**TOSS-UP**

CHEMISTRY *Short Answer* What type of reaction is occurring in CH3CH2CH2Br yields CH3CHCH2Br?

ANSWER: ELIMINATION

**TOSS-UP**

PHYSICS *Short Answer* In specular reflection, which statement correctly relates the angle of reflection and the angle of incidence?

W) the angle of incidence is greater than the angle of reflection

X) the angle of reflection is greater than the angle of incidence

Y) the angle of reflection is equal to the angle of incidence

Z) there is no correlation between the angles

ANSWER: Y) the angle of reflection is equal to the angle of incidence

**TOSS-UP**

BIOLOGY *Short Answer* This hormone, found primarily in the embryo of seeds and meristems of apical buds stimulates stem elongation, regulates the development of fruit, and has a major role in the plant’s photropism.

ANSWER: IAA

**TOSS-UP**

ENERGY *Multiple Choice* Which of the following is not a net product in the Citric Acid cycle?

W) 4 ATP

X) 2 NADH

Y) 2 Hydrogen ions

Z) 2 pyruvates

ANSWER: W) 4 ATP

**TOSS-UP**

EARTH AND SPACE SCIENCE *Short Answer* The region of the ocean primarily composed of sand and sediments and who’s primary food source comes from organic detritus is called what?

ANSWER: Benthic Zone

**TOSS-UP**

CHEMISTRY *Multiple Choice* Which of the following does not describe a second order reaction?

W) the half-life of the reaction is inversely proportional to the initial concentration of the reactant

X) the units to describe this reaction would be L/mols×seconds

Y) the half-life of the reaction would increase as the reaction progressed

Z) the rate law would equal the rate constant times the initial concentration

ANSWER: Z) the rate law would equal the rate constant times the initial concentration

**TOSS-UP**

PHYSICS *Multiple Choice* Which of the following has the greatest impact on the speed of sound through a medium?

W) the density of the medium

X) the compressibility of the medium

Y) the temperature of the medium

Z) the pressure that the medium is under

ANSWER: X) the compressibility of the medium

**TOSS-UP**

BIOLOGY *Short Answer* The term for the rapid stimulated response to a foreign touch by plants is called what?

ANSWER: Thigmotropism

**TOSS-UP**

ENERGY *Multiple Choice* Which of the following is the type of coal that burns with the greatest energy released?

W) Graphite

X) Lignite

Y) Bituminous Coal

Z) Anthracite

ANSWER: Z) Anthracite

**TOSS-UP**

EARTH AND SPACE SCIENCE *Short Answer* This biome primarily occurs in midlatitude coastal regions. Its distinctive traits are seasonal rains, and an abundance of shrubs and other plants that are resistant to drought and occasional fires that sweep the landscape.

ANSWER: Chapparal

**TOSS-UP**

CHEMISTRY *Short Answer* Rank the sizes of the ions of the following elements from smallest to largest.

Phosphorus, sodium, aluminum.

ANSWER: ALUMINUM, SODIUM, PHOSPHORUS

**TOSS-UP**

PHYSICS *Short Answer* Which law states that it is impossible to reach absolute zero in a finite number of steps, and that the entropy of a system is a constant at absolute zero?

ANSWER: Third Law of Thermodynamics (Nernst Theorem)

**TOSS-UP**

BIOLOGY *Short Answer* These two hormones control blood glucose levels, and work to maintain homeostasis.

ANSWER: Glucagon, Insulin

**TOSS-UP**

ENERGY *Multiple Choice* Which of the following is used in lactic acid fermentation that is not a product of the citric acid cycle?

W) NADH

X) ATP

Y) NAD+

Z) Pyruvate

ANSWER: NAD+

**TOSS-UP**

EARTH AND SPACE SCIENCE *Short Answer* This moon is the largest in the solar system, and is distinctive due to the fact that it has its own internally generated magnetic field.

ANSWER: Ganymede

**TOSS-UP**

CHEMISTRY *Multiple Choice* The tetrahedral hybridization structure would contain which of the following?

W) three sp3hybridized orbitals, one un-hybridized p orbital

X) four sp3 hybridized orbitals

Y) two sp3 hybridized orbitals, two un-hybridized p orbitals

Z) four sp3d orbitals

ANSWER: X) four sp3 hybridized orbitals

**TOSS-UP**

PHYSICS *Short Answer* A pipe open at both ends has an effective air column of 11 meters. Given that sound travels at 343 meters per second, find the fundamental frequency of the pipe to two significant digits.

ANSWER: 31 (Hertz)

**TOSS-UP**

BIOLOGY *Short Answer* This gland is where lymphocytes formed in the bone marrow develop into T-Cells.

ANSWER: Thymus

**TOSS-UP**

ENERGY *Short Answer* These organisms survive by taking the energy they use from compounds produced by other creatures.

ANSWER: Heterotrophs

**TOSS-UP**

CHEMISTRY *Short Answer* What is the name for the process in which phosphorus atoms are introduced into the lattice structure of silicon?

ANSWER: n-type doping

**TOSS-UP**

PHYSICS *Short Answer* A car is moving at 60 kilometers per hour along a flat surface. What is the difference in speed between the top and bottom of the tires at the same instant in kilometers per hour?

ANSWER: 120 kilometers per hour

**TOSS-UP**

BIOLOGY *Short Answer* This part of the human brain is located near the center, and is primarily responsible for regulating speech.

ANSWER: Broca’s Area

**TOSS-UP**

ENERGY *Multiple Choice* According the Schrodinger model of a particle in a box, by how many times more energetic would a particle with mass 4M at the second energy level be than a particle with mass M at the first energy level, assuming that the length of the box is kept constant?

W) same

X) 2 times greater

Y) 3 times greater

Z) 2 times smaller

ANSWER: W) Same

**TOSS-UP**

EARTH AND SPACE SCIENCE *Short Answer* Which type of lava flows the fastest?

W) iron rich lava

X) iron poor lava

Y) magnesium rich lava

Z) magnesium poor lava

ANSWER: Y) magnesium rich lava