**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the hormone that is regulated by the ob and db genes? It suppresses appetite and is produced by adipose cells.

ANSWER: LEPTIN

**BONUS**

BIOLOGY *Multiple Choice*- Which of the following is correct about the small intestine stage in digestion?

W) Cholecystokinin stimulates the pancreas to release sodium bicarbonate

X) Gastrin is created by the small intestine and stimulates the production of gastric juices in the stomach

Y) Sugars enter the bloodstream by being coated with phospholipids to create chylomicrons, which are transported into the hepatic portal vein

Z) The pancreas creates amylases, trypsin, chymotrypsin, carboxypeptidase, nucleases, and lipase to digest macromolecules

ANSWER: Z

**TOSS-UP**

1. BIOLOGY *Short Answer*- In the citric acid cycle, what is the name of the molecule which is transformed into citrate through the addition of acetyl CoA

ANSWER: OXALOACETATE

**BONUS**

BIOLOGY *Short Answer-* Denote all of the following three statements that are NOT true about the electron transport chain.

1: Cytochrome reductase comes before cytochrome oxidase and ubiquinone

2: NADH supplies its electrons to the multiprotein complex called succinate dehydrogenase

3: Oxygen is used to capture the electrons after they leave the final multiprotein complex

ANSWER: 2

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- Which of the following plant parts are correctly matched to what portion of the plant is modified?

W) Tubers- roots

X) Tendrils- stems

Y) Pneumatophores- roots

Z) Stolons- leaves

ANSWER: Y

**BONUS**

BIOLOGY *Short Answer*- Denote all of the following three statements that are true about differentiated plant cells

1: Parenchyma cells have the capability to differentiate into collenchyma and sclerenchyma cells, and a whole plant can be grown from a single parenchyma cell

2: Collenchyma cells are found right underneath the epidermis of young stems and have lignin in their walls, which gives them flexibility

3: Sclerenchyma cells are long, thin cells with tapered ends that transport water and sugar around the cell

ANSWER: 1

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- When a gel electrophoresis is done, what will the DNA molecules do?

W) Move towards the anode

X) Move towards the cathode

Y) Move towards the center

Z) Spread randomly across the gel

ANSWER: W

**BONUS**

1. BIOLOGY *Multiple Choice*- Which of the following explains how the dideoxyribonucleotides terminate a DNA strand?

W) It systematically replaces all the deoxyribonucleotides which stops synthesis

X) It has no 3'- OH groups, so the next nucleotide cannot attach

Y) It has no 5’- OH groups, so the next nucleotide cannot attach

Z) Dideoxyribonucleotides are attracted to their respective deoxyribonucleotides and cleave the base at specific bonds

ANSWER: X

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the type of conditioning that occurs when a wolf learns not to eat porcupines after being stabbed with needles?

ANSWER: OPERANT

**BONUS**

BIOLOGY *Short Answer-*Denote all of the following four statements that is an example of habituation?

1: Mammals will ignore alarm calls done by members of their own species if there follows no actual attack

2: Chimpanzees will stack boxes in order to reach a banana hanging from the ceiling

3: A goose that has an egg roll out of its nest will automatically push it back in

4: A sea anemone, after failing to eat a stick, will eventually ignore it

ANSWER: 1 AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer*- What phylum contains the classes Hydrozoa, Scyphozoa, Cubozoa, and Anthozoa?

ANSWER: CNIDARIANS

**BONUS**

BIOLOGY *Multiple Choice*­- Which of the following is an example of a cubozoa?

W) Sea nettles

X) Sea wasps

Y) Cube anemones

Z) Coral

ANSWER: X

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- If a fish is swimming upside down and a scientist is holding a magnet above it, which of the following is happening?

W) The fish has swallowed metal shavings, so its body is attracted to the magnet

X) Materials in the fish’s body is repelled by the magnet

Y) Materials in the fish’s body attract the magnet

Z) The statoliths in the fish’s statocysts were replaced by metal

ANSWER: Z

**BONUS**

BIOLOGY *Short Answer*- Denote all of the following three statements that are true about utricles and saccules.

1: The hairs on the hair cells project into a gel called the cupula.

2: If a car moves forward, the saccule will report the motion instead of the utricle

3: The tectorial nerve receives the signals from the utricle and the saccule

ANSWER: 1

**TOSS-UP**

1. BIOLOGY *Short Answer*- Severe acute respiratory syndrome (SARS) is in what class of viruses?

ANSWE: CORONAVIRUS

**BONUS**

BIOLOGY *Short Answer*- Match the following three viruses with their type of nucleic acid.

Adenovirus, Coronavirus, Reovirus

Single-stranded RNA, Double-stranded DNA, Double-stranded RNA

ANSWER: 2, 1, 3 (DOUBLE-STRANDED DNA, SINGLE-STRANDED RNA, DOUBLE-STRANDED RNA)

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- Which of the following algae types is the cause of watermelon snow, a phenomenon where carotenoid pigments turn the snow red

W) Red algae

X) Brown algae

Y) Green algae

Z) Golden algae

ANSWER: Y

**BONUS**

BIOLOGY *Short Answer*- Whereas most amoebozoans are free-living, what is the name of the genus that that are parasitic?

ANSWER: ENTAMOEBA

**TOSS-UP**

1. BIOLOGY *Short Answer*- What are the names of the two secondary messengers that are derived from PIP2?

ANSWER: INOSITOL TRIPHOSPHATE AND DIACYLGLYCEROL (IP3 AND DAG)

**BONUS**

BIOLOGY *Short Answer*- What is the name of the drug that inhibits the hydrolysis of cGMP to GMP? cGMP increase blood flow by relaxing smooth muscle cells in artery walls.

ANSWER: VIAGRA

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- Which of the following best describes the Tay-Sachs disease?

W) Incomplete Dominance

X) Dominant

Y) Recessive

Z) Epistasis

ANSWER: W

**BONUS**

BIOLOGY *Short Answer-* Denote by name or number all of the following four factors determines the color of the hydrangea flower?

1: Aluminum content

2: Humidity

3: pH of soil

4: Temperature

ANSWER: 1 AND 3

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- Which of the following is NOT a connective tissue?

W) Fat tissue

X) Blood

Y) Cartilage

Z) Glia

ANSWER: Z

**BONUS**

BIOLOGY *Short Answer*- What is the name of the cells that produce cartilage?

ANSWER: CHONDROCYTES

**TOSS-UP**

1. BIOLOGY *Short Answer*- When blood squirts backward through a defective valve in the heart, what is the name of the abnormal sound that it produces?

ANSWER: HEART MURMUR

**BONUS**

BIOLOGY *Short Answer*- Heart contraction is run by electrical impulses. List the following four portions of the heart in the order that they receive these signals.

Heart Apex, Atrioventricular Node, Purkinje Fibers, Sinoatrial Node

ANSWER: 4, 2, 1, 3 (SINOATRIAL NODE, ATRIOVENTRICULAR NODE, HEART APEX, PURKINJE FIBERS)

**TOSS-UP**

1. BIOLOGY *Multiple Choice­*- Which of the following is NOT how antibodies remove antigens?

W) Antigens bind onto the virus and prevent it from binding to a host cell

X) Antigens bind to the foreign cell and create membrane attack complexes, which causes the cell to lyse

Y) Natural killer cells follow behind antibodies and consume any cell tagged by antibodies

Z) Antibodies provide a easily-recognizable structure for macrophages, increasing phagocytosis

ANSWER: Z

**BONUS**

BIOLOGY *Short Answer*- What is the name of the process where antibodies present a readily-recognized structures for macrophages, increasing phagocytosis?

ANSWER: OPSONIZATION

**TOSS-UP**

1. BIOLOGY *Short Answer*- Denote all of the following three statements that are true about hormones?

1: Oxytocin is produced by the anterior pituitary gland

2: Insulin is produced by islets of Langerhans

3: Parathyroid lowers blood calcium level, whereas calcitonin raises it

ANSWER: 2

**BONUS**

BIOLOGY *Multiple Choice*- Which of the following hormones causes the transformation from larva to pupa to adult in insects?

W) Ecdysone

X) Juvenile Hormone

Y) Thoracicotropic Hormone

Z) Triiodothyronine

ANSWER: W

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the name of the cells that surround the stomata of plants?

ANSWER: GUARD (CELLS)

**BONUS**

BIOLOGY *Multiple Choice*- Which of the following statements concerning the stomata is true?

W) The cellulose microfibrils are oriented so that they span the longer side of the cell and are tangent to the stomata

X) When H+ is pumped out of the cells, K+ is taken in, causing them to become turgid

Y) When the guard cell is turgid, the stomata closes, since the cells than take up more space

Z) The two guard cells that form the stomata do not touch at all

ANSWER: X

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the name of the barrier in a plant that prevents minerals and waters from entering the xylem through the apoplastic route? It forces minerals to travel through the plasma membrane of at least one cell.

ANSWER: CASPARIAN STRIP

**BONUS**

BIOLOGY *Multiple Choice*- Which of the following is correct?

W) Gottation is the process where water is exuded from leaf edges

X) The flow of water and minerals cannot switch between the apoplastic route and the symplastic route

Y) The Casparian strip is found in the stele

Z) The symplastic route goes through the plasmodesmata of neighboring cells

ANSWER: Z

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the name of the plant hormone that contains the hormone indoleacetic acid, or IAA? This class of hormones promotes adventitious and lateral roots, apical dominance, and elongates cells.

ANSWER: AUXINS

**BONUS**

BIOLOGY *Multiple Choice*- Which of the following is the correct name for the model that describes how auxins affect cell elongation?

W) Cell expansion model

X) Proton pump model

Y) Acid growth model

Z) Polysaccharide cleavage model

ANSWER: Y

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the name for the extraembryonic membrane that encloses the yolk in an embryo?

ANSWER: YOLK SAC

**BONUS**

BIOLOGY *Short Answer*- Denote all of the following three statements that are correct about the extraembryonic membranes.

1: The allantois completely surrounds all of the extraembryonic membranes

2: The amnion stores nutrients in a material called the albumen

3: The chorion exchanges gases between the embryo and the air

ANSWER: 3

**TOSS-UP**

1. BIOLOGY *Short Answer*- What is the name of the disorder where the hands and feet of a person grow to abnormal lengths?

ANSWER: ACROMEGALY

**BONUS**

BIOLOGY *Short Answer-* What is the name for the class of amine hormones that are synthesized from the amino acid tyrosine?

ANSWER: CATECHOLAMINES

**TOSS-UP**

1. BIOLOGY *Multiple Choice*- Which of the following is the correct order for a butterfly?

W) Hemiptera

X) Lepidoptera

Y) Dermaptera

Z) Isoptera

ANSWER: X

**BONUS**

BIOLOGY *Short Answer*- Arthropods consist of four lineages. What is the name of the subphylum that includes spiders, scorpions, horseshoe crabs, and ticks?

ANSWER: CHELICERIFORMES

**TOSS-UP**

1. BIOLOGY *Short Answer*- Concerning fungi, what is the name of the crossing walls that divide the hyphae into individual cells?

ANSWER: SEPTA

**BONUS**

BIOLOGY *Short Answer*- What is the name of the phylum of fungi that forms arbuscular mycorrhizal fungi? They were originally thought to by zygomycetes.

ANSWER: GLOMEROMYCETES