1. Toss-Up; Chemistry Short Answer

What is the name given for a species that exists during a reaction but does not appear in the chemical equation?

Answer: Intermediate

1. Toss-Up; Biology Multiple Choice

Choose the correct statements of the following 4 concerning the functions of vacuoles

1. Used in the disposal of metabolic by-products

2. Provides anchorage for motor proteins

3. Maintains the Turgor pressure of a Plant cell

4. Allows for a larger plasma membrane surface area to cytosolic volume ratio in plant cells

Answer: 1, 3, 4

1. Toss-Up; Earth and Space science Short answer

What is the name of the German Meterologist who first proposed the theory of Continental Drift?

Answer: Alfred Wegener

1. Toss-Up; Energy

Which of the following is NOT part of a Bomb Calorimeter:

w. Stirrer

x. Firing Leads

y. Piston

z. Thermometer

Answer: y. Piston

1. Toss-Up; Physics Multiple Choice

Which of the following probability distributions can be used to model the behavior of electrons in a lattice structure?

w. Bose-Enstein function

x. Gaussian distribution function

y. Maxwell-Boltzmann function

z. Fermi-Dirac function

Answer: z. Fermi-Dirac function

1. Toss-Up; Math Short Answer

What is the perimeter of a right triangle with leg lengths of 3 and 4?

Answer: 12

1. Toss-Up; Chemistry Multiple Choice

Trouton’s rule is used to predict the entropy of vaporization of any liquid but is NOT accurate for liquids with which of the following properties

w. molecules composed of more than 3 atoms

y. molecules composed of less than 6 atoms

z. molecules with considerable differences in atomic radii

y. molecules with large differences in electronegativity among atoms

Answer Y. molecules with large differences in electronegativity among atoms

1. Toss-Up; Biology Multiple Choice

In a mitochondrion, where would would one expect to find considerable amounts of ATP synthase?

w. The crista space

x. Inter membrane space

y. Within the matrix

z. Attached to the outer membrane

Answer: y. within the matrix

1. Toss-up; Earth and Space Science Short answer

What class of minerals are silicates which have highly perfect basal cleavage and sheet-like hexagonal arrangement of atoms?

Answer: Micas

1. Toss-Up; Energy Short Answer

What is the name given to the specific mass of fissile material needed to sustain a nuclear chain reaction?

Answer: Critical Mass

1. Toss-Up; Physics Short answer

What is the name of the physicist who first published a solution to the “Ultraviolet Catastrophe” in 1900?

Answer: Maxwell Planck

1. Toss-Up; Math multiple choice

When the sum of a list of prices is divided by the average (arithmetic mean) of the prices, the result is *k*. What does *k* represent?

w. The sum of the prices

x. Half of the sum of the prices

y. The average of the prices

z. The number of prices

Answer: z. The number of prices

1. Toss-Up; Chemistry Short Answer

What is the name of a reaction in which the mechanism continuously produces highly reactive intermediates? What is the name given to these intermediates?

Answer: Chain Reaction; Chain Carriers

1. Toss-Up; Biology Multiple Choice

Which of the following is not an organism that uses Phagocytosis?

w. Monocytes

x. MacroPhage

y. Osteoclasts

z. NK cells

Answer: z. NK cells

1. Toss-Up; Earth and Space Science Short Answer

In support of Wegener’s theory, the Appalachian mountains and what northern European mountain range appear discontinuous in modern geography but form one complete mountain belt when applied to Pangea

Answer: Caledonian Mountains

1. Toss-Up; Energy Multiple Choice

Which of the Following systems is Isolated:

w. a polystyrene cup containing hot coffee

x. a bomb calorimeter used for combustion of Benzene

y. a manometer filled with helium gas

z. a plastic water bottle

Answer: x. a bomb calorimeter used for combustion of benzene

1. Toss-Up; Physics Short Answer

What quantum mechanical principle do electrons in a lattice structure obey that makes the Fermi-Dirac function suitable for simulating them, but NOT the Maxwell-Boltzmann function?

ANSWER: The Pauli Exclusion Principle

1. Toss-Up; Math Short Answer

If x2-y2=77 and x + y=11, what is the value of x?

Answer: 9

1. Toss-Up; Chemistry short answer

The values of G ΔS and ΔH for a reaction are Negative, Positive and negative respectively, what relative temperature will the reaction be spontaneous

Answer: All Temperatures

1. Toss-Up; Biology Short Answer

At the end of Glycolysis what molecule will ultimately be formed

Answer: Glyceraldehyde-3-Phosphate

1. Toss-Up; Earth and Space Science Short answer

Micas have basal cleavage, what are three of the five other types of cleavage that can occur in minerals?

Answer: Any three of:Cubic, Octahedral, Dodecahedral, Rhombohedral, Prismatic cleavage

1. Toss-Up; Energy Short answer

Name three properties that Critical mass could depend upon

Answer: Any three of: density, shape, enrichment, purity, temperature and surrounding

1. Toss-Up; Physics Short Answer

Maxwell Planck is well-known for his work on the photoelectric effect. Who eventually won Nobel Prize for his work in the photoelectric effect?

Answer: Albert Einstein

1. Toss-Up; Math Multiple Choice

The number that results when an integer is multiplied by itself CANNOT end in which of the following digits?

w. 4

x. 5

y. 6

z. 8

Answer: z. 8

1. Toss-Up; Chemistry Short Answer

What is the name given to the pair of species involved in a Redox reaction?

Answer: Redox Couple