**TOSS-UP**

1. BIOLOGY *Short Answer* What is the genus of the protist that evades immune responses through a “bait-and-switch” techniques, where it switches the protein on its cellular membrane to prevent the immune responses from locking on to it?

ANSWER: TRYPANOSOMA

**BONUS**

BIOLOGY *Short Answer* Which of the following four statements is NOT true about protists?

1: Protists in diplomonads and parabasalids have modified mitochondria called mitosomes

2: Euglenids have cells that are reinforced by cellulose plates

3: Stramenopiles include diatoms, golden, and brown algae

4: Stramenopiles store energy in the form of a glucose polymer tantinarin

ANSWER: 2 AND 4

**TOSS-UP**

1. BIOLOGY *Multiple Choice* Which of the following best describes how cnidarians incapacitate their prey?

W) A tentacle releases an electric shock when it senses contact through mechanoreception

X) A tentacle has individual barbs that injects poison when it sense other organisms through chemical systems

Y) Barbed teeth on the mouth of the hydra grab onto the prey and inject poison

Z) A cnidocyte injects a thread that punctures the skin and injects poison

ANSWER: Z

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that are differences between deuterostomes and protostomes

1: Deuterostomes’ eight-cell stage is spiral and determinate

2: A protostome’s coeloms are located near the blastopore

3: Deuterostomes’ mesoderm completely encircles the coelom

4: In protostomes, the anus develops from the blastopore

ANSWER: 1, 3, AND 4

**TOSS-UP**

1. BIOLOGY *Multiple Choice* Which of the following is an example of using a reaction formation to deny something? In this case, what is being denied is the fact that their arm is paralyzed.

W) A man flatly says, “My arm is perfectly fine. It’s not paralyzed”

X) A woman asserts that her paralyzed arm is stronger than her good arm in order to chase away the idea that her arm could be paralyzed

Y) A man uses the excuse “I’m steadying myself with that arm so I can raise my other arm” when asked to raise both arms

Z) A woman sees her arm and says, “This paralyzed arm belongs to my brother, for I know perfectly well my arm is fine”

ANSWER: X

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four syndromes that are NOT paired correctly with one of their symptoms

1: Fregoli- A person sees his mother’s face in everybody’s face he meets

2: Cotard- A person, when asked what his condition is like, asserts that he is dead and that he can feel the maggots and smell the rotting flesh

3: Pseudocyesis- A man develops signs of pregnancy including abdominal swelling, milk production, and labor pains

4: Capgras- A person cannot retain any memories from the past, and thus asserts that his parents and friends are in fact imposters

ANSWER: 3 AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the term for a person with an abnormally low IQ, normally under 50, who displays immense knowledge and brain capacity? One such example in real life is a person who does not even know how to add one-digit numbers yet can come up with a nine-digit prime number in one or two seconds.

ANSWER: SAVANT

**BONUS**

BIOLOGY *Short Answer* What is the name of an abnormally large blind spot in people with brain damage?

ANSWER: SCOTOMA

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the name of the syndrome that is caused when there is excessive growth hormone AFTER growth has already stopped?

ANSWER: ACROMEGALY

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that are true about oxytocin

1: It stimulates mammary glands and uses negative feedback

2: It is responsible for the fact that a woman who had just given birth does not develop a life-threatening hemorrhage

3: Excess oxytocin can downplay a baby’s oxytocin receptors and cause autism

4: Oxytocin increases bonding between a mother and her husband

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the name of the hormone produced by fat cells that tells the hypothalamus how much fat one has in store

ANSWER: LEPTIN

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that is NOT true

1: Ghrelin levels fall when one has just ingested a meal

2: Ghrelin responds more to some foods than another

3: PYY is highest before a meal

4: An excess of leptin occurs in ob/ob humans

ANSWER: 3 AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer* Which hormone, produced in pulsed doses every ninety minutes or so, travels to the anterior pituitary where it stimulates production of LH and FSH?

ANSWER: GONADOTROPIN RELEASING HORMONE (GnRH)

**BONUS**

BIOLOGY *Multiple Choice* Which of the following is the name for a condition where a woman’s periods are lost due to decreasing levels of body fat?

W) Stein-Leventhal syndrome

X) Amenorrhoea

Y) Cretinism

Z) Polycystic ovary syndrome (PCOS)

ANSWER: X

**TOSS-UP**

1. BIOLOGY *Short Answer* Which disease causes hyperglycaemia? It causes glucose to accumulate in the blood and gives urine a malty smell

ANSWER: DIABETES

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that is true about diabetes

1: Type 2 diabetes occurs when insulin-producing islets of Langerhan in the pancreas are destroyed

2: Type 1 diabetes is an autoimmune disease

3: Insulin injections can fix type 2 diabetes

4: Type 2 diabetes occurs in physically unactive people because fat is taken from the muscles, instead of from the bloodstream

**TOSS-UP**

1. BIOLOGY *Multiple Choice* Which of the following is the best explanation for why the first contraceptive pills worked?

W) The oxytocin in the pills actively competed with FSH for the follicles which causes ovulation

X) The pills temporarily destroys follicles in the womb

Y) The anterior pituitary is temporarily shut down as the LH levels increase

Z) The oxytocin in the pills tells the anterior pituitary that the FSH is not needed

ANSWER: Z

**BONUS**

BIOLOGY *Short Answer* Russell Marker, who created the octane rating system, came up with the first commercially efficient method to make progesterone and testosterone from saponin. What root vegetable did he extract this from?

ANSWER: YAM

**TOSS-UP**

1. BIOLOGY *Multiple Choice* Who published ideas on descent on modification at around the same time Darwin did, yet received no credit?

W) Wallace

X) Lyell

Y) Arevalo

Z) Ulrich

ANSWER: W

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that will NOT meet the concept of Hardy-Weinberg equilibrium if it occurs

1: Gene flow

2: No mutations

3: No natural selection

4: Preferred mating

ANSWER: 1 AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer* Denote all of the following four that are true about fungi

1: Chytrids have about the same number of species as glomeromycetes

2: A fairy ring is an example of ascomycetes

3: About half of all plants have mutualistic partnerships with glomeromycetes

4: Some chytrids live in the digestive tracts of ruminants and break down plant matter

ANSWER: 4

BIOLOGY *Short Answer* What is the name of the type of fungus which contains the genus *Rhizopus?*

ANSWER: ZYGOMYCETES

**TOSS-UP**

1. BIOLOGY *Short Answer* Which vitamin is a component of coenzyme A? A deficiency of this can by fatigue and numbness

ANSWER: PANTHOTHENIC ACID (B5)

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four that is NOT true about vitamins

1: Thiamine or vitamin B1 is a coenzyme used in removing CO2 from organic compounds

2: Phylloquinone is another name for vitamin E

3: An excess of pyridoxine can cause an unstable gait and poor coordination

4: Vitamin B12 is a coenzyme in the synthesis of fats and glycogen

ANSWER: 2 AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer* What biome is mostly herbaceous, consisting of mosses, grasses, and forbs, along with dwarf shrubs and lichens? Animals that live here include bears and musk oxen

ANSWER: TUNDRA

**BONUS**

BIOLOGY*Short Answer* Denote all of the following that is true about biomes

1: Tropical forests and temperate broadleaf forests have epiphytes

2: Insects are the dominant herbivores in savannas

3: Temperate grasslands are the focus of mineral and oil extraction

4: In the chaparral, plants tend to have adaptations in case of a drought or fire

ANSWER: 1, 2, AND 4

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the name of the effect that occurs in populations where each individual added to a population has a positive effect on the population’s growth rate?

ANSWER: ALLEE EFFECT

**BONUS**

BIOLOGY *Multiple Choice* Which of these is not an example of the Allee effect?

W) A patch of flowers has more resistance to wind, which allows them to easily live to reproduction

X) A rare animal gains value as its population falls, which leads to more hunting and even more value

Y) As geese population goes up so does hunting

Z) Wild dogs have trouble finding mates as numbers dwindle

ANSWER: Y

**TOSS-UP**

1. BIOLOGY *Short Answer* Which biochemist developed a technique that was first used to detect the β-globin gene, using a combination of gel electrophoresis and nucleic acid hybridization?

ANSWER: SOUTHERN

ANSWER: 1, 2, AND 4

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four diseases that are caused by prions?

1: Kuru

2: Mad cow disease

3: Hemorrhagic fever

4: Scrapie

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the name of the gel-forming substance that is found in the cell walls of brown algae and is used to thicken processed foods like ice cream?

ANSWER: ALGIN

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that are NOT true about protists?

1: Radiolarians have sturdy symmetrical exoskeletons made of silica

2: Plasmodium, the parasite that causes malaria, constantly change their surface proteins like trypanosomes

3: Hydrogenosomes are found in diplomonads and produce energy anaerobically

4: Brown algae contains the most complex multicellular anatomy of all algae

ANSWER: 1 AND 3

**TOSS-UP**

1. BIOLOGY *Short Answer* Denote all of the following four statements that correctly pairs each spice to the region of the plant it is derived from

1: Cumin- Flowers

2: Cinnamon- Fruits and seeds

3: Saffron- Flowers

4: Vanilla- Fruits and seeds

ANSWER: 3 AND 4

**BONUS**

BIOLOGY *Multiple Choice* Which of the following compound is derived from the foxglove plant and used in heart medication?

W) Digitalin

X) Atropine

Y) Quinine

Z) Vinblastine

**TOSS-UP**

1. BIOLOGY *Short Answer* What is the name of organs in insects and terrestrial arthropods that remove nitrogenous wastes?

ANSWER: MALPIGHIAN TUBULES

**BONUS**

BIOLOGY *Short Answer* Denote all of the following four statements that are NOT true about regulation

1: Annelida contain protonephridia, which are excretory organs that open internally into the coelom

2: Malpighian tubules are different from other excretory systems because there is no filtration step

3: The human kidney receives about 50% of the blood exiting the heart

4: Most of the nephrons in the human kidney are cortical nephrons, which are mainly confined to the renal cortex and medulla

ANSWER: 1, 3, AND 4