ROUND 1

TOSS-UP

1) BIOLOGY  *Short Answer*  What is the most common name for the vector for Rocky Mountain Spotted Fever?

ANSWER: TICK

BONUS

1) BIOLOGY  *Short Answer*  Binomial nomenclature is classically made up of what two taxonomical terms?

ANSWER: GENUS AND SPECIES

TOSS-UP

2) CHEMISTRY  *Short Answer*  In the periodic table, the number found above each atomic symbol represents what value?

ANSWER: ATOMIC NUMBER (ACCEPT: NUMBER OF PROTONS)

BONUS

2) CHEMISTRY  *Short Answer*  How many molecules of HCl are in 1 mole of HCl?

ANSWER: $6.022 \times 10^{23}$ (ACCEPT: $6.023 \times 10^{23}$ OR AVOGADRO’S NUMBER)
TOSS-UP

3) PHYSICS Multiple Choice What property of waves allows them to bend around the edges of an obstacle:

W) reflection  
X) diffraction  
Y) deflection  
Z) dispersion

ANSWER: X) DIFFRACTION

BONUS

3) PHYSICS Short Answer Considered by some as the forgotten father of electricity and technology, what person was the inventor of the alternating current motor and created a device in Colorado Springs that was able to produce bolts of lightning 130 feet long:

ANSWER: (NIKOLA) TESLA

TOSS-UP

4) ASTRONOMY Multiple Choice The Taurids is to November as the Perseids is to:

W) July  
X) August  
Y) September  
Z) October

ANSWER: X) AUGUST

BONUS

4) ASTRONOMY Multiple Choice Which of the following is the main component of the atmosphere of Mars:

W) hydrogen  
X) helium  
Y) nitrogen  
Z) carbon dioxide

ANSWER: Z) CARBON DIOXIDE
TOSS-UP

5) MATH Multiple Choice Which of the following is a rational number:

W) \(2 + \sqrt{5}\) (read as: \(2 + \) the square root of 5)
X) \(\sqrt{3}\)
Y) \(\sqrt{4/9}\)
Z) \(\sqrt{6}\)

ANSWER: Y) \(\sqrt{4/9}\)

BONUS

5) MATH Short Answer If you count from 1 to 100, how many 9's will you pass on the way?

ANSWER: 20

TOSS-UP

6) EARTH SCIENCE Short Answer What is the term for a vent in the surface of the Earth, from which magma, solid rock debris, and gases erupt?

ANSWER: VOLCANO

BONUS

6) EARTH SCIENCE Multiple Choice Mount Rainier, Mount Baker and Mount Hood in the U.S. are all examples of:

W) stratovolcanoes
X) tephra cone volcanoes
Y) shield volcanoes
Z) basaltic lava volcanoes

ANSWER: W) STRATOVOCANOES
TOSS-UP

7) GENERAL SCIENCE  Short Answer  Express the number 0.051 in proper scientific notation with the correct amount of significant figures:

ANSWER: 5.1 \times 10^{-2}

BONUS

7) GENERAL SCIENCE  Short Answer  Rounded to the nearest decimal place, what is the Kelvin equivalent of -60°C?

ANSWER: 213

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TOSS-UP

8) COMPUTER SCIENCE  Short Answer  The binary number 1010 (read as: one, zero, one, zero) is equivalent to what decimal number?

ANSWER: 10

(Solution: 2 + 8 = 10)

BONUS

8) COMPUTER SCIENCE  Short Answer  What does the acronym RDRAM stand for?

ANSWER: RAMBUS DYNAMIC RANDOM ACCESS MEMORY
TOSS-UP

9) BIOLOGY Short Answer A lack of the neurotransmitter dopamine in the brain of humans causes what disease:

ANSWER: PARKINSON’S

BONUS

9) BIOLOGY Multiple Choice Which of the following is NOT typically considered part of the immune system:

W) Kupffer cell
X) mast cell
Y) eosinophile (pronounced: E-O-sin-o-fill)
Z) fibroblast

ANSWER: Z) FIBROBLAST

TOSS-UP

10) CHEMISTRY Short Answer The atomic number represents the number of what in an atom?

ANSWER: PROTONS (ACCEPT: ELECTRONS OR PROTONS) (DO NOT ACCEPT: PROTONS PLUS ELECTRONS)

BONUS

10) CHEMISTRY Short Answer From the lowest to the highest atomic number, give the full names of the first 4 halogens:

ANSWER: FLUORINE; CHLORINE; BROMINE; IODINE
TOSS-UP

11) PHYSICS  Short Answer  A white-colored object illuminated by a yellow light will appear as what color to the human eye?

ANSWER: YELLOW

BONUS

11) PHYSICS  Short Answer  What is the current, in amperes, through a 1200 watt heater running on a 120 volt power source:

ANSWER: 10

(Solution: current = watts/volts; 1200/120 = 10 ampere)

TOSS-UP

12) ASTRONOMY  Short Answer  Which planet in our solar system has the strongest magnetic field?

ANSWER: JUPITER

BONUS

12) ASTRONOMY  Multiple Choice  The Andromeda Galaxy is which of the following types of galaxies:

W) elliptical
X) irregular
Y) spiral
Z) barred spiral

ANSWER: Y) SPIRAL
TOSS-UP

13) MATH Short Answer What is the area of a right triangle whose leg lengths are 6 and 8 and whose hypotenuse is 10?

ANSWER: 24

(Solution: \( A = \frac{1}{2} bh; \ \frac{1}{2} (6)(8); = 24 \))

BONUS

13) MATH Multiple Choice Which of the following numbers is divisible by 3:

W) 2,393
X) 32,413
Y) 43,173
Z) 7133

ANSWER: Y) 43,173

(Solution: sum of the numbers divisible by 3)

TOSS-UP

14) EARTH SCIENCE Multiple Choice Seawater covers approximately what percent of the earth’s surface:

W) 46
X) 71
Y) 82
Z) 92

ANSWER: X) 71

BONUS

14) EARTH SCIENCE Short Answer What is the name for the natural level of water in a soil or rock, below which the soil or rock is saturated:

ANSWER: WATER TABLE
TOSS-UP

15) GENERAL SCIENCE  *Short Answer*  How many sides does a Mobius Strip have?

ANSWER: ONE

BONUS

15) GENERAL SCIENCE  *Short Answer*  How many significant figures are in the number 0.024424?

ANSWER: 5

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TOSS-UP

16) COMPUTER SCIENCE  *Multiple Choice*  What is the smallest unit of information on a computer system:

W) bit  
X) byte  
Y) nanobyte  
Z) exabyte

ANSWER: W) BIT

BONUS

16) COMPUTER SCIENCE  *Multiple Choice*  What is the hexadecimal equivalent of the binary number 110 (read as: one, one, zero, one)?

W) C  
X) D  
Y) E  
Z) F

ANSWER: X) D
TOSS-UP

17) BIOLOGY Short Answer The phelloderm, cork cambium, and all the tissues outside the innermost secondary phloem compose what common plant structure?

ANSWER: BARK

BONUS

17) BIOLOGY Multiple Choice Blood belongs to which of the following animal tissues types:

W) epithelial (ep-i-theél-i-al)
X) connective
Y) nervous
Z) muscle

ANSWER: X) CONNECTIVE

TOSS-UP

18) CHEMISTRY Short Answer How many electrons are found in the outer electron shell of halogens?

ANSWER: 7

BONUS

18) CHEMISTRY Short Answer What is the maximum number of the electrons that can occupy the second shell of an atom?

ANSWER: 8
TOSS-UP

19) PHYSICS  Multiple Choice  Which of the following physical phenomena must travel through some sort of physical medium:

W) visible light
X) sound
Y) radiant energy
Z) gamma rays

ANSWER: X) SOUND

BONUS

19) PHYSICS  Multiple Choice  A receiver tuned into the VHF band would be receiving which of the following wavelength bands:

W) 0.1 to 1 meters
X) 1 to 10 meters
Y) 10 to 100 meters
Z) 100 to 1000 meters

ANSWER: X) 1 TO 10 METERS

TOSS-UP

20) ASTRONOMY  Multiple Choice  Which of the following moon features is named Copernicus:

W) a sea
X) a crater
Y) a mountain range
Z) a rill

ANSWER: X) A CRATER

BONUS

20) ASTRONOMY  Short Answer  The Earth is actually closest to the Sun during what month?

ANSWER: JANUARY
TOSS-UP

21) MATH Short Answer What is the sum of the interior angles of a 5-sided polygon?

ANSWER: 540°

BONUS

21) MATH Short Answer Find the prime factorization of 600:

ANSWER: \(2 \times 2 \times 2 \times 3 \times 5 \times 5\) (ACCEPT: \(2^3 \times 3 \times 5^2\))

TOSS-UP

22) EARTH SCIENCE Short Answer Found on river floodplains, what are the small arc-shaped lakes that represent part of the former course of a river:

ANSWER: OXBOw LAKES

BONUS

22) EARTH SCIENCE Short Answer Name the two predominate gases which compose Earth’s atmosphere:

ANSWER: NITROGEN AND OXYGEN
TOSS-UP

23) BIOLOGY Multiple Choice Which of the following trees has a simple pinnate (Pron: pin-nate) leaf with a serrated margin and net venation:

W) Apple  
X) Sassafras  
Y) White Oak  
Z) American Elm

ANSWER: Z) AMERICAN ELM

BONUS

23) BIOLOGY Short Answer What is the common scientific term for the protein complex that holds homologous pairs of chromosomes together after synapsis has occurred?

ANSWER: SYNAPTONEMAL (Pron: sin-apt-o-nee-mal) COMPLEX

TOSS-UP

24) CHEMISTRY Multiple Choice Which of the following is TRUE about sodium:

W) it is the 2nd most reactive of the alkali metals  
X) it is the 3rd most abundant element in the Earth’s crust  
Y) it was first prepared in 1807 from potash  
Z) it is a soft, shiny metal

ANSWER: Z) IT IS A SOFT, SHINY METAL

BONUS

24) CHEMISTRY Short Answer A peptide bond in a polypeptide molecule is between which two atomic elements?

ANSWER: CARBON AND NITROGEN
TOSS-UP

25) PHYSICS  Short Answer  What is the common scientific term for the ratio of the density of a material to that of water at 4°C?

ANSWER: SPECIFIC GRAVITY

BONUS

25) PHYSICS  Multiple Choice  Which of the following is the best reason that cigarette smoke is bluish when lit by sunlight:

W) scattering intensity is inversely related to the forth power of the incident wavelength
X) the light is diffracted preferentially in the blue region
Y) the carbon dioxide in the smoke absorbs all other frequencies except blue
Z) each smoke particle disperses the light like a rainbow and the blue region is easiest to see in daylight

ANSWER: W)  SCATTERING INTENSITY IS INVERSELY RELATED TO THE FORTH POWER OF THE INCIDENT WAVELENGTH