**TOSS UP**

1. BIOLOGY *Multiple Choice* Which of the following describes the major difference between bryophytes and tracheophytes?   
   w) tracheophytes can survive on land

x) tracheophytes have seeds inside fruits

y) tracheophytes can make their own food

z) tracheophytes have vessels to transport materials

ANSWER: z) tracheophytes have vessels to transport materials

**BONUS**

1. BIOLOGY *Short Answer* : Is studies of the human body, what is used to describe a blood-filled sac formed by an out pouching in an arterial or venous wall?ANSWER: ANEURYSM

**TOSS UP**

1. PHYSICS *Short Answer* A certain machine exerts a force of 200 newtons on a box whose mass is 30 kilograms. The machine moves the box a distance of 20 meters along a horizontal floor. What amount of work does the machine exert on the box?ANSWER: 4000 JOULES

**BONUS**

1. PHYSICS *Multiple Choice* A block of metal which weighs 60 newtons in air and 40 newtons under water has a density, in kilograms per meter cubed, of:w) 1000

x) 3000

y) 5000

z) 7000

ANSWER: x) 3000

**TOSS UP**

1. CHEMISTRY *Multiple Choice* Which of the following terms refers to a material which slows neutrons?

w) retarder

x) moderator

y) buffer

z) bottleneck  
ANSWER: x) Moderator

**BONUS**

1. CHEMISTRY *Multiple Choice* The noble gases have low boiling points because:w) their ionization potentials are very low

x) they are produced by the fractional distillation of liquid air

y) only weak Van der Waals forces hold the atoms together

z) they have eight electrons in the outer shellANSWER: y) only weak Van der Waals forces hold the atoms together

**TOSS UP**

1. EARTH AND SPACE SCIENCE *Short Answer* What is the term used to measure the intensity of solar radiation and is equal to one gram calorie per square centimeter per minute?ANSWER: Langley

**BONUS**

1. EARTH AND SPACE SCIENCE *Multiple Choice* What is the relative humidity when the absolute humidity is 3 grams per cubic meter and the air has a capacity of 12 grams per cubic meter?w) 4%

x) 9%

y) 25%

z) 400%ANSWER: y) 25%

**TOSS UP**

1. MATH *Short Answer* An ellipse is represented by the equation [x2/36] + [y2/16] = 1. What is the length of the major axis of this ellipse?  
     
   ANSWER: 12

**BONUS**

1. MATH *Short Answer* Using an x-y coordinate axis, the figure represented by the equation [x2/36] + [y2/16] =1 is centered about what x-y coordinate point?ANSWER: (0,0)

**TOSS UP**

1. ENERGY *Short Answer* As a safety measure, natural gas companies add what kind of gas so that escaping gas can be detected when drilling for methane?ANSWER: Mercaptan

**BONUS**

1. ENERGY *Short Answer* As of 2009, which sector of consumption utilizes the most Natural Gas?ANSWER: Industrial

**TOSS UP**

1. BIOLOGY *Short Answer* What genetic term describes the situation when a part of a chromosome is broken off and lost?  
     
   ANSWER: Chromosal Deletion

**BONUS**

1. BIOLOGY *Multiple Choice* Of the following 4, name all that are skin receptors in human cells that are sensitive to heat1) end organs of Krause

2) Meissner's corpuscles

3) end organs of Ruffini

4) Pacinian corpuscles  
ANSWER: 3 only

**TOSS UP**

1. PHYSICS *Short Answer* Five volts are applied across the plates of a parallel plate capacitor. The distance of separation of the plates is .02 meters. What is the magnitude of the electric field inside the capacitor?ANSWER: 250 VOLTS PER METER or 250 NEWTONS PER COULOMB

**BONUS**

1. PHYSICS *Short Answer* Five coulombs of charge are placed on a thin-walled conducting shell. Once thecharge has come to rest, the electric potential inside the hollow conducting shell is found to be:w) zero

x) uniform inside the sphere and equal to the electric potential on the surface of the sphere

y) smaller than the electric potential outside the sphere

z) varying as one over r squared.

ANSWER: X) uniform inside the sphere and equal to the electric potential on the surface of the sphere

**TOSS UP**

1. CHEMISTRY *Multiple Choice* The triple bond between the carbon atoms causes acetylene, C2H2, to have which of the following shapes?  
   w) trigonal planar

x) linear

y) tetrahedral

z) trigonal bipyramidal

ANSWER: x) Linear

**BONUS**

1. CHEMISTRY *Multiple Choice* Sucrose, ordinary table sugar, may be classified as a:w) Monosaccharide

x) Polysaccharide

y) Disaccharide

z) OligosaccharideANSWER: y) Disaccharide

**TOSS UP**

1. EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following terms is used to describe the appearance of a mineral in transmitted light? Is it:w) diaphaneity

x) translucence

y) opaqueness

z) porosityANSWER: w) Diaphaneity

**BONUS**

1. EARTH AND SPACE SCIENCE *Short Answer* Give the general term used to designate the sand, silt, and mud deposited by a stream, along its bank or upon its floodplain, during periods of high water.ANSWER: Alluvium or Alluvial

**TOSS UP**

1. MATH *Multiple Choice* The polar equation, r = 3sin(3t), represents which of the following graphs? Is it the graph of a:  
   w) cardioid

x) three-leaved rose

y) Archimedian-spiral

z) limacon

ANSWER: X) THREE-LEAVED ROSE

**BONUS**

1. MATH *Short Answer* Give the equation of one of the circles which satisfy the following criteria: a circle with a radius of 8 which is tangent to the y-axis and whose center lies on the x-axis.ANSWER: (x - 8)2 + (y)2 = 82 or (x + 8)2 + (y)2 = 82

**TOSS UP**

1. ENERGY *Short Answer* In which process of the Uranium Fuel Cycle is the uranium formed into small barrel-shaped pellets?ANSWER: Fuel Fabrication

**BONUS**

1. ENERGY *Short Answer* By name or number, order the following 8 from first to last in the uranium fuel cycle1) Nuclear Reactor

2) Enrichment

3) Mining

4) Conversion

5) Fuel Fabrication

6) Reprocessing

7) Used Fuel Storage

8) MillingANSWER: 3,8,4,2,5,1,7,6

**TOSS UP**

1. BIOLOGY *Multiple Choice* In a plasma membrane, which of the following provides a general barrier to the movement of molecules?  
   w) lipids

x) proteins

y) carbohydrates

z) fiber  
ANSWER: w) lipids

**BONUS**

1. BIOLOGY *Short Answer* What is the term given to a fatty acid that has more than one set of double bonds between carbons?ANSWER: polyunsaturated

**TOSS UP**

1. PHYSICS *Short Answer* Three capacitors with different capacitances are connected in series. Of the following 3 which of the following statements is/are TRUE?1) All three of the capacitors have the same potential difference between their plates.

2) The magnitude of the charge is the same on all of the capacitor plates.

3) The capacitance of the system depends on the voltage applied across the three capacitors.  
ANSWER: 2

**BONUS**

1. PHYSICS *Multiple Choice* When a physical property such as charge exists in discrete "packets" rather than in continuous amounts, the property is said to be:w) discontinuous

x) abrupt

y) quantized

z) noncontinuousANSWER: y) quantized

**TOSS UP**

1. CHEMISTRY *Multiple Choice* In a flame test, the presence of copper in a solution is evident by what color flame?   
   w) red

x) orange

y) indigo

z) blue-green  
ANSWER: Z ) BLUE-GREEN

**BONUS**

1. CHEMISTRY *Short Answer* Which halogen has the largest atomic radius:ANSWER: Astatine

**TOSS UP**

1. EARTH AND SPACE SCIENCE *Short Answer* What is the specific term used by geologists to describe rock weathering in which shells or plates are broken away from a rock leaving it rounded in appearance?ANSWER: Exfoliation

**BONUS**

1. EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following minerals is noted for its one perfect cleavage?w) calcite

x) muscovite

y) quartz

z) pyrite  
ANSWER: x) muscovite

**TOSS UP**

1. MATH *Short Answer* What is the distance between the points P and Q if their cartesian coordinates are (5, 5,1) and (1, 5, -2)?  
     
   ANSWER: 5

**BONUS**

1. MATH *Short Answer* : In the complex plane, what are the roots of the equation x2 + 4x + 8 = 0?ANSWER: 2 - 2i and -2 + 2i

**TOSS UP**

1. ENERGY *Multiple Choice* The concentration of carbon dioxide in the atmosphere is in the range of:w) 1-10 parts per million

x) 10-100 parts per million

y) 100-1000 parts per million

z) 1000-10,000 parts per millionANSWER: Y) 100-1000 PARTS PER MILLION

**BONUS**

1. ENERGY *Short Answer* By what process are hydrogen made in the industrial world?ANSWER: Steam Reforming

**TOSS UP**

1. BIOLOGY *Short Answer* Click here to enter text.  
     
   ANSWER: Click here to enter text.

**BONUS**

1. BIOLOGY *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. PHYSICS *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**BONUS**

1. PHYSICS *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. CHEMISTRY *Short Answer* Click here to enter text.  
     
   ANSWER: Click here to enter text.

**BONUS**

1. CHEMISTRY *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. EARTH AND SPACE SCIENCE *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**BONUS**

1. EARTH AND SPACE SCIENCE *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. MATH *Short Answer* Click here to enter text.  
     
   ANSWER: Click here to enter text.

**BONUS**

1. MATH *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. ENERGY *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**BONUS**

1. ENERGY *Short Answer* Click here to enter text.ANSWER: Click here to enter text.

**TOSS UP**

1. BIOLOGY *Short Answer* Click here to enter text.  
     
   ANSWER: Click here to enter text.

**BONUS**

1. BIOLOGY *Short Answer* Click here to enter text.ANSWER: Click here to enter text.