==========

97. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which biome is characterized by population oscillations?

W) Temperate Deciduous
X) Tropical Rainforest
Y) Tundra
Z) Taiga

Toss Up Answer: Y

Bonus: Short Answer

Large-scale population oscillations in the tundra are caused by what abiotic factor?

Bonus Answer: Thawing and freezing of the ice (Also accept: population migrations)

==========

98. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which disease was famously eradicated in 1977?

W) Polio
X) Smallpox
Y) Mumbs
Z) AIDS

Toss Up Answer: X

Bonus: Short Answer

Which human body system is attacked by AIDS?

Bonus Answer: Immune system

==========

99. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which pair of organisms is correctly matched with the interspecific interaction?

W) Commensalism: Clownfish and sea anemone

X) Parasitism: Whales and barnacles

Y) Mutualism: Oxpecker and rhino

Z) Predation: Apes and bees

Toss Up Answer: Y

Bonus: Short Answer

List the 5 types of interspecific interaction.

Bonus Answer: Predation, Commensalism, Parasitism, Mutualism, Neutral

==========

100. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

How many ATP molecules are produced by the Calvin cycle?

Bonus Answer: 0

Bonus: Short Answer

How many ATP are used in the Calvin cycle to make one glucose molecule?

Bonus Answer: 18

==========

101. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

The phenomenon by which diploid cells cease to divide is known as

W) parthenogenesis

X) alternation of generations

Y) cellular senescence

Z) lysis

Toss Up Answer: Y

Bonus: Short Answer

What country has the highest human life expectancy?

Bonus Answer: Japan

==========

102. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

What term describes the number of times a normal human cell population can divide?

Bonus Answer: Hayflick limit

Bonus: Multiple Choice
What controls the Hayflick limit?
W) apoptosis
X) length of telomeres
Y) genomic instability
Z) genetic drift

Bonus Answer: X
==========

103. BIOLOGY
Writer: Shanjeed Ali
Toss Up: Short Answer
Which two monosaccharides make up lactose?
Bonus Answer: Glucose and galactose

Bonus: Short Answer
Which two monosaccharides make up sucrose?
Bonus Answer: Glucose and fructose
==========

104. BIOLOGY
Writer: Shanjeed Ali
Toss Up: Short Answer
What are the purine bases in DNA?
Bonus Answer: Adenine and guanine

Bonus: Short Answer
What are the pyrimidine bases in RNA?
Bonus Answer: Cytosine and uracil
==========

105. BIOLOGY
Writer: Shanjeed Ali
Toss Up: Multiple Choice
The purpose of Glial cells is to
W) insulate and protect neurons
X) insulate and protect endothelial cells
Y) protect the body from viral diseases
Z) reinforce smooth muscle
Toss Up Answer: W

Bonus: Short Answer
Blood is to the circulatory system as hemolymph is to the
Bonus Answer: hemocoel
==========

106. BIOLOGY
Writer: Shanjeed Ali
Toss Up: Short Answer
Platelets are pieces of what type of cell?
Bonus Answer: Megakaryocytes

Bonus: Multiple Choice

Where do erythrocytes develop?
W) spleen
X) trabecular bone
Y) cortical bone
Z) bone marrow

Bonus Answer: Z

==========

107. BIOLOGY

Writer: George Papastefanou

Toss Up: Multiple Choice

Rett syndrome displays which of the following inheritance patterns?
W) Autosomal Dominant
X) Autosomal Recessive
Y) X-Linked Dominant
Z) X-Linked Recessive

Toss Up Answer: Y

Bonus: Short Answer

In the genetic disorder known as cri-du-chat, what chromosome is affected?

Bonus Answer: Chromosome 5

==========

108. BIOLOGY

Writer: George Papastefanou

Toss Up: Multiple Choice

What kind of typing is used to identify tissue-specific gene expression?
W) Southern Blot
X) Northern Blot
Y) Western Blot
Z) Radioactive Tracer

Toss Up Answer: X

Bonus: Multiple Choice

Which genetic disorder is mainly characterized by an onset in middle age?
W) Huntington's Disease
X) Schizophrenia
Y) Prader-Willi syndrome
Z) Tay-Sachs Syndrome

Bonus Answer: W

==========

109. BIOLOGY

Writer: William Xiang

Toss Up: Multiple Choice

Which of the following enzymes are not utilized by the human body to break down carbohydrates?
W) Amylase
X) Maltase
Y) Lactase
Z) Lipase

Toss Up Answer: Z

Bonus: Multiple Choice

Which of the following is a valid difference between animal and plant cells?

W) Animal cells have a cell membrane whereas plant cells do not.

X) Animal cells contain mitochondria whereas plant cells cannot.

Y) Animal cells can contain multiple vacuoles whereas plant cells cannot.

Z) Animal cells are larger than plant cells.

Bonus Answer: Y

==========

110. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

The myofilaments of muscles consist primarily of two proteins. These two proteins are called

W) actin and myosin

X) progesterone and testosterone

Y) progesterone and estrogen

Z) estrogen and testosterone

Toss Up Answer: W

Bonus: Short Answer

The alternative forms of gene at the same locus on homologous chromosomes are called what?

Bonus Answer: alleles

==========

111. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

Rough endoplasmic reticulum is named rough because it possesses
what cellular structures?

Bonus Answer: ribosomes

Bonus: Short Answer

What is the anatomical term for the specific section of the small
intestine into which the pancreatic duct delivers its digestive enzymes?

Bonus Answer: duodenum

==========

112. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

Robert Hooke coined the term ‘cell’ mostly because of

W) his observations of red blood cells

X) his observations of cork cells

Y) his analysis of hundreds of different protozoans

Z) his readings of the works of other early microscopists

Toss Up Answer: X

Bonus: Multiple Choice

Who is known as the "father of microbiology"?
W) Hans Jansen
X) Robert Hooke
Y) Antony van Leeuwenhoek
Z) Hans Solo

Bonus Answer: Y

==========

113. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

The adult human of average age and size has approximately how many quarts of blood?
W) 4
X) 6
Y) 8
Z) 10

Toss Up Answer: X

Bonus: Multiple Choice

When a human donor gives a pint of blood, it usually requires how many weeks for the body RESERVE of red corpuscles to be replaced?
W) 1 week
X) 3 weeks
Y) 7 weeks
Z) 21 weeks

Bonus Answer: Y

==========

114. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

The several types of white blood cells are sometime collectively referred to as:
W) erythrocytes (pron: eh-rith-row-cites)
X) leukocytes (pron: lew-kah-cites)
Y) erythroblasts (pron: eh-rith-rah-blast)
Z) thrombocytes (pron: throm-bow-cites)

Toss Up Answer: X

Bonus: Short Answer

There are three substances found in human blood which carry oxygen and which begin with the letter "H". Name two of these substances.

Bonus Answer: Any 2 of the following: Hemoglobin, Hemocyanin, Hemerythrin

==========

115. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

The smallest of the FORMED elements of the blood are the:
W) white cells

X) red cells
Y) platelets
Z) erythrocytes (pron: eh-rith-row-cites)

Toss Up Answer: Y

Bonus: Multiple Choice

The condition in which there is a DECREASE in the number of white blood cells in humans is known as:
W) leukocytosis (pron: lew-kO-sigh-toe-sis)
X) leukopenia (pron: lew-kO-pea-nee-ah)
Y) leukemia (pron: lew-kee-me-ah)
Z) leukohyperia (pron: lew-kO-high-per-e-ah)

Bonus Answer: X

==========

116. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

In the human brain, body temperature, metabolism, heart rate, sexual development, sleep and the body's use of fat and water are influenced by this region of the brain. This region of the brain is the:
W) hypothalamus
X) midbrain
Y) corpus callosum
Z) cerebellum

Toss Up Answer: W

Bonus: Multiple Choice

When a wound occurs in humans, the platelets in the blood activate a substance which starts the clotting process. The substance which starts the clotting is:
W) adenosine (pron: ah-den-ah-seen)
X) histamine
Y) lecithin (pron: less-ah-thin)
Z) thrombin

Bonus Answer: Z

==========

117. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

In most axons, the myelin sheath is interrupted at intervals of about 1 millimeter or more. These interruptions are called the:
W) glial
X) nodes of Ranvier (pron: ron-vee-ay)
Y) collaterals
Z) nodes of Banbinet

Toss Up Answer: X

Bonus: Multiple Choice

Cariology is the study of?

W) human hearts

X) tooth decay

Y) kidneys

Z) liver

Bonus Answer: X

==========

118. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

In cell division, what is the phase that follows metaphase?

W) prophase

X) anaphase

Y) telophase

Z) extophase

Toss Up Answer: X

Bonus: Short Answer

All cells of an organism find their lineage from a single fertilized cell. This single fertilized cell is called what?

Bonus Answer: zygote

==========

119. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

This major protein component of connective tissue in mammals comprises most of the organic matter of skin, tendons, bones, and teeth, and occurs as fibrous inclusions in most other body structures. What is this protein component called?

W) elastin

X) collagen

Y) fatty acids

Z) keratin

Toss Up Answer: X

Bonus: Short Answer

Name the clear watery liquid that surrounds the brain and spinal cord and fills the four cavities or ventricles of the brain.

Bonus Answer: cerebrospinal fluid

==========

120. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

The resting potential of a neuron is dependent on what two ions?

W) lead and calcium ions

X) calcium and phosphate ions

Y) sodium and potassium ions

Z) potassium and phosphate ions

Toss Up Answer: Y

Bonus: Multiple Choice

Which of the following is NOT a type of neuron?

W) sensory

X) motor

Y) association

Z) stimulatory

Bonus Answer: Z

==========

121. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

Melatonin (pron: mel-eh-toe-nin) is produced by the:

W) skin

X) pineal gland

Y) liver

Z) pituitary gland

Toss Up Answer: X

Bonus: Multiple Choice

Which of the following statements is TRUE of insulin?

W) secreted by the pancreas

X) involved in the metabolism of glucose

Y) a protein

Z) all of the above

Bonus Answer: Z

==========

122. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

Fertilization of the ovum by the sperm usually occurs in the:

W) oviduct

X) vagina

Y) uterus

Z) ovary

Toss Up Answer: W

Bonus: Multiple Choice

Which of the following structures is directly attached to the ovary?

W) oviduct

X) uterus

Y) suspensory ligaments

Z) vagina

Bonus Answer: Y

==========

123. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

During which phase of the cell cycle are normal components of the
cell synthesized and assembled?
W) the M phase
X) the G1 phase
Y) the S phase
Z) the G2 phase

Toss Up Answer: X

Bonus: Short Answer

If an individual has two dissimilar alleles for a trait, with regard to that trait he is said to be:

Bonus Answer: heterozygous

==========

124. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

How many chromosomes per cell does a Down's Syndrome (trisomy 21) victim have?

Bonus Answer: 47

Bonus: Short Answer

If a male who is heterozygous for an autosomal trait mates with a female who is
also heterozygous for that trait, what percent of their offspring are likely to be heterozygous for this trait as well?

Bonus Answer: 50%

==========

125. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

Glucose is stored as what molecule in plants?

Bonus Answer: starch

Bonus: Short Answer

What is the most common name of the protein that synthesizes DNA?

Bonus Answer: DNA polymerase (ACCEPT: polymerase)

==========

126. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of the following is not a strong acid?
W) H_2SO_4
X) HNO_3
Y) HClO
Z) $HClO_4$

Toss Up Answer: Y

Bonus: Short Answer

In a 1M solution of $HClO_4$, what are the two ions and what are their concentrations?

Bonus Answer: 1 M H^+ , 1 M ClO_4^-

==========

127. BIOLOGY

Writer: Elias Milborn

Toss Up: Short Answer

What is the largest internal organ in the human body

Bonus Answer: liver

Bonus: Multiple Choice

Plants that grow under average temperature and moisture are called:

W) halophytes

X) xerophytes

Y) hydrophytes

Z) mesophytes

Bonus Answer: Z

==========

128. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Polio is caused by which type of microbe?

W) Bacteria

X) Fungus

Y) Prion

Z) Virus

Toss Up Answer: Z

Bonus: Short Answer

Which human body system does polio most directly affect?

Bonus Answer: Nervous system (accept Central nervous system)

==========

129. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is class of proteins "unzips" the DNA strands into two?

Bonus Answer: DNA helicase

Bonus: Short Answer

What is the probability that a cross between two parents with the same genotype of AaBbCcDd will result in an offspring of the same genotype as their parents?

Bonus Answer: 1/16

==========

130. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the arrangement of microtubules in a motile cilium called?

Bonus Answer: 9 + 2 ('nine plus two')

Bonus: Short Answer

What are the common large motor proteins that move flagella and motile cilia called?

Bonus Answer: dyneins (accept: dynein)

==========

131. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the main fiber that makes up the extracellular matrix?

Bonus Answer: Collagen

Bonus: Multiple Choice

Which of the following allow for cell signaling?

I. Desmosomes II. Gap Junctions III. Tight Junctions IV. Plasmodesmata

W) I, II, III

X) II and IV

Y) II and III

Z) I and IV

Bonus Answer: X

==========

132. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Which of the following pairs of scientists elucidated the current model of the cell membrane?

W) Frye and Edidin

X) Davson and Danielli

Y) Singer and Nicholson

Z) Gorter and Grendel

Toss Up Answer: Y

Bonus: Short Answer

Which of the following allow the protist Paramecium caudatum to survive in their hypotonic environments? I. Plasma membrane II. Cell Wall

III. Pseudopodia IV. Contractile Vacuole

Bonus Answer: I and IV

==========

133. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What molecule is the phosphorylated intermediate of the ATP-coupled reaction derived from?

The reaction is glutamic acid + ammonia --> glutamine. The free energy change is +3.4 kcal/mol.

Bonus Answer: Glutamic Acid

Bonus: Short Answer

The evolution of enzymes was traced in an experiment with E. coli. What enzyme was mutated in the experiment?

Bonus Answer: beta-galactosidase

==========

134. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

What enzyme, which can be inhibited or activated, serves as the point in which the cell is committed to performing

glycolysis?
W) Hexokinase
X) Phosphoglucoisomerase
Y) Phosphoglycerokinase
Z) Phosphofructokinase

Toss Up Answer: Z

Bonus: Multiple Choice

The electrons from the electron carrier FADH2 are initially shuttled to which complex in the electron transport chain?
W) complex I
X) complex II
Y) complex III
Z) complex IV

Bonus Answer: X

==========

135. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

During chemiosmosis, protons enter and exit which component of the ATP synthase complex?
W) rotor
X) internal rod
Y) stator
Z) catalytic knob

Toss Up Answer: Y

Bonus: Short Answer

What is the name of the only member of the electron transport chain in cellular respiration that is not a protein?

Bonus Answer: Ubiquinone

==========

136. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What molecule or one of its derivatives serves as the final electron acceptor in fermentation?

Bonus Answer: Pyruvate

Bonus: Short Answer

In alcoholic fermentation, pyruvate is converted to a compound which acts as the final electron acceptor, being converted to ethanol in the process. What is this compound called?

Bonus Answer: Acetaldehyde

==========

137. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the process of breaking down fatty acids and converting them to acetyl CoA called?

Bonus Answer: beta oxidation

Bonus: Short Answer

For every 6 molecules of carbon dioxide consumed for photosynthesis, how many molecules of water are consumed?

Bonus Answer: 12

==========

138. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Theodore Engelmann performed a famous experiment with filamentous algae and aerobic bacteria. What was he trying to find out about photosynthesis?

W) action spectrum

X) absorption spectrum

Y) electromagnetic spectrum

Z) spectrophotomic range

Toss Up Answer: W

Bonus: Short Answer

What metallic atom is at the center of the light-absorbing head of a chlorophyll molecule?

Bonus Answer: Magnesium

==========

139. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the process of electrons being shuttled between Photosystem I and the cytochrome complex called?

Bonus Answer: cyclic electron flow

Bonus: Multiple Choice

In linear electron flow during the light reactions, electrons shuttled by Plastocyanin reduce what molecule?

W) P700

X) P680

Y) Plastoquinone

Z) Ferredoxin

Bonus Answer: W

==========

140. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of these is not an abiotic factor that influences climate?

W) Sunlight

X) Precipitation

Y) Wind

Z) Bodies of water

Toss Up Answer: Z

Bonus: Short Answer

What type of population distribution characterizes human populations?

Bonus Answer: Clumped distribution (Accept clumped)

==========

141. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What individual cell structure comprises polysomes?

Bonus Answer: Ribosome

Bonus: Short Answer

What is the complementary RNA for [read slowly] CAGGGTAC?

Bonus Answer: GUCCCAUG

==========

142. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What muscle of the respiratory system regulates primarily regulates breathing?

Bonus Answer: Diaphragm

Bonus: Short Answer

What protein catalyzes the reaction of carbon dioxide with water to form bicarbonate ion and hydrogen ion?

Bonus Answer: Carbonic anhydrase

==========

143. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What types of macromolecules to lipase break down?

Bonus Answer: Lipids

Bonus: Short Answer

What lobe of the brain is associated with vision?

Bonus Answer: Occipital Lobe

==========

144. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What type of tissue are the urinary bladder comprised of?

Bonus Answer: Transitional epithelium

Bonus: Short Answer

The walls of the heart consist of three layers. What is the middle layer called, which is also the main layer that allows the heart's muscular contractions?

Bonus Answer: Myocardium

==========

145. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

The flow of what ion allows ATP synthase to synthesize ATP?

Bonus Answer: H+, hydrogen ion, proton

Bonus: Short Answer

Which cellular structures oxygen to oxidize complex molecules to produce a by-product of hydrogen peroxide?

Bonus Answer: Peroxisome

==========

146. BIOLOGY

Writer: Hanna Yang

Toss Up: Multiple Choice

How is oxygen transported in blood?
W) It is dissolved in the blood
X) It is carried by hemoglobin on white blood cells
Y) It is carried by hemoglobin on red blood cells
Z) It is carried by hemoglobin on platelets
Toss Up Answer: Y

Bonus: Short Answer
By name or by number, identify which of the following was can carbon dioxide be transported in blood?
1. It can be dissolved in the blood
2. It can be carried by hemoglobin on white blood cells
3. It can be carried by hemoglobin on red blood cells
4. It can be carried by hemoglobin on platelets
Bonus Answer: 1 & 3

==========

147. BIOLOGY

Writer: Justin Lam
Toss Up: Multiple Choice
Which of the following polysaccharides is commonly found in the exoskeleton of insects?
W) Cellulose
X) Chitin
Y) Starch
Z) Glycogen

Toss Up Answer: X

Bonus: Multiple Choice
In which stage of cellular respiration is glucose broken down into two pyruvate molecules?
W) Krebs Cycle
X) Electron Transport Chain
Y) Glycolysis
Z) Oxidative Phosphorylation

Bonus Answer: Y

==========

148. BIOLOGY

Writer: Justin Lam
Toss Up: Short Answer
In photosynthesis, what are the three products released from hydrolysis?
Bonus Answer: Hydrogen or Hydrogen Ions (H+) , Oxygen or Oxygen Gas , and Electrons

---

Bonus: Multiple Choice
Which of the following carbohydrates the human body can NOT digest?
W) Fructose
X) Cellulose
Y) Sucrose
Z) Dextrose

Bonus Answer: X

==========

149. BIOLOGY

Writer: Justin Lam

Toss Up: Multiple Choice

Which of the following stages in cellular respiration generates the most ATP (Adenosine triphosphate) ?

W) Krebs Cycle

X) Glycolysis

Y) Electron Transport Chain

Z) Pyruvate Oxidation

Toss Up Answer: Y

Bonus: Short Answer

In cellular respiration, there are two main electron carriers produced. What are their chemical formulas?

Bonus Answer: NADH and FADH2 (Some may mention the "empty forms" of these electron carriers: NAD+ and FAD ; those answers are acceptable as well).

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150. BIOLOGY

Writer: Hanna Yang

Toss Up: Short Answer

What is the name of the process wherein osteoblasts lay down new bone material?

Bonus Answer: Ossification, Osteogenesis, Bone Tissue Formation

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Bonus: Short Answer

What is the name of the structure within a bone that creates a network containing blood vessels?

Bonus Answer: Haversian Canals

==========

151. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

An individual suffers brain damage that results in respiratory failure. Which region of the brain was most likely damaged?

W) Substantia nigra

X) Pons

Y) Red nucleus

Z) Reticular formation

Toss Up Answer: X

Bonus: Multiple Choice

A man and a woman get married and soon learn that they both have a rare, genetically inherited recessive disorder that makes them prone to dizziness. Worried about the fate of their children, they seek the advice of a genetic counselor. She sequences their genomes and assures them that
none of their children will have the disorder. What information would she have to obtain from the sequencing procedure that allows her to make this claim?

W) The dizziness phenotype in the man is due to a mutation in a gene other than the gene responsible for the woman's phenotype.

X) The dizziness disorder is an autosomal recessive trait.

Y) The man and the woman are related genetically causing the same dizziness phenotype.

Z) It is impossible for the man and the woman to have unaffected children - the genetic counselor is wrong.

Bonus Answer: W

==========

152. BIOLOGY

Writer: Josh Tish

Toss Up: Short Answer

After 12 weeks of gestation, what is the principal source of estrogen and progesterone to a human fetus?

Bonus Answer: corpus luteum

Bonus: Multiple Choice

Fat enters the venous system from the digestive system via the:

W) hepatic artery

X) hepatic vein

Y) thoracic duct

Z) hepatic portal system

Bonus Answer: Y

==========

153. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

What is the probability of obtaining offspring with the AAbbCCdd genotype from parents with the genotypes AaBbCcDd and AABbCcDd (assume independent assortment of all gene pairs)?

W) 1/64

X) 1/128

Y) 3/128

Z) none of the above

Toss Up Answer: X

Bonus: Multiple Choice

A red pigment is extracted from a marine alga. Which best supports the hypothesis that the pigment is involved in photosynthesis? The red pigment:

W) has an absorption spectrum similar to the photosynthetic action spectrum for that same marine alga

X) contains iron which is a transition element similar to magnesium.

Y) has a molecular structure similar to that of chlorophyll.

Z) is also found in land plants together with a variety of other pigments and specific enzymes that are related to the action spectrum for photosynthesis.

Bonus Answer: W

==========

154. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Which of the following are characteristics of both bacteria and fungi?

W) Cell wall, unicellularity, and mitochondria

X) Cell wall, DNA, and plasma membrane

Y) Nucleus, organelles, and unicellularity

Z) Nucleus, RNA, and cell wall

Toss Up Answer: X

Bonus: Multiple Choice

Terminally differentiated cells are most often found in which phase of the cell cycle?

W) G0

X) G1

Y) G2

Z) S

Bonus Answer: W

==========

155. BIOLOGY

Writer: Hanna Yang

Toss Up: Multiple Choice

Which of the following cells come from megakaryocytes?

W) Erythrocytes

X) Leukocytes

Y) Blood Thrombocytes

Z) Osteocytes

Toss Up Answer: Y

Bonus: Multiple Choice

Which of the following diseases is caused by a point mutation?

W) Huntington's Disease

X) Hemophilia B

Y) Cystic Fibrosis

Z) Tay-Sachs Disease

Bonus Answer: X

==========

156. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

What hormone is released in response to low blood sugar levels?

Bonus Answer: glucagon

Bonus: Multiple Choice

Which of the following changes occur upon the activation of the sympathetic nervous system?

W) Heart rate increases

X) Rate of digestion increases

Y) Pupils constrict

Z) Glucose is converted to glycogen

Bonus Answer: W

==========

157. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

How many classes of immunoglobulins are there in the human body?

Bonus Answer: 5

Bonus: Short Answer

Which immunoglobulin is the largest, with 10 light and heavy chains each?

Bonus Answer: IgM, Immunoglobulin M, Immunoglobulin Mu

==========

158. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What are noncoding regions of dna called?

Bonus Answer: introns

Bonus: Short Answer

What are coding regions of dna called?

Bonus Answer: exons

==========

159. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

The A site, P site, and E site are located in which organelle?

Bonus Answer: ribosome

Bonus: Short Answer

Which site does the tRNA enter the ribosome?

Bonus Answer: A site, aminoacyl-tRNA site

==========

160. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the name of the gene recombination that allows for the diversity of an antibody's heavy chain?

Bonus Answer: V(D)J Recombination

Bonus: Short Answer

Which scientist won a Nobel prize in 1987 in Physiology or Medicine for his discovery on the mechanism behind antibody diversity?

Bonus Answer: Susumu Tonegawa, Tonegawa

==========

161. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the name of the gene sequence that is recognized by VDJ recombinases?

Bonus Answer: Recombination signal sequences, RSS

Bonus: Short Answer

In V(D)J recombination, which enzyme adds nucleotides to allow for further diversity?

Bonus Answer: Terminal Deoxynucleotidyl Transferase, TdT

==========

162. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the origin of replication of DNA called?

Bonus Answer: Ori

Bonus: Short Answer

What is the ori of Escherichia Coli called?

Bonus Answer: OriC

==========

163. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

Which of the following are true regarding angiosperm seed development?

W) Seeds often develop on leaves

X) They often exist in cone form

Y) Seeds are enclosed within the ovary

Z) Seeds are on the stamen

Toss Up Answer: Y

Bonus: Short Answer

What enzyme catalyses the removal of electrons?

Bonus Answer: oxidase

==========

164. BIOLOGY

Writer: Janine Goh

Toss Up: Multiple Choice

How is the lagging strand of DNA synthesised during DNA replication?

W) Semi-conservatively

X) Okazaki Fragments

Y) With topoisomerase

Z) Continuously

Toss Up Answer: X

Bonus: Short Answer

What is the purpose of topoisomerase?

Bonus Answer: Ensure that DNA isn't wound to tightly

==========

165. BIOLOGY

Writer: Janine Goh

Toss Up: Short Answer

What is the purpose of SSBs (single strand binding proteins) in DNA replication?

Bonus Answer: To prevent hybridisation of original parent strands

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Bonus: Short Answer

What is the origin of replication called?

Bonus Answer: Ori

==========

166. BIOLOGY

Writer: Janine Goh

Toss Up: Short Answer

What are the two types of amino acids?

Bonus Answer: Polar and non polar R groups

Bonus: Short Answer

What determines the properties of an amino acid?

Bonus Answer: Its variable R group

==========

167. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

Complete the analogy: RBC is to hematopoietin as platelet is to

Bonus Answer: thrombopoietin

Bonus: Short Answer

Hemocytoblasts can branch into two common progenitor cells. What lineage are erythrocytes part of?

Bonus Answer: Myeloid lineage

==========

168. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

In the light dependent reactions of photosynthesis, what molecule supplies the initial electrons?

Bonus Answer: H2O OR water

Bonus: Short Answer

In cellular respiration, the Carbon in carbon dioxide that is released comes from what original molecule?

Bonus Answer: glucose

==========

169. BIOLOGY

Writer: Olivia Gallager

Toss Up: Multiple Choice

Which immune cell does HIV directly target?

W) B Cells

X) Immunoglobulins

Y) CD4 Cells

Z) Killer T Cells

Toss Up Answer: Y

Bonus: Short Answer

Individuals heterozygous for the gene for which genetic disease have increased immunity to malaria?

Bonus Answer: Sickle Cell Anemia

==========

170. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

Of the following, name the conifers: pine, hemlock, palm, maple, cedar

Bonus Answer: pine, hemlock, and cedar or 1, 2, and 5 (in any order)

Bonus: Multiple Choice

What pigment is responsible for the red coloring of cranberries and the purple coloring of eggplant?

W) lycopene

X) anthocyanin

Y) carotene

Z) zeaxanthin

Bonus Answer: X

==========

171. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

You have a multicellular organism that reproduces asexually by fission. When you excise a ~10,000 cell portion of its body, both the original organism and the excised portion grow into fully formed, healthy organisms. You take one of the offspring and repeat the procedure for one hundred and twenty-three generations. Each time, the resulting organisms are healthy. What must be true of the nuclei of this species?

W) The cells contain plasmids

X) The cells have multiple forms of DNA polymerase.

Y) The cells have the majority of their genome stored in circular DNA

Z) The cells contain active telomerase.

Toss Up Answer: Z

Bonus: Multiple Choice

Which of the following oligonucleotides would have the highest melting point when paired with the proper complementary strand?

W) 5'-AAAAAAAA-3'

X) 5'-ATGCATGC-3'

Y) 5'-CGCGCGCG-3'

Z) 5'-TTTTGGGG-3'

Bonus Answer: Y

==========

172. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Which of the following is a way in which the cell increases gene expression in the nucleus?

W) Acetylation of histone tails

X) DNA methylation

Y) Locating a gene within heterochromatin

Z) Dephosphorylating DNA

Toss Up Answer: W

Bonus: Multiple Choice

Which of the following chemicals or groups of chemicals is not a major determinant of flower color?

W) Flavonols

X) Carotenoids

Y) Cyanidin

Z) Phytoalexins

Bonus Answer: Z

==========

173. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

What is the name given to the crosses that occur when maternal and paternal DNA intertwine?

W) polymerase
X) chiasmata
Y) zona pellucida
Z) cambium
Toss Up Answer: X

Bonus: Short Answer
What is the name given to the follicle cells surrounding an egg that has left the ovary?
Bonus Answer: corona radiata

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174. BIOLOGY

Writer: Ivan Zhang
Toss Up: Multiple Choice
What is the name given to a "free-for-all" competition for resources?
W) contest competition
X) scramble competition
Y) intraspecific competition
Z) random competition
Toss Up Answer: X

Bonus: Short Answer
What form of mimicry is described as a "wolf-in-sheep's-clothing" approach?
Bonus Answer: aggressive mimicry

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175. BIOLOGY

Writer: Ivan Zhang
Toss Up: Multiple Choice
What hormone is released by the kidneys in response to oxygen deficiency?
W) erythropoietin
X) Renin
Y) calcitonin
Z) Leptin
Toss Up Answer: W

Bonus: Short Answer
By what type of system is RBC numbers regulated?
Bonus Answer: negative-feedback system

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176. BIOLOGY

Writer: Ivan Zhang
Toss Up: Multiple Choice
Which of the following is the largest patch containing lymphocytes?
W) lymph nodes
X) spleen
Y) thymus
Z) tonsils
Toss Up Answer: Z

Bonus: Short Answer
What mineral deficiency is associated small sex glands and growth failure?

Bonus Answer: Zinc

==========

177. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

What enzyme in the digestive system first breaks down starches?

W) protease

X) secretin

Y) cholecystokinin

Z) amylase

Toss Up Answer: Z

Bonus: Short Answer

What cavity is used cnidarians in digestion?

Bonus Answer: gastrovascular cavity

==========

178. BIOLOGY

Writer: Olivia Gallager

Toss Up: Multiple Choice

Photorespiration occurs the most under which conditions?

W) High Levels of Carbon Dioxide, Low levels of Oxygen

X) in CAM plants

Y) low levels of carbon dioxide, high levels of oxygen

Z) in C4 plants

Toss Up Answer: Y

Bonus: Short Answer

How many carbons does ribulose bisphosphate have?

Bonus Answer: 5

==========

179. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

In the 1920's, the Russian scientist Ivan Pavlov performed a famous set of experiments on dogs. What was the experiment?

Bonus Answer: Conditioning the dogs to salivate when a bell was rung.

Bonus: Short Answer

What hormone maintains the thick lining of the uterus?

Bonus Answer: Progestrone

==========

180. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

What do CFC's do to the environment?

Bonus Answer: They destroy the ozone layer.

Bonus: Short Answer

Name three structures that are in plant cells but not animal cells.

Bonus Answer: Chloroplasts, cell wall, and central vacuole.

==========

181. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

Name three structures that are in animal cells but not plant cells.

Bonus Answer: Centrioles, Flagella

Bonus: Short Answer

What do invasive species do to the ecosystem they disrupt?

Bonus Answer: They don't have natural predators, so they crowd out the native species, effectively killing them off.

==========

182. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

Name three structures in cells that have double membranes.

Bonus Answer: Chloroplasts, mitochondria, and the nucleus.

Bonus: Short Answer

What do we call bacteria with double membranes?

Bonus Answer: Gram-negative bacteria.

==========

183. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

What hormone is released from the thyroid?

Bonus Answer: Thyroxin.

Bonus: Short Answer

What is the compacted glucose in mammals called?

Bonus Answer: Glycogen.

==========

184. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

What causes acid rain?

Bonus Answer: Factories produce sulfer and nitrogen as wastes, and it gets into the air and mixes with rain.

Bonus: Short Answer

Which organism takes in the most CO2 (collectively)?

Bonus Answer: Photoplankton.

==========

185. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

The function of an electron in the electron transport chain is to:

W) transfer energy from complex II to complex I.

X) pump hydrogen ions using complex II.

Y) use its free energy to pump protons against the concentration gradient.

Z) combine with phosphate when ATP is synthesized.

Toss Up Answer: Y

Bonus: Multiple Choice

Fatigue in iron deficiency anemia may be explained in part by all of the following EXCEPT:

W) a lack of functional hemoglobin in the blood.

X) the inability to synthesize ATP.

Y) a lack of functional cytochromes in the electron transport chain.

Z) a lack of functional Coenzyme Q.

Bonus Answer: Z

==========

186. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

What phylum are jellyfish in?

Bonus Answer: Cnidaria.

Bonus: Short Answer

What order are humans in?

Bonus Answer: Primates.

==========

187. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Concerning the generation of ATP by oxidative phosphorylation, all of the following are true EXCEPT:

W) NADH produced in the cytosol of the cell will generate approximately 2.5 ATPs.

X) NADH produced in the mitochondria will generate approximately 2.5 ATPs.

Y) NADH produced by the succinate thiokinase reaction will generate approximately 1.5 GTPs.

Z) FADH2 produced in the mitochondria will generate approximately 1.5 ATPs.

Toss Up Answer: Y

Bonus: Multiple Choice

What enzyme does a retrovirus primarily rely on to create a copy of its genome that is ready for integration into the host genome?

W) DNA gyrase

X) RNA polymerase

Y) Reverse transcriptase

Z) DNA polymerase

Bonus Answer: Y

==========

188. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

What type of pathogen causes malaria?

Bonus Answer: Parasites (or protists).

Bonus: Short Answer

When specialization is starting in the fetus, what three layers are formed (inner to outer)?

Bonus Answer: Endoderm, Mesoderm, Ectoderm

==========

189. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Certain amino acids are considered essential in an animal's diet because they cannot be produced within the organism. Which of the following cellular processes would be most DIRECTLY affected by a dietary deficiency in essential amino acids?

W) Translation of mRNA

X) Cellular respiration

Y) Cell division

Z) Oxygen transport

Toss Up Answer: W

Bonus: Multiple Choice

Integral transmembrane proteins are proteins embedded in the cell membrane. Which of the following amino acids would you MOST expect to find in the transmembrane region of such proteins?

W) Tryptophan

X) Lysine

Y) Arginine

Z) Serine

Bonus Answer: W

==========

190. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

Which cell does HIV attack?

Bonus Answer: The C4 Cells.

Bonus: Short Answer

What is the optimal pH for pepsin?

Bonus Answer: Around 2-3 pH.

==========

191. BIOLOGY

Writer: Eric Shau

Toss Up: Short Answer

Which scientist studied pea plants for years to conclude a pattern was in the height?

Bonus Answer: Gregor Mendel.

Bonus: Short Answer

How is radiation harmful?

Bonus Answer: It causes cells to mutate, or spontaneously die.

==========

192. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Acetone has a distinct smell, which many people associate with the smell of nail polish remover. What might the smell of acetone in the urine or on the breath of a patient indicate?
W) The patient might be degrading too many amino acids from muscle proteolysis.
X) The patient's body might be oxidizing too many fatty acids.
Y) The patient might have enteritis and is absorbing endproducts of fermentation.
Z) The patient might have fructose toxicity.

Toss Up Answer: X

Bonus: Multiple Choice
Which description best describes what would happen to the carbon cycle if all
detritivores suddenly went on "strike" and stopped working?
W) Carbon would increase in inorganic mass, while the atmospheric reservoir of carbon would continue to increase and plants would not be jeopardized.
X) Carbon would accumulate in organic mass, the atmospheric reservoir of carbon would decline, and plants would eventually be starved for CO_2 .
Y) Carbon would increase in organic mass, while the atmospheric reservoir of carbon would increase and plant-life would be starved for CO_2.
Z) Carbon would decrease in organic mass, while the atmospheric reservoir of carbon would increase with the result that plant-life would be starved for CO_2.

Bonus Answer: X

==========

193. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer
How many turns in the Calvin Cycle can it produce one PGAL molecule?

Bonus Answer: 2

Bonus: Short Answer
What diffuses through the ATP syntheses in the process of photosynthesis?

Bonus Answer: Hydrogen ions/protons. The protons in the thylakoids membrane is diffused out by the process of chemiosmosis.

==========

194. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice
Which of these does not result in recombinant bacteria?
W) Transformation
X) Insertion
Y) Transduction
Z) Conjugation

Toss Up Answer: X

Bonus: Short Answer
What serves as an intermediate in transduction?

Bonus Answer: Virus (accept viruses)

==========

195. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

What is the typical size range for a prokaryote?

W) .1 - 1.0 micrometer

X) .5 - 5.0 micrometer

Y) 1-10 micrometer

Z) 10-100 micrometer

Toss Up Answer: X

Bonus: Short Answer

What is the name for the factor that allows a bacteria to become a donor during conjugation?

Bonus Answer: F factor (accept fertility factor)

==========

196. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

What is another name for phinocytosis

?

Bonus Answer: Cell drinking.

Bonus: Multiple Choice

Sugar molecules can enter cells through

W) Exocytosis

X) Facilitated diffusion.

Y) Osmosis.

Z) ATP Synthase.

Bonus Answer: X

==========

197. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

Which scientist, born in 1920, is known for the discovery of DNA's double helical structure using X-ray crystallography?

Bonus Answer: Rosalind Franklin

Bonus: Short Answer

True or false?: Viruses can have DNA.

Bonus Answer: true.

==========

198. BIOLOGY

Writer: Benjamin Avrahami

Toss Up: Short Answer

Which animal phylum was the first to develop true coelems?

Bonus Answer: Annelids (or earthworms)

Bonus: Multiple Choice

Which one of these molecules helps break down some of your food?

W) Hydrochloric Acid

X) Pepsinogen

Y) Trypsin

Z) Mucus

Bonus Answer: Y

==========

199. BIOLOGY

Writer: Benjamin Avrahami

Toss Up: Multiple Choice

Which one of these is an enzyme?

W) Inositol

X) Lyase

Y) Alanine

Z) Butyric Acid

Toss Up Answer: X

Bonus: Multiple Choice

Which molecule is not involved in the Calvin cycle?

W) OAA

X) RuBP

Y) G3P

Z) PGA

Bonus Answer: W

==========

200. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

When electrons move closer to a more electronegative atom, what happens?

W) The more electronegative atom is reduced, and energy is consumed.

X) The more electronegative atom is reduced, and energy is released.

Y) The more electronegative atom is oxidized, and energy is released.

Z) The more electronegative atom is oxidized, and energy is consumed.

Toss Up Answer: X

Bonus: Short Answer

Where does glycolysis take place in eukaryotic cells?

Bonus Answer: Cytosol

==========

201. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

How many carbon atoms are fed into the citric acid cycle as a result of the oxidation of one molecule of pyruvate?

W) 3

X) 1

Y) 2

Z) 6

Toss Up Answer: Y

Bonus: Multiple Choice

In the absence of oxygen, yeast cells can obtain energy by fermentation, resulting in the production of
W) reduction of acetaldehyde to ethanol (ethyl alcohol).
X) oxidation of pyruvate to acetyl CoA.
Y) oxidation of ethanol to acetyl CoA
Z) reduction of ethanol to pyruvate.

Bonus Answer: W

==========

202. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Short Answer

In marine sponges, intracellular digestion of peptides is usually immediately preceded by

Bonus Answer: Endocytosis

Bonus: Short Answer

The large surface area in the gut directly facilitates

Bonus Answer: Absorption

==========

203. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

Which of the following choices would most likely promote random distribution?
W) flocking and schooling behaviors
X) homogeneous chemical and physical factors in the environment
Y) spacing during the breeding season
Z) territorial species

Toss Up Answer: X

Bonus: Multiple Choice

The Allee effect is used to describe a population that
W) has become so large that it will have difficulty surviving and reproducing.
X) has exceeded its carrying capacity.
Y) has become so small that it will have difficulty surviving and reproducing.
Z) Is in crash decline

Bonus Answer: Y

==========

204. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

HIV is an example of which type of shape of virus?
W) Spiral
X) Polyhedral
Y) Spherical
Z) Complex

Toss Up Answer: Z

Bonus: Short Answer

Which of the following types of virus is HIV associated with? Type IV, Type V, Type VI

Bonus Answer: Type VI only (3 only)

==========

205. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of these is not characteristic of an r-selecting species?

W) Small physical size

X) Short life span

Y) Parental care

Z) Variable and unpredictable mortality

Toss Up Answer: Y

Bonus: Short Answer

For each of the following, state whether it is an r-strategist or k-strategist: Oyster, Garden weeds, Desert flowers, Humans

Bonus Answer: Oyster: r-strategist; Garden weeds: r-strategist; Desert flowers: r-strategist; Humans: k-strategist

==========

206. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Nitrifying bacteria convert

W) Atmospheric Nitrogen to Ammonia

X) Ammonia to Nitrite

Y) Nitrite to Nitrate

Z) Nitrate to Nitrite

Toss Up Answer: X

Bonus: Short Answer

What is the shape of the curve of a population growing in ideal conditions?

Bonus Answer: J-curve

==========

207. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Bottom-heavy age structure diagrams are characteristic of populations in:

W) Developed countries

X) Developing countries

Y) Stable populations

Z) Populations with high numbers of elderly

Toss Up Answer: X

Bonus: Short Answer

What is the expression for doubling time of a population given that it grows at constant annual rate of r%?

Bonus Answer: 70/r

==========

208. BIOLOGY

Writer: Siam Muquit

Toss Up: Short Answer

What does the Shannon Index quantify?

Bonus Answer: Biodiversity of a community (accept similar responses)

Bonus: Short Answer

What would be the Simpson's Index value for a population with infinite biodiversity?

Bonus Answer: 0

==========

209. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of these is not a viral disease?

W) Dutch elm disease

X) Yellow fever

Y) Mumps

Z) Rubella

Toss Up Answer: W

Bonus: Short Answer

In which viral reproductive cycle is the viral DNA incorporated into the host DNA?

Bonus Answer: Lysogenic

==========

210. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of the following is thought to have underwent secondary endosymbiosis?

W) Ciliate

X) Dinoflagellates

Y) Diatoms

Z) Algae

Toss Up Answer: Z

Bonus: Short Answer

From what specific class of bacteria are mitochondria thought to originate from?

Bonus Answer: Alpha proteobacteria

==========

211. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

ATP is directly produced from glycolysis by which of the following?

W) respiration

X) oxidative phosphorylation

Y) substrate level phosphorylation

Z) pyruvate oxidation

Toss Up Answer: Y

Bonus: Short Answer

What enzyme is responsible for converting fructose6-phosphate to fructose 1,6-biphosphate in the energy investment phase of glycolysis?

Bonus Answer: phosphofructokinase

==========

212. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following is not an electron carrier involved cellular respiration?

W) NADH

X) FADH2

Y) NADPH

Z) NAD+

Toss Up Answer: Y

Bonus: Multiple Choice

For each turn of the Krebs cycle, how many electron carriers are produced?

W) 3 FADH2 and 1 NADH

X) 6 NADH and 2 FADH2

Y) 3 NAD+ and 1 FAD

Z) 3 NADH and 1 FADH2

Bonus Answer: Z

==========

213. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

How many molecules of carbon dioxide are produced per turn of the Krebs cycle?

Bonus Answer: 2

Bonus: Multiple Choice

A molecule of carbon dioxide is released in the Krebs cycle during the oxidation of which molecule?

W) citrate

X) succinyl CoA

Y) malate

Z) alpha-Ketoglutarate

Bonus Answer: Z

==========

214. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Why are carbohydrates and fats considered high energy foods?

W) They have a lot of oxygen atoms.

X) They can have very long carbon skeletons.

Y) They have a lot of electrons associated with hydrogen.

Z) They are easily reduced.

Toss Up Answer: Y

Bonus: Multiple Choice

Substrate-level phosphorylation accounts for approximately what percentage of the ATP formed by the reactions of glycolysis?

W) 0

X) 2

Y) 10

Z) 100

Bonus Answer: Z

==========

215. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

The majority of ATP molecules generated from cellular respiration comes from which process?

W) glycolysis

X) pyruvate oxidation

Y) the Krebs cycle

Z) chemiosmosis

Toss Up Answer: Z

Bonus: Short Answer

How many ATP molecules on average does chemiosmosis produce per glucose?

Bonus Answer: Accept: 26, 28, or both.

==========

216. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

The majority of photosynthesis occurs in which part of the leaf?

W) the veins

X) the lower paliside layer

Y) the upper paliside layer

Z) the stomata

Toss Up Answer: Y

Bonus: Short Answer

What is the final electron receptor in photosynthetic light reactions?

Bonus Answer: NADP+ (Accept: NADPH)

==========

217. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

The kinases that perform cellular activities throughout the cell cycle are allosterically regulated by what molecules?

Bonus Answer: cyclins

Bonus: Multiple Choice

Synapsis begins during which stage of prophase I?

W) leptotene

X) zygotene

Y) diplotene

Z) diakinesis

Bonus Answer: X

==========

218. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

What cytoskeletal component forms the cleavage furrow during cytokinesis?

Bonus Answer: Microfilaments (Accept: actin)

Bonus: Short Answer

Microtubules are composed of what subunits?

Bonus Answer: tubulin (accept: alpha and beta tubulin dimers)

==========

219. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which transmembrane structures are responsible for communicating signals between the extracellular matrix and the internal microfilament cytoskeleton?

W) integrins

X) fibronectins

Y) proteoglycan complexes

Z) plasmodesmata

Toss Up Answer: W

Bonus: Multiple Choice

The plasmodesmata of plant cells are most similar to which animal cell structure?

W) the plasma membrane

X) desmosomes

Y) gap junctions

Z) desmotubules

Bonus Answer: Y

==========

220. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Motor proteins transport vesicles along which cytoskeletal fiber?

Bonus Answer: microtubules

Bonus: Short Answer

Shape abnormalities of the nuclear lamina are most likely a result of a defect in which cytoskeletal structure?

Bonus Answer: intermediate filaments

==========

221. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Glycoproteins are mainly created by ribosomes attached to which structure?

Bonus Answer: the rough endoplasmic reticulum (accept: rough ER; do NOT accept: ER or endoplasmic reticulum)

Bonus: Short Answer

Drugs like barbiturates commonly increase the size of which endomembrane organelle?

Bonus Answer: the smooth endoplasmic reticulum

==========

222. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

The double membranes found in mitochondria and chloroplasts suggest which of the following?

W) mitochondria and chloroplasts are part of the endomembrane system

X) the endosymbiont theory

Y) chloroplasts evolved before mitochondria

Z) chloroplasts and mitochondria are capable of synthesizing their own proteins

Toss Up Answer: X

Bonus: Short Answer

The light reactions occur in which part of the chloroplast?

Bonus Answer: the thylakoid (or thylakoid membrane)

==========

223. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Protein digestion in humans begins in the

W) mouth

X) stomach

Y) small intestine

Z) large intestine

Toss Up Answer: X

Bonus: Short Answer

Which protein is responsible for protein digestion in the stomach?

Bonus Answer: pepsin (DO NOT accept: pepsinogen)

==========

224. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

In which two process of cellular does carbon dioxide released?

Bonus Answer: Co2 is released in the link reaction and in the Krebs cycle.

Bonus: Short Answer

What type of acid do birds excrete?

Bonus Answer: Uric acid.

==========

225. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

What type of cell are chromosomes located in the nucleus?

Bonus Answer: Eukaryotes.

Bonus: Short Answer

Meiosis of a diploid cell results in_

Bonus Answer: 4 haploid cells.

==========

226. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

Why do we need oxygen for cellular respiration?

Bonus Answer: Oxygen is the final electron acceptor for cellular respiration.

Bonus: Short Answer

How are saturated fat and unsaturated fat different?(refer to bonds)

Bonus Answer: Saturated fats are single bonded, and straight. Unsaturated fats are double bonds and curved.

==========

227. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

Which plant tissue conducts water from the roots to the leaves?

Bonus Answer: Xylem

Bonus: Multiple Choice

Which system rids of nitrogenous waste?

W) Digestive system

X) Integumentary system

Y) Respiratory system

Z) Urinary system

Bonus Answer: Z

==========

228. BIOLOGY

Writer: Yae June Lee

Toss Up: Short Answer

What type of endocytosis is used when it uses pseudopods to move cells between membranes?

Bonus Answer: Receptor mediated endocytosis.

Bonus: Multiple Choice

How can small intestine increase its surface area?

W) Rugae

X) Villi

Y) Cecae

Z) Sphincters

Bonus Answer: X

==========

229. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Kuru is a disease caused by what type of microbe?

W) Bacteria

X) Virus

Y) Prion

Z) Viroid

Toss Up Answer: Y

Bonus: Short Answer

Give the genus and species name of the microbe that causes peptic ulcer disease.

Bonus Answer: Heliobacter pylori

==========

230. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which term describes organisms that can only tolerate a narrow range of temperatures?

W) Eurythermal

X) Stenothermal

Y) Acrithermal

Z) Anglothermal

Toss Up Answer: X

Bonus: Multiple Choice

What is the name of the ecological phenomenon, related to the Small Population hypothesis, that describes a species' path to extinction due to inbreeding and genetic drift?

W) Inbreeding depression

X) Outbreeding depression

Y) Extinction cascade

Z) Extinction vortex

Bonus Answer: Z

==========

231. BIOLOGY

Writer: Elias Milborn

Toss Up: Short Answer

What is the main respiratory pigment of skeletal muscle cells?

Bonus Answer: Myoglobin

Bonus: Multiple Choice

If a parent organism experiences a mutation, then all subsequent offspring of that individual will:

W) always carry the mutated gene, but only as a recessive.

X) Always carry the gene, but never express it phenotypically

Y) only carry the mutated gene if it is heritable

Z) never carry the gene as mutations can never be heritable

Bonus Answer: Y

==========

232. BIOLOGY

Writer: Elias Milborn

Toss Up: Short Answer

What scientist in 1936, building on the discoveries of Szent-Gyorgyi [SENT-GEE-or-gee], postulated the basic reactions of the tricarboxylic acid cycle?

Bonus Answer: Krebs

Bonus: Short Answer

If a plant that is heterozygous for each of three independently-assorting traits is allowed to self-fertilize, what portion of the offspring would be heterozygous for all three traits?

Bonus Answer: 1/8

==========

233. BIOLOGY

Writer: Larry Wong

Toss Up: Short Answer

What is the genus of the common domestic dog?

Bonus Answer: Canis

Bonus: Short Answer

What family does the Carcharodon carcharias belong to?

Bonus Answer: Lamnidae

==========

234. BIOLOGY

Writer: Larry Wong

Toss Up: Short Answer

What plant hormone causes phototropism?

Bonus Answer: auxin

Bonus: Short Answer

What two taxonomic domains are divided based on the presence, or absence, of peptidoglycan?

Bonus Answer: Eubacteria and Archaebacteria

==========

235. BIOLOGY

Writer: Zoe Orlin

Toss Up: Short Answer

The broad climatic zones that Earth's environments are organized into are called

Bonus Answer: BIOMES

Bonus: Short Answer

What biome makes up the majority of NY State?

Bonus Answer: Forest biome :)

==========

236. BIOLOGY

Writer: Zoe Orlin

Toss Up: Short Answer

What is climax vegetation?

Bonus Answer: The dominant type of vegetation in a biome

Bonus: Short Answer

What is the climax vegetation of the tundra?

Bonus Answer: Mosses and/or lichens :D

==========

237. BIOLOGY

Writer: Zoe Orlin

Toss Up: Multiple Choice

What is the main function of a vacuole in a cell?

W) storage

X) coordination

Y) synthesis of molecules

Z) release of energy

Toss Up Answer: W

Bonus: Multiple Choice

If 15% of a DNA sample is made up of thymine, T, what percentage is made up of cytosine, C?

W) 15%

X) 35%

Y) 70%

Z) 85%

Bonus Answer: X

==========

238. BIOLOGY

Writer: Zoe Orlin

Toss Up: Multiple Choice

Global warming has been linked to a decrease in

W) the size of polar icecaps

X) temperature of Earth

Y) rate of species extinction

Z) rate of carbon dioxide production

Toss Up Answer: W

Bonus: Multiple Choice

Why is a mushroom a heterotroph?

W) it manufactures its own food

X) It divides by mitosis

Y) It tranforms light energy into chemical energy

Z) It obtains nutrients from the environment

Bonus Answer: Z

==========

239. BIOLOGY

Writer: Zoe Orlin

Toss Up: Multiple Choice

Every cell in a puppy's skin, eyes, and leg muscles contains

W) equal amounts of ATP

X) identical genetic information

Y) proteins that are all identical

Z) organelles for the synthesis of glucose

Toss Up Answer: X

Bonus: Short Answer

Oxygenated blood contains a high percentage of

Bonus Answer: Hemoglobin

==========

240. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of these is an example of an inhibiting hormone?

W) Somatostatin

X) ACTH

Y) ADH

Z) GH

Toss Up Answer: W

Bonus: Short Answer

In the secondary messenger system characteristic of water-soluble hormones, what enzyme is often used to produce ATP?

Bonus Answer: Adenyl cyclase

==========

241. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

Through what process do cells engulf extracellular particles?

Bonus Answer: Phagocytosis

Bonus: Multiple Choice

Which of the following is not a function of the Golgi Body?

W) separates proteins and lipids according to their destination

X) modifies certain molecules

Y) manufacturing ribosomes

Z) packaging materials into vesicles for transport outside the cell

Bonus Answer: Y

==========

242. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

In DNA, to which carbon of the sugar is the nitrogenous base bonded?

Bonus Answer: Accept one OR one prime

Bonus: Short Answer

On which carbon of the sugar is the hydroxyl group located?

Bonus Answer: Accept three OR three prime

==========

243. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

Which two scientists proved that DNA replication was semi-conservative?

Bonus Answer: Meselson and Stahl

Bonus: Short Answer

Meselson and Stahl replaced an element in DNA with an isotope in order to tag the original DNA molecule. Which element did they replace?

Bonus Answer: Nitrogen

==========

244. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

Who discovered that DNA has equal amounts of adenine and thymine as well as equal amounts of guanine and cytosine?

Bonus Answer: Accept Erwin Chargaff OR Chargaff

Bonus: Short Answer

What method was used to obtain Photograph 51, which was used to determine the structure of DNA?

Bonus Answer: X-ray diffraction

==========

245. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

Where are short tandem repeats usually located?

Bonus Answer: Accept introns OR noncoding DNA

Bonus: Short Answer

Why do DNA molecules travel through the gel in gel electrophoresis?

Bonus Answer: DNA has a negative charge

==========

246. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

What stimulates root branching in plants?

W) Gibberellin

X) Auxin

Y) Ethylene

Z) Cytokinin

Toss Up Answer: X

Bonus: Multiple Choice

A plant with low levels of gibberellin will have:

W) high levels of ethylene

X) decreased levels of lignin

Y) undeveloped leaves

Z) decreased growth

Bonus Answer: Z

==========

247. BIOLOGY

Writer: Aryan Bhatt

Toss Up: Short Answer

This genetic condition results in developmental delays and a flattened facial profile. It is caused by trisomy of the 21st chromosome in humans.

Bonus Answer: Down Syndrome

Bonus: Short Answer

What is the name of the genetic condition in which a person has two X chromosomes and one Y chromosome?

Bonus Answer: Klinefelter syndrome

==========

248. BIOLOGY

Writer: Aaron Gee

Toss Up: Multiple Choice

Which of the following tissues is MOST directly responsible for

the increased diameter of a tree trunk from year to year?
W) apical meristem
X) pericycle
Y) vascular cambium
Z) pith
Toss Up Answer: Y

Bonus: Short Answer
Name all of the following 3 metabolic processes which directly require oxygen: glycolysis; alcohol fermentation; electron transport system
Bonus Answer: Electron transport system

==========

249. BIOLOGY

Writer: Aryan Bhatt
Toss Up: Short Answer
Blood headed toward the lungs exits which chamber of the heart, and through into what blood vessel?
Bonus Answer: Exits the Right ventricle into the pulmonary artery

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Bonus: Short Answer
how many chambers do the hearts of bony fish and frogs have, respectively?
Bonus Answer: 2 and 3

==========

250. BIOLOGY

Writer: Aryan Bhatt
Toss Up: Short Answer
Which group of cells at the top of the heart, also known as the "pacemaker of the heart", sends an electrical signal that causes the atria to contract?
Bonus Answer: The Sinoatrial node (accept SA node)

Bonus: Short Answer
What is the name of the valve that prevents blood from flowing from the left ventricle to the left atrium?
Bonus Answer: Mitral valve

==========

251. BIOLOGY

Writer: Aryan Bhatt
Toss Up: Short Answer
What is the name of the regions of repetitive DNA sequences at the ends of chromosomes?
Bonus Answer: Telomeres?

Bonus: Short Answer
What proteins are DNA strands wrapped around in chromosomes?
Bonus Answer: Histones

==========

252. BIOLOGY

Writer: Aryan Bhatt
Toss Up: Short Answer
The name for the process where an amino acid loses its amino group is called what?
Bonus Answer: Deamination

Bonus: Short Answer

Which essential amino acid, encoded by the DNA codons GTA, GTG, GTC, and GTT, replaces glutamic acid in the β-globin of people with sickle-cell anemia?

Bonus Answer: Valine

==========

253. BIOLOGY

Writer: Aryan Bhatt

Toss Up: Short Answer

What alternative to the Calvin cycle is used by sugarcane and corn?

Bonus Answer: the C_4 cycle (prompt on carbon fixation)

Bonus: Short Answer

Plants that use the CAM cycle as their method of carbon fixation have this adaptation because of what type of climate?

Bonus Answer: Arid or Dry

==========

254. BIOLOGY

Writer: Aryan Bhatt

Toss Up: Short Answer

Where does the digestion of carbohydrates begin when eating, and which type of enzyme is used?

Bonus Answer: The mouth, amylase (prompt on saliva)

Bonus: Short Answer

What is the enzyme that digests proteins in the human stomach?

Bonus Answer: Pepsin

==========

255. BIOLOGY

Writer: Benjamin Avrahami

Toss Up: Multiple Choice

Photosynthesis and cellular respiration are said to be complimentary reactions. Which molecule is involved in both the Calvin cycle in photosynthesis and glycolysis in cellular respiration?

W) OAA

X) PGA

Y) PGAL

Z) 1,3-BPG

Toss Up Answer: Y

Bonus: Short Answer

In chemiosmosis, how many hydrogen ions need to diffuse out of the membrane through ATP synthase before a molecule of ATP can be formed?

Bonus Answer: 3

==========

256. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which type of microscopy takes advantage of differences in the refractive index of biological materials and the surrounding medium to create an image without a stain?

W) scanning electron

X) transmission electron

Y) fluorescence

Z) phase-contrast

Toss Up Answer: Z

Bonus: Short Answer

What does MRSA stand for?

Bonus Answer: Methicillin-resistant Staphylococcus Aureus

==========

257. BIOLOGY

Writer: Siam Muquit

Toss Up: Multiple Choice

Which of these is not an accepted domain of life?

W) Archea

X) Bacteria

Y) Eukarya

Z) Protista

Toss Up Answer: Z

Bonus: Short Answer

What is the causative agent of Scrapie?

Bonus Answer: prion

==========

258. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Which type of cell has a large number of glycoproteins on the cell surface membrane?

W) Ciliated cell

X) Goblet cell

Y) Lymphocyte

Z) Red blood cell

Toss Up Answer: Y

Bonus: Short Answer

Name the bond that forms between glucose molecules in polysaccharides, such as amylose.

Bonus Answer: Glycosidic bond

==========

259. BIOLOGY

Writer: Jason Weng

Toss Up: Multiple Choice

Which of the following blood types has blood cells that possess antibodies for type A antigens?

W) A

X) AB

Y) B

Z) O

Toss Up Answer: Y

Bonus: Short Answer

Which molecule produced by alveolar cells cause the decrease in surface tension within alveoli?

Bonus Answer: Pulmonary surfactant

==========

260. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

Which human organ, comprised mostly of lymphoid, is essential for the growth of T cells?

Bonus Answer: Thymus

Bonus: Short Answer

What cells are responsible for forming blood platelets?

Bonus Answer: Megakaryocytes

==========

261. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is it called when a protein loses its 3-dimensional shape?

Bonus Answer: Denatured

Bonus: Short Answer

Of the 4, name all the following that are not common amino acids: histidine, isoleucine, glutamine, isovaline

Bonus Answer: Isovaline

==========

262. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

What light-sensitive cells in the eye detect colors?

W) Rods

X) Cones

Y) Retina

Z) Lens

Toss Up Answer: X

Bonus: Short Answer

What are the three types of cones?

Bonus Answer: blue, green, red (accept in any order)

==========

263. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What state was the first to use DNA to capture a serial rapist/murderer?

Bonus Answer: Virginia

Bonus: Short Answer

Who was the first murderer to be convicted on the basis of DNA evidence?

Bonus Answer: Timothy Wilson Spencer (accept Spencer, Timothy Spencer, Southside Strangler"

==========

264. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What state was the first to use DNA to exonerate an accused serial rapist/murderer?

Bonus Answer: Virginia

Bonus: Short Answer

Who was the first person to be exonerated based on contradictory DNA evidence?

Bonus Answer: David Vasquez

==========

265. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What is another name for the voice box?

Bonus Answer: Larynx

Bonus: Short Answer

Which part of the larynx is responsible for sound production?

Bonus Answer: Intrinsic laryngeal muscles (accept intrinsic, intrinsic muscles)

==========

266. BIOLOGY

Writer: Benjamin Avrahami

Toss Up: Multiple Choice

Which of the following is not an amino acid?

W) Threonine

X) Serine

Y) Diamine

Z) Lysine

Toss Up Answer: Y

Bonus: Short Answer

Giving your answer in millions of years ago, name one year that was in Romer's gap.

Bonus Answer: Between 345 and 360 (inclusive)

==========

267. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Birds are able to sustain long flights at high altitudes because they

W) can extract oxygen during both inhalation and exhalation

X) use anaerobic metabolism during flight

Y) are able to lower their body temperature during flight

Z) decrease their heart rate during flight

Toss Up Answer: W

Bonus: Multiple Choice

Carbon monoxide (CO) is toxic to humans because

W) it binds to myoglobin and causes it to denature.

X) it is rapidly converted to toxic CO_2.

Y) it binds to the globin portion of hemoglobin and prevents the binding of O_2.

Z) it binds to the Fe in hemoglobin and prevents the binding of O_2.

Bonus Answer: Z

==========

268. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

The fundamental cause of sickle-cell anemia is a change in the structure of
W) blood
X) capillaries
Y) red blood cells
Z) hemoglobin

Toss Up Answer: Z

Bonus: Multiple Choice
Which regulatory chemical stimulates gastric gland activity and motility?
W) Secretin
X) Gastrin
Y) Leptin
Z) Histamine

Bonus Answer: X

==========

269. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice
What is a fluid analogous to blood inmost vertebrates
W) Interstitial fluid
X) Hemolymphs
Y) Hemocyanin
Z) Plasma

Toss Up Answer: X

Bonus: Multiple Choice
Which of the following do not have a double circulatory system
W) Lizard
X) Human
Y) A bird
Z) A fish

Bonus Answer: Z

==========

270. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice
Which buffer system prevent large changes in pH in the blood during gas exchange
W) Hemoglobin
X) Phosphate
Y) Protein
Z) Bicarbonate

Toss Up Answer: Z

Bonus: Multiple Choice
How many ml of a 0.4 M HCl solution are required to bring the pH of 10 ml of a 0.4 M NaOH solution to 7.0 (neutral

pH)?
W) 4
X) 40
Y) 10
Z) 20

Bonus Answer: Y

==========

271. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Which statement about carbohydrate biosynthesis during the dark reactions of photosynthesis (i.e. the Calvin cycle reactions) is NOT TRUE?
W) RUBISCO is a an enzyme required for carbon dioxide fixation.
X) NADPH is the source of electrons for glucose synthesis.
Y) ATP is the energy source for glucose synthesis.
Z) The reactions occur in the photosynthetic membranes of chloroplasts.

Toss Up Answer: Z

Bonus: Short Answer

In the basic equation of photosynthesis for the synthesis of one molecule of a sugar such as glucose, how many molecules of carbon dioxide are required and how many molecules of oxygen are produced?

Bonus Answer: 6,6

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272. BIOLOGY

Writer: Benjamin Avrahami

Toss Up: Short Answer

What type of immune disease is SCID?

Bonus Answer: Immune deficiency disease

Bonus: Multiple Choice

Which one of the following classes of organisms has a pseudocoelom (pronounce soo-do-cee-lum)?
W) Calcarea
X) Ceriantharia
Y) Chromadorea
Z) Clitellata

Bonus Answer: Y

==========

273. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What type of organisms convert nitrogen-containing organic molecules into nitrates?

Bonus Answer: Decomposers

Bonus: Short Answer

What type of organisms comprise the greatest biomass in a terrestrial food chain?

Bonus Answer: Producers

==========

274. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What is the powerhouse of the cell?

Bonus Answer: Mitochondria

Bonus: Short Answer

Where does photosynthesis take place?

Bonus Answer: Chloroplast

==========

275. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

What type of plant has seeds?

W) Sperm

X) Angiosperm

Y) Gymnosperm

Z) Egg

Toss Up Answer: X

Bonus: Short Answer

By name or number, identify the characteristics that gymnosperms and angiosperms share from this list: leaves, stems, roots, and seeds

Bonus Answer: all of them

==========

276. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

Microspores of gymnosperms eventually develop into

W) seeds

X) cotyledons

Y) female gametophytes

Z) pollen grains

Toss Up Answer: Z

Bonus: Multiple Choice

Microspores of angiosperms eventually develop into

W) cotyledons

X) female gametophytes

Y) pollen grains

Z) archegonia

Bonus Answer: Y

==========

277. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

What type of joint allows for rotational movement?

Bonus Answer: ball-and-socket joint

Bonus: Short Answer

What type of joint allows for gliding or sliding movement?

Bonus Answer: plane joint

==========

278. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

A gene that is phenotypically expressed in the homozygous state but has its expression masked in the presence of a dominant gene is called:

Bonus Answer: recessive

Bonus: Multiple Choice

Sequences of DNA that are easily and naturally copied from one location in the genome and inserted elsewhere are called

W) jumping genes

X) crossing over genes

Y) recessive genes

Z) deletion genes

Bonus Answer: W

==========

279. BIOLOGY

Writer: Henry Zheng

Toss Up: Short Answer

Small, circular, double-stranded DNA molecules that naturally exist in bacterial cells and provide bacteria antibiotic resistance are called:

Bonus Answer: plasmids

Bonus: Multiple Choice

Small and round bacteria that grow in a chain are called

W) streptococci

X) staphylobacilli

Y) spirillium

Z) diplococci

Bonus Answer: W

==========

280. BIOLOGY

Writer: Henry Zheng

Toss Up: Multiple Choice

How many mature egg cells result from mitosis?

W) 0

X) 1

Y) 2

Z) 3

Toss Up Answer: W

Bonus: Multiple Choice

How many mature egg cells result from meiosis?

W) 0
X) 1
Y) 2
Z) 3

Bonus Answer: X

==========

281. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

When outside of the lymph vessel, the lymph is called
W) Interstitial Fluid
X) Hemocel
Y) Plasma
Z) Blood

Toss Up Answer: W

Bonus: Multiple Choice

Which of the following is not true about platelets
W) They are in involved in blood clotti
X) They are present in blood
Y) They are cells that broke away from megakaryocytes
Z) They have cytoplasm

Bonus Answer: Y

==========

282. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

The amino acid sequences encoded by the red and green visual pigment genes in humans are 96% identical. These two loci are found close together on the X chromosome. What mechanism most likely led to the evolution of these two genes?
W) Horizontal gene transfer followed by sequence divergence
X) Gene duplication followed by sequence divergence
Y) Inversion of the human X chromosome
Z) Polyploidization

Toss Up Answer: X

Bonus: Multiple Choice

Genetic drift is best described as:
W) evolutionary change due to natural selection.
X) changes in the proportion of homozygous recessive individuals due to random mating.
Y) a random change in allele frequencies that benefits the population.
Z) evolutionary change due to random events.

Bonus Answer: Z

==========

283. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

SNPs can be characterized by all of the following EXCEPT for:

W) always causing diseases.

X) being common in a population.

Y) acting as a point mutation.

Z) acting as a transition mutation.

Toss Up Answer: W

Bonus: Short Answer

Which of the following cells are phagocytic?

1.Megakerocyte

2.Dendritic cells

3.Natural killer cells

4.Neutrophils

5.Monocytes

Bonus Answer: 2, 4, 5

(Dendritic cells, Neutrophils, Monocytes)

==========

284. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

A female lizard washes ashore on an island after riding a floating log for hundreds of miles across the sea. She is the only member of her species to have ever made it to the island. After arriving, she lays 20 fertile eggs that hatch and form the basis of a lizard population on the island. Which of the following is NOT a likely result?

W) The new island population will have less genetic diversity than the ancestral population.

X) Mutation will add new alleles to the new population and thus increase its genetic diversity over time.

Y) There will be little or no gene exchange between the new population and the ancestral population.

Z) The new island population will have greater genetic diversity than the ancestral population.

Toss Up Answer: Z

Bonus: Multiple Choice

Loss of heterozygosity can be caused by all of the following EXCEPT:

W) genetic drift.

X) positive frequency-dependent selection.

Y) heterozygote advantage.

Z) inbreeding.

Bonus Answer: Y

==========

285. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Which of the following processes in cellular respiration produce the most ATP

W) Glycolysis

X) Link Reaction

Y) Krebs Cycle

Z) Oxidative Phosphorylation

Toss Up Answer: Z

Bonus: Multiple Choice

Which of the following is not used in cellular respiration

W) Glucose

X) NADH

Y) FADH2

Z) NADPH

Bonus Answer: Z

==========

286. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Surfactant helps to prevent the alveoli from collapsing by:

W) humidifying the air before it enters

X) Reducing the surface tension of alveolar fluid

Y) warming the air before it enters

Z) protecting the surface of alveoli from dehydration and other environmental variations

Toss Up Answer: X

Bonus: Multiple Choice

Respiratory control centers are located in the

W) midbrain and medulla

X) pons and midbrain

Y) medulla and pons

Z) upper spinal chord and medulla

Bonus Answer: Y

==========

287. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What organelle in a human cell is responsible for breaking down waste material?

Bonus Answer: Lysosome

Bonus: Short Answer

Order the following from the least specific to the most: Species, Family, Order, Phylum

Bonus Answer: Phylum, Order, Family, Species (4, 3, 2, 1)

==========

288. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

How many subunits does a tubulin protein have?

Bonus Answer: 2

Bonus: Short Answer

The blood enter systemic circulation via the aorta, and returns to the heart via what common vein?

Bonus Answer: Vena Cava (accept superior or inferior vena cava)

==========

289. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

Into what common vein does lymph dump into to bring it back into circulation?

Bonus Answer: Subclavian vein

Bonus: Short Answer

Usually, what functional group is added to molecules as part of the detoxification process in the ER to allow it to be urinated out?

Bonus Answer: Hydroxyl Group (OH group)

==========

290. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What type of circulation is between the heart and the lungs?

Bonus Answer: Pulmonary circulation

Bonus: Short Answer

As what form of ion does carbon dioxide travel as in the blood?

Bonus Answer: Bicarbonate ion (HCO3-)

==========

291. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

The group of cells that break down bone cells are collectively called as what?

Bonus Answer: Osteoclast

Bonus: Short Answer

What class of immunoglobulins are present in tears, saliva, etc?

Bonus Answer: IGA

==========

292. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

In plant cells grown in the presence of a metabolic poison that
specifically inhibits mitochondrial F1 ATP synthase, one would expect:
W) the pH difference across the cristae to be greater than normal.
X) the pH difference across the cristae to be less than normal.
Y) the electron transport chain to become inoperative.
Z) oxygen consumption to cease.

Toss Up Answer: W

Bonus: Short Answer

With proofreading, what is approximately the error rate of DNA
polymerase?

Bonus Answer: One error in every 10^9 bases.

==========

293. BIOLOGY

Writer: Josh Tish

Toss Up: Short Answer

During the late Carboniferous period, terrestrial arthropods such as Hexapoda, Myriapoda, and Arachnida showed great diversity in form and size. Why are modern day arthropods are much smaller than their Carboniferous ancestors?

Bonus Answer: decreased volume of oxygen in the atmosphere in modern times versus comparatively higher volume of oxygen present during Carboniferous Era

---

Bonus: Short Answer

Arrange the following five events in the order that explains the bulk flow of substances in the phloem.

1. Sugar moves down the stem.
2. Leaf cells produce sugar by photosynthesis.
3. Sugar is transported from cell to cell via the apoplast and/or symplast.
4. Solutes are actively transported into sieve elements.
5. Water diffuses into the sieve tube elements.

Bonus Answer: 2,3,4,1,5

==========

294. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

If active transport is inhibited, the passive sodium and potassium ion fluxes across the plasma membrane are still coupled. What makes these two passive ion fluxes dependent on each other?

W) The membrane potential.
X) The potassium channels.
Y) The ratio of cholesterol to phospholipids in the membrane.
Z) The pumping ratio of the Na+/K+ ATPase.

Toss Up Answer: W

Bonus: Multiple Choice

If a carboxylic acid has a pKa of 3.9, what percentage of the functional group will carry a negative charge at pH 4.9?

W) 10%
X) 90.90%
Y) 9.09%
Z) 50%

Bonus Answer: X

==========

295. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

The majority of proteins exist as homo-oligomers rather than hetero-oligomers. Which of the following is not a reason that quaternary structures are homo-oligomers?

W) Aggregation of identical subunits gives rise to symmetry and possible allosteric interactions.
X) A slow post-translational process favors a quaternary structure with the homo-oligomers held together by covalent bonds.

Y) Homodimers may increase binding specificity and stability.
Z) Homo-oligomerization results in a genetic savings with lower energy demand.

Toss Up Answer: X

Bonus: Multiple Choice
Which of the following is not an action of epinephrine or norepinephrine?
W) Glycogen broken down to glucose.
X) Increased gastric motility and secretion.
Y) Increased blood pressure.
Z) Increased salivation.

Bonus Answer: X

==========

296. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice
Select the description that most correctly describes the term recessive:
W) A weak phenotype.
X) An allele that confers a weak phenotype.
Y) A phenotype conferred when only one copy of an allele is present.
Z) A phenotype conferred when two copies of an allele are present.

Toss Up Answer: Z

Bonus: Multiple Choice
Which of the following interactions is most responsible for the structural stability of soluble globular proteins?
W) Dipole-dipole interactions.
X) Electrostatic interactions.
Y) Hydrogen bonds.
Z) The Hydrophobic Effect.

Bonus Answer: Z

==========

297. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice
Using accelerator mass spectrometry, the 14C atoms in a 2 mg bone fragment were directly counted and found to be 1/8 of those that would be present in a 2 mg bone fragment in 1950. What is the approximate age of this specimen?
W) 1,540 years
X) B. 5,730 years
Y) C. 17,190 years
Z) D. 22,920 years

Toss Up Answer: Y

Bonus: Multiple Choice

Positive cooperativity is an emergent property of what type of
enzymatic regulatory mechanism?
W) Allosteric interactions.
X) Cellular compartmentalization.
Y) Genetic regulatory mechanisms.
Z) Second messenger systems.

Bonus Answer: W

==========

298. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

The chemical EDTA is routinely used in many experiments. For
example, EDTA is used in electrophoresis buffer solutions. Which of
the following statements is not true?
W) EDTA has a strong binding affinity for divalent and some trivalent cations.
X) EDTA is a catalyst for polymer formation and essential for protein and nucleic acid polymerization.
Y) EDTA is a chelator.
Z) EDTA is used to help denature proteins and weaken cell membranes.

Toss Up Answer: X

Bonus: Multiple Choice

Which of the following statements is not true?
W) Insects, birds, and many reptiles excrete nitrogenous waste in the form of urea.
X) Neurons have evolved to speed the communication between distant cells in multi-cellular organisms.
Y) Synapses are specialized connections between neurons to facilitate the formation of complex neuronal networks.
Z) The regulatory proteins tropomysin and troponin control the contraction of contractile filaments, actin and myosin.

Bonus Answer: W

==========

299. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

When the temperature increases, which of the following statements
is not true?
W) Dissolved oxygen decreases at higher temperatures and higher salinity.
X) Many corals die when the temperature exceeds 86°F.
Y) Metabolic reactions are less likely to achieve their activation energy.
Z) The amount of carbon dioxide that can be absorbed by the ocean decreases.

Toss Up Answer: Y

Bonus: Multiple Choice

Which of the following carbohydrates contain α-1, 4-linkages?
W) amylose
X) Cellulose
Y) Deoxyarabinose

Z) Glucose

Bonus Answer: W

==========

300. BIOLOGY

Writer: Hanna Yang

Toss Up: Multiple Choice

What is the name of the first livestock virus eradicated by a vaccine?

W) Smallpox

X) Polio

Y) Rinderpest

Z) Mumps

Toss Up Answer: Y

Bonus: Short Answer

By mass, what element makes up most of the human body?

Bonus Answer: Oxygen

==========

301. BIOLOGY

Writer: Hanna Yang

Toss Up: Multiple Choice

Some birds, such as pigeons and doves secrete "milk" that they feed to their children. From which of the following organs does it come from?

W) Crop

X) Gizzard

Y) Mammary Gland

Z) Stomach

Toss Up Answer: W

Bonus: Short Answer

What is the common name for Columba livia?

Bonus Answer: Feral/City/Street pigeon

==========

302. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

All of the following processes involve hydrogen bonding except

W) DNA replication

X) Protein folding

Y) Formation of ice crystals

Z) Binding of an enzyme and substrate

Toss Up Answer: Z

Bonus: Multiple Choice

Which of these is not an example of eukaryotic post-transcriptional modification?

W) The 3' end of the growing strand is cleaved

X) After splicing, exons are rejoined to make a final mRNA transcript

Y) Exons, non-coding regions, are removed via splicing

Z) A poly-A tail is added to the 5' end

Bonus Answer: Y

==========

303. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

From where do autotrophs obtain their carbon, nutrients, and minerals?

W) From the sun

X) From human activities

Y) The inorganic environment

Z) From the atmosphere

Toss Up Answer: Y

Bonus: Short Answer

What is the name of the parasite that causes malaria?

Bonus Answer: Plasmodium parasites (also accept plasmodium)

==========

304. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

The vision of a person with myopia can be corrected with which type of lens?

Bonus Answer: diverging, concave

Bonus: Short Answer

What is the name of the surgical procedure in which cuts are made around the cornea to allow for the correction of myopia?

Bonus Answer: Radial keratotomy

==========

305. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What are the names of the two bones in your forearm?

Bonus Answer: radius and ulna

Bonus: Short Answer

How many carpal bones does a person have in each arm?

Bonus Answer: 8

==========

306. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

Which scientist is often considered the father of microbiology?

Bonus Answer: Leeuwenhoek

Bonus: Short Answer

Which English scientist coined the word "cell"?

Bonus Answer: Robert Hooke, Hooke

==========

307. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the liquid underneath the cornea called?

Bonus Answer: aqueous humor

Bonus: Short Answer

What is the jellylike tissue behind the lens called?

Bonus Answer: vitreous humor

==========

308. BIOLOGY

Writer: Larry Wong

Toss Up: Multiple Choice

What is the scientific name for a perentie?

W) Varnus giganteus

X) Lupus canis

Y) Faunus Lacerta

Z) Varnus priscus

Toss Up Answer: W

Bonus: Short Answer

What does HIV stand for?

Bonus Answer: Human Immunodeficiency Virus

==========

309. BIOLOGY

Writer: Kerwin Chen

Toss Up: Short Answer

What is the medical term for lazy eye?

Bonus Answer: amblyopia

Bonus: Short Answer

What is the medical term for the clouding of the lens of the eye?

Bonus Answer: cataracts

==========

310. BIOLOGY

Writer: Ivan Zhang

Toss Up: Multiple Choice

What makes the fur of polar bears white?

W) White pigment

X) No pigment and transparency of fur

Y) White pigment and transparency of fur

Z) Transparency of fur

Toss Up Answer: X

Bonus: Short Answer

The term superbugs is usually used to refer to what?

Bonus Answer: Antibiotic-resistant bacteria

==========

311. BIOLOGY

Writer: Larry Wong

Toss Up: Short Answer

What branch of biology deals with the study of insects?

Bonus Answer: Etomology

Bonus: Multiple Choice

Which animal does not belong to phylum chordata?

W) Alligator

X) ostrich

Y) octopus

Z) shark

Bonus Answer: Y

==========

312. BIOLOGY

Writer: Shamaul Dilmohamed

Toss Up: Short Answer

The chromosomes responsible for characteristics other than sex are known by what name?

Bonus Answer: Autosomes

Bonus: Short Answer

What is the term given to enzymes whose action is modulated by binding of a molecule to a site other than the active site?

Bonus Answer: allosteric enzymes

==========

313. BIOLOGY

Writer: Shamaul Dilmohamed

Toss Up: Short Answer

What is the name given to the jellylike substance filling the chamber behind the lens of the human eye?

Bonus Answer: vitreous humor

Bonus: Short Answer

Name the clear watery liquid that surrounds the brain and spinal cord and fills the four cavities or ventricles of the brain.

Bonus Answer: Cerebrospinal Fluid

==========

314. BIOLOGY

Writer: Banpreet Singh

Toss Up: Short Answer

The Jabberwock lived in what wood?

Bonus Answer: tulgey wood

Bonus: Short Answer

Ancient insects were sometimes trapped in amber, a fossil resin from cone-bearing, evergreen, needle-leaved trees collectively known as

Bonus Answer: conifers

==========

315. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

In what region f the upper digestive tract does food become chyme?
W) The esophagus
X) The stomach
Y) The sublingual salivary glands
Z) The mouth
Toss Up Answer: X

Bonus: Short Answer
A codon in an mRNA sequence is 5'-AAC-3'. What is the corresponding tRNA anticodon?
Bonus Answer: 3'-GUU-5' (Note: do not accept GUU and ' stands for prime)

==========

316. BIOLOGY

Writer: Banpreet Singh
Toss Up: Short Answer
When you alphabetize the major body systems, which is last?
Bonus Answer: skeletal

Bonus: Short Answer
Fill in the blank. The medulla oblongata controls blank muscle action
Bonus Answer: involuntary

==========

317. BIOLOGY

Writer: Nten Nylam
Toss Up: Multiple Choice
What type of mutation does not change an organism's phenotype despite changing its genotype
W) Missense
X) Frameshift
Y) Silent
Z) Nonsense

Toss Up Answer: Y

Bonus: Multiple Choice
Which enzyme is not involved in DNA replication?
W) Lipase
X) Gyrase
Y) Helicase
Z) DNA polymerase

Bonus Answer: W

==========

318. BIOLOGY

Writer: Nten Nylam
Toss Up: Short Answer
What is the name of the process in which an RNA copy of a gene sequence is made, involving the enzyme RNA polymerase
Bonus Answer: Transcription

Bonus: Short Answer
What type of bonding is found in a disulfide bridge?

Bonus Answer: Covalent bonding (also accept covalent)

==========

319. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Which of the following is not one of the basic tastes

W) sweetness

X) saltiness

Y) umami

Z) spiciness

Toss Up Answer: Z

Bonus: Multiple Choice

In classical conditioning, an unlearned, inborn reaction to an unconditioned stimulus is a(n)

W) unconditioned stimulus

X) conditioned stimulus

Y) conditioned response

Z) unconditioned response

Bonus Answer: Z

==========

320. BIOLOGY

Writer: Mohammed Jamil

Toss Up: Multiple Choice

Where does the electrical signal in the heart start

W) sinoatrial node

X) atrioventricular node

Y) atrioventricular bundle

Z) purkinje fibers

Toss Up Answer: W

Bonus: Multiple Choice

Which valve separates the right atrium from the right ventricle

W) Mitral Valve

X) Tricuspid valve

Y) Bicuspid Valve

Z) Semi-lunar valves

Bonus Answer: X

==========

321. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

A person with type A blood has children with a person with type AB blood. What possible blood types can their offspring be?

W) A only

X) A and AB

Y) A, B, and AB

Z) A, AB, and O

Toss Up Answer: Y

Bonus: Multiple Choice

What sex chromosome system determines gender in birds?

W) X-Y system

X) X-0 system (read as X-zero)

Y) Z-W system

Z) haplo-diploid system

Bonus Answer: Y

==========

322. BIOLOGY

Writer: Matthew Lee

Toss Up: Multiple Choice

Which one of the following is hexaploid?

W) apple

X) wheat

Y) strawberry

Z) banana

Toss Up Answer: X

Bonus: Short Answer

What is the only animal known to reproduce asexually?

Bonus Answer: Bdelloid rotifer

==========

323. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

Chronic myelogenous leukemia can occur when a portion of chromosome 9 translocated with chromosome 22. What is this abnormal version of chromosome 22 commonly called?

Bonus Answer: Philadelphia chromosome

Bonus: Multiple Choice

If nondisjunction occurs in a cell during meiosis I, how many of the 4 daughter cells will have an abnormal chromosome number?

W) 1

X) 2

Y) 3

Z) 4

Bonus Answer: Z

==========

324. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What model of DNA replication did Watson and Crick propose?

Bonus Answer: Semiconservative model

Bonus: Multiple Choice

What enzyme replaces RNA primers with DNA during DNA replication?

W) DNA polymerase I

X) DNA polymerase III

Y) Primase

Z) DNA ligase

Bonus Answer: W

==========

325. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What is the repeated 6-base DNA sequence of a human telomere?

Bonus Answer: TTAGGG

Bonus: Multiple Choice

Which histone is involved in the formation of the 30-nm chromatin fiber during chromatin packing?

W) H3

X) H2B

Y) H4

Z) H1

Bonus Answer: Z

==========

326. BIOLOGY

Writer: Matthew Lee

Toss Up: Short Answer

What fatal, degenerative disease caused by a prion is most commonly found in sheep and goats?

Bonus Answer: scrapie

Bonus: Short Answer

What fatal, degenerative disease caused by a prion is most commonly found in people?

Bonus Answer: Creutzfeldt-Jakob disease

==========

327. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Which of the following would lead to a DECREASE in activity of the Anterior Pituitary gland?

W) A lack of receptors for Cortisol on the Hypothalamus.

X) A lack of receptors for Cortisol on the Anterior Pituitary.

Y) Intravenous injection of a large amount of ACTH.

Z) A tumor of the Hypothalamus causing it to secrete excess Corticotropin- Releasing Hormone

Toss Up Answer: Y

Bonus: Multiple Choice

What would happen if the Adrenal Cortex was artificially stimulated to produce large amounts of Cortisol?

W) Less Corticotropin-Releasing Hormone would be released.

X) More ACTH would be released.
Y) The activity of the Hypothalamus would increase.
Z) The activity of the Anterior Pituitary would increase.

Bonus Answer: W

==========

328. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Polarity in the developing Drosophila embryo is determined by:
W) a protein gradient of the segmentation protein engrailed
X) a protein gradient of the bicoid protein expressed from maternal mRNA
Y) a protein gradient of the gap protein hunchback
Z) expression of the segmentation protein engrailed throughout the embryo

Toss Up Answer: X

Bonus: Multiple Choice

When a four-cell Xenopus embryo is divided into ventral and dorsal halves,
the half containing the Nieuwkoop center will develop:
W) ventralized features
X) dorsalized features
Y) as a normal embryo
Z) only to the 8-cell stage

Bonus Answer: X

==========

329. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

Insulin release results in all of the following physiological effects EXCEPT:
W) Decreased glycogen stores in liver cells.
X) Activation of glycogen synthase.
Y) Inhibition of glycogen phosphorylase.
Z) Increased fat production from glycerol and fatty acids in adipose tissue.

Toss Up Answer: W

Bonus: Multiple Choice

All of the following are stimulated by the sympathetic nervous system
EXCEPT:
W) increased heart rate.
X) increase secretion of the sweat glands.
Y) constriction of blood vessels
Z) increased peristalsis in the gastrointestinal tract.

Bonus Answer: Z

==========

330. BIOLOGY

Writer: Josh Tish

Toss Up: Multiple Choice

In the genetic pathway containing genes A, B, and C, gene A negatively regulates gene B, which in turn negatively regulates gene C. If a loss-of-function mutation were introduced into gene B, what would be the resulting effect on the expression of gene C?

W) Decreased expression of gene C.
X) No effect on expression of gene C.
Y) Changes in expression levels of gene C would be the same as those for gene A.
Z) Increased expression of gene C.

Toss Up Answer: Z

Bonus: Multiple Choice

Concentration of urine is essential to the survival of many vertebrates. Which class of vertebrates would you expect does not use this mechanism for homeostasis?

W) Aves
X) Lepidosauria
Y) Mammalia
Z) Osteichthyes

Bonus Answer: Z

==========

331. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is the process called by which tumor spreads to other parts of the body?

Bonus Answer: Metastasis

Bonus: Short Answer

How many subunits does tubulin have?

Bonus Answer: 2

==========

332. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Where do the microtubules of the spindle originate during mitosis in both plant and animal cells?

W) centromere
X) centrosome
Y) centriole
Z) kinetochore

Toss Up Answer: Y

Bonus: Multiple Choice

If cells in the process of dividing are subjected to colchicine, at which stage will mitosis be arrested?

W) anaphase
X) prophase
Y) metaphase
Z) interphase

Bonus Answer: Y

==========

333. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following is required for motor proteins to function in the movement of chromosomes toward the poles of the mitotic spindle?

W) intact centromeres

X) a kinetochore attached to the metaphase plate

Y) ATP as an energy source

Z) synthesis of cohesin

Toss Up Answer: Y

Bonus: Short Answer

At which phase are centrioles beginning to move apart in animal cell mitosis?

Bonus Answer: prophase (DO NOT ACCEPT: prometaphase)

==========

334. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following proteins are involved in binary fission as well as eukaryotic mitotic division?

W) cyclins

X) Cdks (read as an acronym)

Y) condensins

Z) actin and tubulin

Toss Up Answer: Z

Bonus: Short Answer

The materials used to synthesize a new cell wall in plant cell cytokinesis comes primarily from which plant cell organelle?

Bonus Answer: Golgi apparatus (ACCEPT: Golgi complex, Golgi body, Golgi)

==========

335. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Which cyclin-CdK complex triggers the cell's passage past the G2 checkpoint into mitosis?

Bonus Answer: MPF (ACCEPT: mitosis promoting factor, maturation promoting factor)

Bonus: Short Answer

In which cell cycle phase does the most important checkpoint, also called the restriction point, occur?

Bonus Answer: G1 (ACCEPT: between G1 and S)

==========

336. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

The MPF protein complex turns itself off in the cell cycle by

W) activating a process that destroys its cyclin components

X) activating an enzyme that stimulates cyclin

Y) binding to chromatin

Z) activating the anaphase-promoting complex

Toss Up Answer: W

Bonus: Short Answer

The cyclin component of MPF is destroyed toward the end of which cell cycle phase?

Bonus Answer: M phase (ACCEPT: mitosis, mitotic phase)

==========

337. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following types of cells do not exhibit density-dependent inhibition concerning reproduction?

W) neurons

X) cells in your liver

Y) cells in a malignant tumor

Z) cells surrounding your stomach

Toss Up Answer: Y

Bonus: Short Answer

Which cell part is most directly responsible for detecting the cell density of its surrounding area in order for the cell to exhibit density-dependent inhibition?

Bonus Answer: extracellular matrix

==========

338. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Fluctuations in the concentration of which of the following molecules is most responsible for transitioning between the phases of the cell cycle?

W) Cyclin-dependent kinases

X) potassium ions

Y) sucrose

Z) cyclins

Toss Up Answer: Z

Bonus: Multiple Choice

What occurs after the M phase checkpoint in the cell cycle?

W) Cohesins alter separase to allow chromatids to separate.

X) Separase enzyme cleaves cohesins and allows chromatids to separate.

Y) Kinetochores are able to bind to spindle microtubules.

Z) Daughter cells are allowed to pass into G1.

Bonus Answer: X

==========

339. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Asexual prokaryotic cell division occurs via which process?

Bonus Answer: binary fission

Bonus: Multiple Choice

Mitosis in protists differ from other forms of eukaryotic mitosis in which way?
W) Microtubules attach to the chromosome kinetochores.
X) Chromosomes are condensed in prophase.
Y) The nuclear envelope is not disassembled and remains intact throughout the process.
Z) Sister chromatids cross over.

Bonus Answer: Y

==========

340. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

At which stage of mitosis are chromosomes usually photographed in order to produce a karyotype?

Bonus Answer: metaphase

Bonus: Short Answer

Name all of the following that a homologous pairs of chromosomes share in common.
I. length
II. loci of genes
III. characteristics encoded by their genes
IV. DNA sequence

Bonus Answer: I, II, III only

==========

341. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

The synaptonemal complex forms in which phase of meisois?

Bonus Answer: Prophase I (DO NOT ACCEPT: prophase, prophase II)

Bonus: Multiple Choice

Which of the following best describes the frequency of crossing over in animals?
W) ~50 per chromosome pair
X) ~2 per meiotic cells
Y) ~1 per pair of sister chromatids
Z) at least 1-2 per chromosome pair

Bonus Answer: Z

==========

342. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

Which of the following is not true about genetically modified food?
W) genetically modified organisms are generally safe for human consumption
X) over 80 % of corn grown in the US is genetically modified
Y) genetically modified crops require larger amounts of pesticides
Z) genetically modified crops can yield greater harvests for less cost

Toss Up Answer: Y

Bonus: Short Answer

Bt corn is genetically modified to produce a certain protein that is poisonous to certain insects. What is the genus of the source of the genetic material that produces this corn?

Bonus Answer: Bacillus

==========

343. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

Which of the following is not an phyla in the kingdom animalia?

W) Chordata

X) Lycophyta

Y) Bryozoa

Z) Cnidaria

Toss Up Answer: X

Bonus: Short Answer

What is the order of the house mouse, mus musculus?

Bonus Answer: Rodentia

==========

344. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Short Answer

Ruminants have the ability to digest what substance due to microorganisms in the stomach?

Bonus Answer: Cellulose

Bonus: Short Answer

What is the main site of methane production in ruminants?

Bonus Answer: Rumen, accept first chamber/stomach

==========

345. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

What does it mean when an organism that can self-fertilize is true breeding?

W) the organism will produce offspring that are genetically identical to it

X) the organism's offspring will all be genetically identical to each other

Y) the organism is heterozygous for the gene that controls that trait

Z) the organism's offspring will have the same phenotype for a certain trait

Toss Up Answer: Z

Bonus: Short Answer

Gregor Mendel is known as the father of modern genetics due to his work with pea plants. Which of the following traits did he study: plant height, pod color, leaf shape, flower position?

Bonus Answer: All except leaf shape

==========

346. BIOLOGY

Writer: Shanjeed Ali

Toss Up: Multiple Choice

Carpal tunnel syndrome is caused by

W) wear of cartilage in the wrist

X) stress in the lateral epicondyle

Y) pressure on the median nerve

Z) partial tear of the extensor digitorum

Toss Up Answer: Y

Bonus: Multiple Choice

Which of the following has not been shown to increase the likelihood of carpal tunnel syndrome?

W) obesity

X) repetitive wrist motion

Y) rheumatoid arthritis

Z) hyperextension

Bonus Answer: Z

==========

347. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is the process of removing the base of a nucleotide?

Bonus Answer: Depurination

Bonus: Short Answer

Out of the 3, which of them uses an electron transport system: fermentation, anaerobic respiration, aerobic respiration

Bonus Answer: anaerobic respiration, aerobic respiration (2,3)

==========

348. BIOLOGY

Writer: Olivia Gallager

Toss Up: Multiple Choice

Which of the following describes the inheritance pattern of Huntingtons Disease?

W) Autosomal Recessive

X) X Linked Recessive

Y) Y linked

Z) Autosomal dominant

Toss Up Answer: Z

Bonus: Short Answer

Cystic fibrosis is a genetic disease that affects the lungs and other mucus membranes through the absence or deformation of certain ion channels. Which ion do these channels allow to flow, in people without cystic fibrosis?

Bonus Answer: Chloride, accept chlorine

==========

349. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

If all fungi in an environment that perform decomposition were to suddenly die, then which group of organisms should benefit most, due to the fact that their fungal competitors have been removed?

W) Prokaryotes

X) Plants

Y) animals

Z) fungi

Toss Up Answer: X

Bonus: Multiple Choice

When a mycelium infiltrates an unexploited source of dead organic matter, what are most likely to appear within the

food source soon thereafter?
W) soredia
X) fungal enzymes
Y) fungal haustoria
Z) larger bacterial populations

Bonus Answer: X

==========

350. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Short Answer

Both fungus-farming ants and their fungi can synthesize the same structural polysaccharide from the β-glucose. What is this polysaccharide?

Bonus Answer: Chitin

Bonus: Short Answer

Plasmogamy can directly result in which of the following? 1. cells with a single haploid nucleus 2. heterokaryotic cells 3. dikaryotic cells 4. cells with two diploid nuclei

Bonus Answer: 2 and 3

==========

351. BIOLOGY

Writer: Ahmad Alnasser

Toss Up: Multiple Choice

The structure of bone tissue suits the function. Which of the following bone tissues is adapted to support weight and withstand tension stress?
W) Spongy bone
X) Irregular bone
Y) Compact bone
Z) Trabecular bone

Toss Up Answer: Y

Bonus: Short Answer

Which hormone increases osteoclast activity to release more calcium ions into the bloodstream?

Bonus Answer: Parathyroid Hormone

==========

352. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

Bob's mother had Cystic Fibrosis, and his father was a carrier, but Bob is unaffected. If Cynthia's parents were both carriers of Cystic Fibrosis, then what is the probability, expressed as a simple fraction, of Bob and Cynthia having a child with CF?

Bonus Answer: 1/8

Bonus: Multiple Choice

Marfan's Syndrome exhibits which Mendelian inheritance pattern?
W) Abe Lincoln
X) X-linked recessive
Y) Autosomal Recessive
Z) Autosomal Dominant

Bonus Answer: Z

==========

353. BIOLOGY

Writer: Olivia Gallager

Toss Up: Short Answer

Out of the following, by name or number, which are considered gram positive: Influenza, Bacillus Anthracis, Escherischia Coli, and Bordetella Pertussis

Bonus Answer: 2, Bacillus Anthracis

Bonus: Short Answer

What is the main immunoglobulin found in mucous secretions?

Bonus Answer: igA, immunoglobulin A

==========

354. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is the part of the nucleus that contains chromosomes?

Bonus Answer: Chromatin

Bonus: Short Answer

What are lymphatic vessels called that are present in the intestines to absorb nutrients?

Bonus Answer: Lacteals

==========

355. BIOLOGY

Writer: Jason Weng

Toss Up: Multiple Choice

To which part of the body are the parathyroid gland closes to?

W) Chest

X) Head

Y) Neck

Z) Abdomen

Toss Up Answer: Y

Bonus: Short Answer

What macromolecules do ubiquitins bind to to signal their degradation?

Bonus Answer: Proteins

==========

356. BIOLOGY

Writer: Jason Weng

Toss Up: Short Answer

What is the a possible normal pH of the stomach?

Bonus Answer: 1 or 2 or 3

Bonus: Short Answer

What is the maximum net number of ATP produced by a glucose molecule from substrate level phosphorylation?

Bonus Answer: 4

==========

357. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

In a DNA molecule what do the letters A, C, T, and G commonly symbolize?
W) nitrogenous bases
X) phosphate ions
Y) proteins
Z) sugars

Toss Up Answer: W

Bonus: Multiple Choice
What is the role of DNA molecules in the synthesis of a protein?
W) They catalyze the formation of bonds between amino acids
X) They provide the enery necessary to perform protein synthesis
Y) They transfer amino acids from the cytoplasm to the nucleus
Z) They determine the sequence of amino acids in a protein

Bonus Answer: Z

==========

358. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice
DNA can be cut into small pieces with
W) introns
X) restriction enzymes
Y) exons
Z) RNA

Toss Up Answer: X

Bonus: Short Answer
If guanine makes up 28 percent of the nucleotides in a sample of DNA from an organism, then thymine makes up ___ (blank) percent of the nucleotides.

Bonus Answer: 22 (also accept 22 percent)

==========

359. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice
Microtubules
W) allow an amoeba to send out a pseudopod
X) are made of actin and aid in supporting the shape of the cell
Y) are made of myosin and aid in skeletal muscle contractions
Z) are hollow tubes that make up cilia and flagella

Toss Up Answer: Z

Bonus: Multiple Choice
Which of the following involve growing living cells?
W) Freeze-etching
X) Cell fractionation
Y) Tissue culture
Z) Apoptosis

Bonus Answer: Y

==========

360. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

All of the following are related to blood clotting

W) fibrinogen

X) erythrocytes

Y) thromboplastin

Z) calcium ions

Toss Up Answer: X

Bonus: Multiple Choice

Absorption of nutrients occurs in the

W) stomach

X) beginning of the small intestine

Y) latter part of the small intestine

Z) rectum

Bonus Answer: Y

==========

361. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

Gastric enzymes work best in an environment with a pH of

W) 3

X) 6

Y) 7

Z) 11

Toss Up Answer: W

Bonus: Short Answer

What part of the human digestive system begins the digestion of proteins?

Bonus Answer: Stomach

==========

362. BIOLOGY

Writer: Nten Nylam

Toss Up: Multiple Choice

Which is an example of passive immunity?

W) Becoming resistant to a viral infection once you have recovered from it

X) Nursing babies receiving antibodies from their mother

Y) Becoming resistant to mumps after receiving the mumps vaccine

Z) People with AIDS having antibodies against the virus, but still being succeptible to disease

Toss Up Answer: X

Bonus: Multiple Choice

Reverse transcriptase can be found in

W) T lymphocytes

X) antibodies
Y) HIV virus
Z) macrophages

Bonus Answer: Y

==========

363. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

Which biome contains the greatest diversity of species?

Bonus Answer: Tropical rain forest (accept rain forest)

Bonus: Short Answer

Which biome's characteristics include large mammals, such as black bear and elk, and conifer forests

Bonus Answer: taiga (also accept boreal forsest, snow forest, or temperate forest)

==========

364. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

What is the name of the lining of the uterus?

Bonus Answer: endometrium

Bonus: Short Answer

In which phase of the menstrual cycle does the follicle secondary oocyte (OH-OH-SITE) rupture out of the ovary?

Bonus Answer: ovulation

==========

365. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

What hormone is released by the anterior pituitary and directly causes ovulation?

Bonus Answer: Lutenizing hormone (accept LH)

Bonus: Short Answer

What part of the chicjck egg is analogous to the placenta; where nitrogenous waste accumulates?

Bonus Answer: Allantois

==========

366. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

Skeletal bones derive from which embryonic germ layer?

Bonus Answer: Mesoderm

Bonus: Short Answer

In which phase of mitosis does a dividing cell spend most of its time?

Bonus Answer: Interphase

==========

367. BIOLOGY

Writer: Nten Nylam

Toss Up: Short Answer

What is produced by the lacrimal glands?

Bonus Answer: Tears

Bonus: Short Answer

Rods and cones can be found in which tissue layer of the human eye?

Bonus Answer: Retina

==========

368. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Embryological cell differentiation and pattern formation is not directly determined by which of the following?

W) cytoplasmic determinants in the mother egg cell

X) morphogens

Y) catabolite activator protein

Z) homeotic genes

Toss Up Answer: Y

Bonus: Short Answer

Epigenetic inheritance is most commonly caused by modifications to which structures or molecules?

Bonus Answer: chromatin (ACCEPT: histones)

==========

369. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which molecule or molecules tags proteins for degradation by proteasomes?

W) ubiquinone

X) ubiquitin

Y) control elements

Z) spliceosomes

Toss Up Answer: X

Bonus: Short Answer

Name all of the following RNA molecules that DO NOT degrade mRNA transcription or block its translation.

(1) siRNA

(2) piRNA

(3) miRNA

(4) snRNA

Bonus Answer: piRNA, snRNA (2, 4)

==========

370. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Barr bodies exist as what structure in the nucleus?

W) euchromatin

X) acetylated histones

Y) heterochromatin

Z) circular DNA

Toss Up Answer: Y

Bonus: Short Answer

In histone acetylation, acetyl groups attach to which amino acid of the histone tails?

Bonus Answer: lysine

==========

371. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

The trpR gene codes for

W) an inactive repressor

X) an active repressor

Y) catabolite activator protein

Z) a corepressor

Toss Up Answer: W

Bonus: Multiple Choice

Which of the following statements incorrectly characterizes a basic bacterial operon?

W) The gene loci of the operon are continuous.

X) The operator is a component of the promoter region.

Y) The operator does not code for a gene product.

Z) The regulatory gene is always adjacent to the promoter.

Bonus Answer: Z

==========

372. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Amino acids are attached to their respective tRNA molecules by which enzyme?

Bonus Answer: aminoacyl-tRNA synthetase

Bonus: Short Answer

Which high energy molecule is responsible for forming the peptide bonds during translation elongation?

Bonus Answer: GTP (ACCEPT: guanosine triphosphate)

==========

373. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Name all of the following genetic disorders that exhibit dominant inheritance.

1. achondroplasia
2. polydactyly
3. cri-du-chat syndrome
4. Huntington's disease

Bonus Answer: 1, 2, 4

Bonus: Short Answer

Name all of the following genetic disorders that result from chromosomal abnormalities.

1. Down syndrome
2. color blindness
3. cri-du-chat
4. Klinefelter's Syndrome

Bonus Answer: 1, 3, 4

==========

374. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

You come across a yellow pea colored garden pea plant, and you want to determine its genotype. You testcross it with a green pea colored pea plant, which yields 501 yellow plants and 495 green plants. What is the genotype of the yellow parent?

Bonus Answer: ACCEPT any of the following: heterozygous, hybrid

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Bonus: Short Answer

You are cross breeding two garden pea plants. The first parent's genotype is heterozygous yellow for its pea color, homozygous purple for its flower color, and is heterozygous for its tall trait. The second parent's genotype is homozygous green for its pea color, heterozygous purple for its flower color, and heterozygous for its tall trait. What fraction of their offspring will be green pea colored, purple flower colored, and short?

Bonus Answer: 1/8

==========

375. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following statements is incorrect?

W) RNA polymerase adds nucleotides in the 5' to 3' direction.

X) There are three main RNA polymerases in eukaryotes.

Y) DNA transcription requires a helicase to unwind the DNA.

Z) Transcription adds about 40 nucleotides per second to the growing mRNA transcript in eukaryotes.

Toss Up Answer: Y

Bonus: Short Answer

Spliceosomes contain the greatest amount of which type of RNA?

Bonus Answer: snRNA (ACCEPT: small nuclear RNA, small nuclear ribonucleic acid) (DO NOT ACCEPT: snRNP)

==========

376. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

A eukaryotic cell has synthesized a primary mRNA transcript. Which of the following DOES NOT happen to it before it leaves the nucleus?

W) a guanosine cap is added to the 5' end

X) a polyadenylation signal is added to the 3' end as an untranslated region

Y) a poly-A tail is added to the 3' end

Z) introns are excised

Toss Up Answer: X

Bonus: Short Answer

The modified mRNA codes for insulin protein to be secreted by the cell. During translation, which molecule is responsible for bringing the the ribosome, mRNA, and forming polypeptide to the ER membrane?

Bonus Answer: signal recognition particle (ACCEPT: SRP)

==========

377. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

A mutation in the ras gene

W) immediately leads to cancer

X) causes the cell to undergo apoptosis
Y) leads to excessive cell division
Z) DNA breakage
Toss Up Answer: Y

Bonus: Short Answer
Ras functions as a G protein associated with what type of receptor?
Bonus Answer: tyrosine kinase (ACCEPT: receptor tyrosine kinase)

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378. BIOLOGY

Writer: Calvin Vuong
Toss Up: Short Answer
What molecules prevent DNA strands from rezipping after helicase uzips the strands during DNA replication?
Bonus Answer: single stranded binding proteins

Bonus: Short Answer
DNA ligase joins what in the lagging strand of DNA during DNA replication?
Bonus Answer: Okazaki fragments

==========

379. BIOLOGY

Writer: Calvin Vuong
Toss Up: Multiple Choice
All white blood cells originate in which part of the body?
W) thymus
X) lymphatic system
Y) bone marrow
Z) spleen
Toss Up Answer: Y

Bonus: Short Answer
Name all of the following choices that are derived from a common myeloid progenitor. (1) eosinophil, (2) natural killer cell, (3) cytotoxic T cell, (4) megakaryoctye
Bonus Answer: 1, 2, 4

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380. BIOLOGY

Writer: Calvin Vuong
Toss Up: Multiple Choice
Which of the following is NOT a granulocyte?
W) eosinophil
X) dendritic cell
Y) neutrophil
Z) basophil
Toss Up Answer: X

Bonus: Short Answer
What is another name for granulocytes, based on their oddly shaped nuclei?
Bonus Answer: polymorphonuclear leukocytes

==========

381. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Which class of MHC molecules do helper TH2 cells interact with?

Bonus Answer: II (ACCEPT: class II)

Bonus: Short Answer

Name all of the following that correctly distinguish between B cell antibodies and T cell receptors.

1) Antibodies can bind to free antigens while T cell receptors can only bind to antigens displayed on MHC molecules.

2) T cell receptors contain two antigen binding sites while antibodies contain only one.

3) T cell receptors generally only bind to fragments of antigens while antibodies bind to whole antigen molecules.

4) Both antibodies and T cell receptors have discrete alpha and beta components.

Bonus Answer: 1, 3

==========

382. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

In order to begin the activation of the adaptive immune system, chemokines frequently attract mature dendritic cells to which bodily area?

W) thymus

X) lymph nodes

Y) the site of infection

Z) kidney

Toss Up Answer: X

Bonus: Multiple Choice

Which structures in the gut-associated lymphoid tissues, or GALT, function most similarly to lymph nodes in the activation of the adaptive immune response?

W) periarteriolar lymphoid sheaths

X) spleen

Y) Paneth cells

Z) Peyer's patches

Bonus Answer: Z

==========

383. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

Which of the following antibody functions is the most effective against viruses and bacterial exotoxins?

W) opsonization

X) neutralization

Y) complement activation

Z) cell mediated immunity

Toss Up Answer: X

Bonus: Multiple Choice

What is the main function of the complement system in innate immunity?

W) destroy pathogens by lysing their cell walls

X) mark cells for destruction by cytotoxic T cells

Y) coat the pathogen surface to better enable phagocytes to engulf and destroy the bacteria

Z) recruit neutrophils and other granulocytes

Bonus Answer: Y

==========

384. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Which immune cell, derived from a common lymphoid progenitor and matured in the thymus, functions in the cell mediated adaptive immune response?

Bonus Answer: T cell

Bonus: Short Answer

T cells contain either CD8 or CD4 coreceptors. CD8 preferentially binds with class I MHC molecules while CD4 preferentially binds with class II MHC molecules. Which coreceptor is present in cytotoxic T cells, and which coreceptor is present in helper T cells?

Bonus Answer: Cytotoxic T cell: CD8

Helper T cell: CD4

==========

385. BIOLOGY

Writer: Calvin Vuong

Toss Up: Short Answer

Select all of the following ways in which the mucosal epithelia protect the body against disease.

1) act as a barrier

2) trap pathogens

3) secrete antimicrobial peptides

Bonus Answer: 1, 2, 3

Bonus: Multiple Choice

Which of the following is not involved in the innate immune defense of the intestinal tract?

W) beta-defensins

X) alpha-defensins

Y) commensal bacteria

Z) cryptidins

Bonus Answer: W

==========

386. BIOLOGY

Writer: Calvin Vuong

Toss Up: Multiple Choice

How do macrophages recognize the pathogens that they engulf?

W) using broad range pathogen-associated molecular patterns

X) by discerning between self MHC molecules and pathogen MHC molecules

Y) by using receptors that are specific to a particular pathogen

Z) macrophages ingest cells randomly

Toss Up Answer: W

Bonus: Short Answer

Choose all of the following that are ways macrophages destroy the pathogens that they engulf.

1) Phagosomes fuse with lysosomes, killing the pathogen inside.

2) Oxide ion is produced by NADPH oxidase and is toxic to bacteria.

3) Hydrogen peroxide is produced by superoxide dismutase and is toxic to bacteria.

4) Hydroxyl radicals, hypochlorite, and hypobromite are produced by peroxidases and are toxic to bacteria.

Bonus Answer: 1, 3, 4

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