

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: 6.022×10^{23} (ACCEPT: 6.023×10^{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) STRATOVOLCANOES

TOSS-UP

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

ANSWER: 5.1×10^{-2}

BONUS

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

ANSWER: 213

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: $A = 1/2 bh$; $1/2 (6)(8)$; = 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

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 1101 (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: pinnate) 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 fourth 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 FOURTH POWER OF THE INCIDENT WAVELENGTH