

## ROUND ROBIN 7

### TOSS-UP

\*1) **GENERAL SCIENCE** *Multiple Choice* Which of the following acids is NOT a flavoring used in foods?

- W) acetic acid
- X) lactic acid
- Y) citric acid
- Z) nitric acid

ANSWER: Z) NITRIC ACID

### BONUS

1) **GENERAL SCIENCE** *Multiple Choice* Which of the following is used to focus the electron beam in an electron microscope?

- W) condensers
- X) electromagnets
- Y) glass lenses
- Z) gonculators

ANSWER: X) ELECTROMAGNETS

### TOSS-UP

2) **MATH** *Short Answer* What is the square root of 0.49?

ANSWER: 0.7

### BONUS

2) **MATH** *Short Answer* Simplify the following algebraic expression:  $3x^2 + 4 - (3x + 2 - x^2)$

ANSWER:  $4x^2 - 3x + 2$

### TOSS-UP

3) **LIFE SCIENCE** *Multiple Choice* Which is not a basic muscle type in the human body?

- W) smooth
- X) skeletal
- Y) ventricular
- Z) cardiac

ANSWER: Y) VENTRICULAR

### BONUS

3) **LIFE SCIENCE** *Multiple Choice* Stamen is to anther as carpel is to:

- W) sepal
- X) ovary
- Y) egg
- Z) pollen

ANSWER: X) OVARY

### TOSS-UP

4) **EARTH SCIENCE** *Multiple Choice* Eighty percent of the magma that results from a volcanic eruption is of what substance?

- W) basalt
- X) rhyolite
- Y) andesite
- Z) silicon dioxide

ANSWER: W) BASALT

### BONUS

4) **EARTH SCIENCE** *Multiple Choice* Each day, most coastal beaches encounter:

- W) one high tide and one low tide
- X) two high tides and one low tide
- Y) two high tides and two low tides
- Z) three high tides and three low tides

ANSWER: Y) TWO HIGH TIDES AND TWO LOW TIDES

**TOSS-UP**

**5) GENERAL SCIENCE** *Multiple Choice* Which of the following is most typically used as a unit of measurement for pressure:

- W) pascal
- X) dyne
- Y) weber
- Z) tesla

ANSWER: W) PASCAL

**BONUS**

**\*5) GENERAL SCIENCE** *Multiple Choice* Which of the following household items is the best example of containing matter in the plasma state?

- W) fluorescent light
- X) toaster oven
- Y) blender
- Z) microwave oven

ANSWER: W) FLUORESCENT LIGHT

**TOSS-UP**

**6) EARTH SCIENCE** *Multiple Choice* The last two stars in the bowl of the big dipper point to which of the following?

- W) Vega
- X) Cassiopeia
- Y) Scorpio
- Z) Polaris

ANSWER: Z) POLARIS

**BONUS**

**6) EARTH SCIENCE** *Short Answer* What is an area on earth that does not receive seismic waves during an earthquake called?

ANSWER: SHADOW ZONE

### TOSS-UP

\*7) **PHYSICAL SCIENCE** *Multiple Choice* Certain products have been designed so that people wearing headphones do not hear the objectionably loud sound from certain machinery with which they are working. These headphones work based on which one of the following principles:

- W) doppler effect
- X) destructive interference
- Y) constructive interference
- Z) audipolarization

ANSWER: X) DESTRUCTIVE INTERFERENCE

### BONUS

\*7) **PHYSICAL SCIENCE** *Multiple Choice* In chemical reactions when bonds between atoms are broken which of the following is most correct:

- W) energy is always needed
- X) both heat and light are always emitted
- Y) energy is always released
- Z) they cannot be repaired

ANSWER: W) ENERGY IS ALWAYS NEEDED

### TOSS-UP

8) **MATH** *Multiple Choice* If the average speed of a bicyclist is 2 meters/second for one kilometer, then the biker must have traveled the entire distance and:

- W) stayed at 2 meters/second
- X) did not encounter hills
- Y) did not stop
- Z) took 500 seconds

ANSWER: Z) TOOK 500 SECONDS

### BONUS

8) **MATH** *Short Answer* Simplify the following algebraic expression:  $2x + 3(y + 3z + x)$

ANSWER:  $5x + 3y + 9z$



### TOSS-UP

9) **PHYSICAL SCIENCE** *Short Answer* If the distance separating two charges is tripled, the force between them decreases by what factor?

ANSWER: 9

### BONUS

\*9) **PHYSICAL SCIENCE** *Multiple Choice* The reason why a beach ball held under the surface will pop up when released is because:

- W) the buoyant force has a net upward direction
- X) gravity is only acting at the surface
- Y) the pressure of the water is only in the upward direction
- Z) the ball is lighter than air

ANSWER: W) THE BUOYANT FORCE HAS A NET UPWARD DIRECTION

### TOSS-UP

10) **MATH** *Short Answer* Reduce  $\frac{18}{54}$  to its lowest fraction:

ANSWER:  $\frac{1}{3}$

### BONUS

10) **MATH** *Short Answer* Find the value of  $4x - 6y$  if  $x = -2$  and  $y = -3$ :

ANSWER: 10

### TOSS-UP

**11) LIFE SCIENCE** *Multiple Choice* The receptors in the retina of the eye that detect faint light and transfer non-color impulses to the brain are:

- W) corpuscles
- X) rods
- Y) cones
- Z) axons

ANSWER: X) RODS

### BONUS

**11) LIFE SCIENCE** *Multiple Choice* Which of the following does NOT occur in mitosis:

- W) DNA synthesis
- X) sets of sister chromatids line up singly
- Y) sister chromatids separate as the centromere divides
- Z) spindle fibers help in the movement of chromosomes

ANSWER: W) DNA SYNTHESIS

### TOSS-UP

**10) PHYSICAL SCIENCE** *Multiple Choice* Which of the following is the emission source for microwaves in a typical microwave oven:

- W) small cyclotron
- X) cadmium disk bombarded with a soft x-ray source
- Y) magnetron
- Z) laser lamp

ANSWER: Y) MAGNETRON

### BONUS

**\*10) PHYSICAL SCIENCE** *Multiple Choice* The red color in firework displays on the Fourth of July is caused by which element?

- W) lithium
- X) sodium
- Y) copper
- Z) iron

ANSWER: W) LITHIUM

**TOSS-UP**

**13) EARTH SCIENCE** *Multiple Choice* Which of the following is a calcite-rich carbonate rock:

- W) limestone
- X) dolostone
- Y) shale
- Z) sandstone

ANSWER: W) LIMESTONE

**BONUS**

**13) EARTH SCIENCE** *Short Answer* What is the hot, putty like layer of Earth's mantle located from about 75 to 300 kilometers below the surface, where rocks have little strength?

ANSWER: ASTHENOSPHERE

**TOSS-UP**

**14) LIFE SCIENCE** *Multiple Choice* Which of the following is an example of a multiple fruit?

- W) pear
- X) grape
- Y) pineapple
- Z) orange

ANSWER: Y) PINEAPPLE

**BONUS**

**14) LIFE SCIENCE** *Short Answer* Binomial nomenclature is classically made up of what two taxonomical terms?

ANSWER: GENUS and SPECIES

### TOSS-UP

15) EARTH SCIENCE *Short Answer* What is the name of a mixture of molten rock, suspended mineral grains, and dissolved gases that forms within the crust or mantle of the Earth when temperatures are sufficiently high?

ANSWER: MAGMA (DO NOT ACCEPT: LAVA)  
(Solution: magma becomes lava when it erupts at the surface)

### BONUS

15) EARTH SCIENCE *Multiple Choice* A famous downslope wind that occurs in North America on the East side of the Rocky Mountains is called a:

- W) sirocco
- X) mistral
- Y) foehn
- Z) chinook

ANSWER: Z) CHINOOK

### TOSS-UP

16) LIFE SCIENCE *Multiple Choice* Spallanzani, Reti and Pasteur were all:

- W) helpful in disproving the theory of spontaneous generation
- X) great Italian chefs
- Y) scientists who supported the genetic work of Mendel
- Z) supporters of the work of Charles Darwin

ANSWER: W) HELPFUL IN DISPROVING THE THEORY OF SPONTANEOUS GENERATION

### BONUS

16) LIFE SCIENCE *Short Answer* What organ of the human body is primarily responsible for removing abnormal red blood cells from the circulation ?

ANSWER: SPLEEN

**TOSS-UP**

**17) GENERAL SCIENCE** *Multiple Choice* Which of the following is a gas which presents a serious risk for cancer to thousands of Americans?

- W) Chlorine
- X) Argon
- Y) Neon
- Z) Radon

ANSWER: Z) RADON

**BONUS**

**17) GENERAL SCIENCE** *Short Answer* What fibrous protein found in nature is well known by scientists to be stronger by weight than steel?

ANSWER: SILK

**TOSS-UP**

**18) GENERAL SCIENCE** *Multiple Choice* Which of the following is the boiling point of water in the Kelvin temperature scale:

- W) 212.13
- X) 262.17
- Y) 373.18
- Z) 459.72

ANSWER: Y) 373.18

**BONUS**

**18) GENERAL SCIENCE** *Multiple Choice* If you want to specify the position of an object you must use:

- W) a reference point
- X) its mass
- Y) metric units
- Z) a meter tape

ANSWER: W) A REFERENCE POINT



### TOSS-UP

19) **EARTH SCIENCE** *Multiple Choice* A rising barometer and clear skies indicate an approaching:

- W) warm front
- X) high-pressure area
- Y) low-pressure area
- Z) cold front

ANSWER: X) HIGH-PRESSURE AREA

### BONUS

19) **EARTH SCIENCE** *Multiple choice* You find a mineral in the local rock shop. You know it is composed of carbonate, that it has perfect rhombohedral cleavage, and when you look through at the text on a nearby newspaper, you find it exhibits the property of double refraction. This mineral would most likely be which of the following:

- W) mica
- X) calcite
- Y) basalt
- Z) halite

ANSWER: X) CALCITE

### TOSS-UP

20) **MATH** *Short Answer* What is the least common denominator for the following operation:

$$\frac{1}{2} + \frac{2}{3} + \frac{4}{5}$$

ANSWER: 30

### BONUS

20) **MATH** *Short Answer* If in a sequence of natural numbers, starting with 2, you begin eliminating every second number after 2, then every third number after 3, then every fourth number after 4, and so on, what type of numbers will be left?

ANSWER: PRIME NUMBERS

### TOSS-UP

**21) PHYSICAL SCIENCE** *Short Answer* Where is the gravitational force the greatest for a uniform spherical planet:

ANSWER: AT ITS SURFACE

### BONUS

**\*21) PHYSICAL SCIENCE** *Multiple Choice* Which best explains the idea of conservation of matter in chemical reactions:

- W) atoms are neither created or destroyed
- X) the number of reactant molecules must equal the number of product molecules
- Y) energy and matter are equivalent
- Z) bond are either formed and/or broken

ANSWER: W) ATOMS ARE NEITHER CREATED OR DESTROYED

### TOSS-UP

**22) GENERAL SCIENCE** *Multiple Choice* In a mercury barometer, which of the following is the typically reported height of the column of mercury that is required to balance against the pressure of 1 atmosphere?

- W) 760 millimeters
- X) 14 pounds per square inch
- Y) 1 meter
- Z) 32 inches

ANSWER: W) 760 MILLIMETERS

### BONUS

**\*22) GENERAL SCIENCE** *Multiple Choice* For a given compound, motion at the molecular level is:

- W) greatest for gases
- X) greatest for solid
- Y) least for liquids
- Z) least for gases

ANSWER: W) GREATEST FOR GASES

### TOSS-UP

23) **PHYSICAL SCIENCE** *Short Answer* What is the following statement most commonly known as: "A body immersed in a fluid is supported by a force equal to the weight of the fluid it displaces."

ANSWER: ARCHIMEDES' PRINCIPLE

### BONUS

\*23) **PHYSICAL SCIENCE** *Multiple Choice* Boats made of iron and steel will float because:

- W) iron and steel are less dense than water
- X) the water displaced by the boat weighs more than the boat
- Y) surface tension holds the boat up
- Z) iron and steel are more dense than water

ANSWER: X) THE WATER DISPLACED BY THE BOAT WEIGHS MORE THAN THE BOAT

### TOSS-UP

24) **LIFE SCIENCE** *Short Answer* A potato is a swollen underground stem that stores food for the plant. What is the scientific term for the swollen area?

ANSWER: TUBER

### BONUS

24) **LIFE SCIENCE** *Short Answer* Give the common colloquial names in respective order for the following 3 anatomical structures: patella, scapula, hallux

ANSWER: KNEE CAP, SHOULDER BLADE, BIG TOE

### TOSS-UP

25) **MATH** *Short Answer* What is the length of the hypotenuse of a right triangle whose other two sides are 6 and 8 units long?

ANSWER: 10

### BONUS

25) **MATH** *Short Answer* If you were to invest \$1000 in a savings account that pays 5% simple annual interest, how much interest in dollars will you earn in 1 year?

ANSWER: \$50