## ROUND 4

## TOSS-UP

1) MATH Multiple Choice Which of the following is NOT true:
W) an irrational number is one that cannot be expressed as the ratio of integers
X) fractions equal to 1 are called mixed fractions
Y) the numerator is less than the denominator in a proper fraction
Z) a composite number is a positive integer greater than 1 that is not prime

ANSWER: X) FRACTIONS EQUAL TO 1 ARE CALLED MIXED FRACTIONS

## BONUS

1) MATH Short Answer Reduce the following fraction to a mixed fraction in lowest terms: $\frac{290}{25}$

ANSWER: $11 \frac{3}{5}$

## TOSS-UP

2) GENERAL SCIENCE Short Answer Rounded to the nearest whole number, what is the specific gravity of water at standard temperature and pressure?

ANSWER: 1

## BONUS

2) GENERAL SCIENCE Short Answer Arrange the following 4 choices in order of INCREASING speed of computer data transmission: 1 gigabyte per second; 1 kilobyte per second; 1 megabyte per second; 1 terabyte per second

ANSWER: 1 KILOBYTE PER SECOND; 1 MEGABYTE PER SECOND; 1 GIGABYTE PER SECOND; 1 TERABYTE PER SECOND

## TOSS-UP

3) LIFE SCIENCE Multiple Choice In which of the following places would meiosis most likely occur in a mammal:
W) skin
X) liver
Y) heart
Z) ovary

ANSWER: Z) OVARY

## BONUS

3) LIFE SCIENCE Short Answer What are the most common names of the gametes produced by a human male and female, respectively?

ANSWER: MALE = SPERM; FEMALE = EGG (ACCEPT: SPERM AND OVUM)

## TOSS-UP

4) PHYSICAL SCIENCE Short Answer An empty plastic soda bottle is closed tightly at an elevation of 10,000 feet elevation and brought back to sea level. What is the visible condition of the bottle?

ANSWER: IT IS CRUSHED
(ACCEPT: COLLAPSED OR ANY OTHER REASONABLE SYNONYM)

## BONUS

4) PHYSICAL SCIENCE Short Answer Name all of the following 3 choices that are physical properties of an object: length; mass; density

ANSWER: ALL

## TOSS-UP

5) EARTH SCIENCE Multiple Choice A mangrove coast is likely to be found in which of the following locations:
W) Alaskan Peninsula
X) Hawaiian Islands
Y) Florida
Z) Maine

ANSWER: Y) FLORIDA

## BONUS

5) EARTH SCIENCE Multiple Choice Which of the following is most important for climate because it transports large amounts of heat and moisture from the ocean to land:
W) tides
X) monsoons
Y) longshore drift
Z) erosion

ANSWER: X) MONSOONS

## TOSS-UP

6) MATH Multiple Choice 0.143 is closest in value to which of the following fractions:
W) $1 / 7$
X) $3 / 9$
Y) $2 / 5$
Z) $5 / 8$

ANSWER: W) 1/7

## BONUS

6) MATH Short Answer Evaluate the following and give your answer as a mixed fraction in lowest terms: $2 \frac{1}{6} \times \frac{13}{25}$

ANSWER: $1 \frac{19}{150}$

## TOSS-UP

7) GENERAL SCIENCE Short Answer Rounded to the nearest whole number, what is absolute zero in degrees Celsius?

ANSWER: -273

## BONUS

7) GENERAL SCIENCE Short Answer Convert 1 million centimeters per hour into kilometers per hour:

ANSWER: 10

## TOSS-UP

8) LIFE SCIENCE Short Answer What anatomical structures in humans function by connecting muscles to bones?

ANSWER: TENDONS

## BONUS

8) LIFE SCIENCE Short Answer What is the light-yellow fluid that makes up the fluid portion of normal circulating human blood?

ANSWER: PLASMA (DO NOT ACCEPT: SERUM)

## TOSS-UP

9) PHYSICAL SCIENCE Short Answer A screw driver and a doorknob are considered variations of what simple machine?

ANSWER: WHEEL AND AXLE

## BONUS

9) PHYSICAL SCIENCE Short Answer Consider a lever with an ideal mechanical advantage of 8. What will its mechanical advantage be if the effort arm length is reduced by $1 / 2$ ?

ANSWER: 4

## TOSS-UP

10) EARTH SCIENCE Multiple Choice Bioluminescence in marine organisms is important for all but which of the following functions:
W) attracting prey
X) communicating with other organisms
Y) illumination
Z) buoyancy

ANSWER: Z) BUOYANCY

## BONUS

10) EARTH SCIENCE Multiple Choice Magmas that crystallize beneath the Earth's surface form intrusive bodies of igneous rock that are generally known as:
W) pumice
X) plutons
Y) tuffs
Z) breccia

ANSWER: X) PLUTONS

## TOSS-UP

11) MATH Short Answer Convert $0.000328 \times 10^{-6}$ into proper scientific notation:

ANSWER: $3.28 \times 10^{-10}$

## BONUS

11) MATH Short Answer How many numbers from 1 through 30 are multiples of 3 ? ANSWER: 10

## TOSS-UP

12) GENERAL SCIENCE Short Answer Whereas mass is measured in kilograms, what SI unit is the most common measure of an object's weight?

ANSWER: NEWTON(S)

## BONUS

12) GENERAL SCIENCE Multiple Choice On the earth's surface, which of the following is CLOSEST to the mass of 1,000 pounds:
W) 454 kilograms
X) 2,200 kilograms
Y) 1 ton
Z) 1 kiloton

ANSWER: W) 454 KILOGRAMS

## TOSS-UP

13) LIFE SCIENCE Multiple Choice Most biological catalysts are:
W) proteins
X) vitamins
Y) carbohydrates
Z) lipids

ANSWER: W) PROTEINS

## BONUS

13) LIFE SCIENCE Multiple Choice Which of the following best describes a bacteriophage:
W) a bacterial virus
X) a stage in the development of most bacteria
Y) the release of disease-causing bacteria from a host organism
Z) a very small bacteria

ANSWER: W) A BACTERIAL VIRUS

## TOSS-UP

14) PHYSICAL SCIENCE Multiple Choice Which of the following will occur when an unbalanced force acts on an object:
W) the object will stop
X) the object will lose heat
Y) the object will accelerate
Z) the object will melt

## ANSWER: Y) THE OBJECT WILL ACCELERATE

## BONUS

14) PHYSICAL SCIENCE Short Answer What is the average acceleration, in kilometers per hour per second to the first decimal place, of a bird flying in a straight path from 0 to 50 kilometers per hour in 4 minutes and 10.0 seconds?

ANSWER: 0.2
(Solution: 50/250 = $0.2 \mathrm{~km} / \mathrm{hr} / \mathrm{sec}$ )

## TOSS-UP

15) EARTH SCIENCE Multiple Choice Which of the following terms best describes the crystal form of a mineral:
W) tabular
X) fluorescent
Y) metallic
Z) vitreous

ANSWER: W) TABULAR

## BONUS

15) EARTH SCIENCE Multiple Choice Which of the following is the most common group of rock-forming minerals:
W) sulfides
X) carbonates
Y) phosphates
Z) silicates

ANSWER: Z) SILICATES

## TOSS-UP

16) MATH Multiple Choice Which of the following is an expression for the perimeter of a rectangle if the length equals 10 A and the width equals 6B:
W) $10 \mathrm{~A} \times 6 \mathrm{~B}$
X) $20 \mathrm{~A}+12 \mathrm{~B}$
Y) $2(20 \mathrm{~A})+2(12 \mathrm{~B})$
Z) $10 \mathrm{~A}^{2}+6 \mathrm{~B}^{2}$

ANSWER: X) 20A + 12B

## BONUS

16) MATH Short Answer Giving your answer in dollars and cents, if 2 Frisbees cost $\$ 16.50$, how much will 5 Frisbees cost?

ANSWER: $\$ 41.25$

## TOSS-UP

17) GENERAL SCIENCE Multiple Choice Which of the following is the MOST likely underlying reason why trees evolved with the capacity to grow tall:
W) to absorb more carbon dioxide
X) to enhance transpiration
Y) to compete for sunlight
Z) to produce more oxygen

ANSWER: Y) TO COMPETE FOR SUNLIGHT

## BONUS

17) GENERAL SCIENCE Multiple Choice Consider a star observed just above the horizon in the western sky at dusk. Where would it most likely have been at sunrise that day:
W) in the same position
X) just above the horizon in the eastern sky
Y) high in the western sky
Z) high in the southern sky

ANSWER: X) JUST ABOVE THE HORIZON IN THE EASTERN SKY

## TOSS-UP

18) LIFE SCIENCE Multiple Choice Which of the following plants is sometimes called a fiddlehead when it is immature:
W) maple tree
X) tulip
Y) moss
Z) fern

ANSWER: Z) FERN

## BONUS

18) LIFE SCIENCE Short Answer Name all of the following 4 groups of animals that are reptiles: lizards; snakes; frogs; crocodiles

ANSWER: LIZARDS; SNAKES; CROCODILES (ACCEPT: ALL BUT FROG)

## TOSS-UP

19) PHYSICAL SCIENCE Short Answer The exchange or sharing of what atomic particle is most directly involved in chemical bonding?

ANSWER: ELECTRONS

## BONUS

19) PHYSICAL SCIENCE Short Answer How many valence electrons are in an oxygen atom, which resides in group 16 or 6A of the Periodic Table?

ANSWER: 6

## TOSS-UP

20) EARTH SCIENCE Multiple Choice Which of the following would be used on a weather map to indicate a cold day in winter with clear, blue skies:
W) capital L
X) capital H
Y) green shaded areas
Z) pink shaded areas

ANSWER: X) CAPITAL H

## BONUS

20) EARTH SCIENCE Short Answer What is the name for the northern-most latitude where the Sun can appear directly overhead?

ANSWER: THE TROPIC OF CANCER (ACCEPT: NORTHERN TROPIC)

## TOSS-UP

21) MATH Short Answer Simplify the following expression by using the Distributive Property: $-3(2 x-6 y+3)$

ANSWER: $-6 x+18 y-9$ (ACCEPT: $18 y-6 x-9)$

## BONUS

21) MATH Short Answer If exterior angles at two of the vertices of a triangle are $70^{\circ}$ and $145^{\circ}$, what is the measure of an exterior angle at the third vertex, in degrees?

ANSWER: 145

## TOSS-UP

22) GENERAL SCIENCE Short Answer What is the astronomical term for the bright trail of a meteoroid passing through the atmosphere of the Earth?

ANSWER: METEOR

## BONUS

22) GENERAL SCIENCE Multiple Choice Which of the following foods contains the MOST calories:
W) 1, twelve-ounce non-diet soda
X) 1 tablespoon catsup
Y) 18 -ounce fresh orange
Z) 1 tablespoon white, granulated sugar

ANSWER: W) 1, TWELVE-OUNCE NON-DIET SODA

## TOSS-UP

23) LIFE SCIENCE Short Answer How many pairs of walking legs do spiders have?

ANSWER: 4

## BONUS

23) LIFE SCIENCE Short Answer Name all of the following 4 organisms that are bivalves: squid; clams; snails; mussels

ANSWER: CLAMS; MUSSELS

## TOSS-UP

24) PHYSICAL SCIENCE Short Answer Consider a yo-yo swinging on the end of a string in uniform circular motion. What is the most accurate term for the center-seeking force exerted on the yo-yo through the string?

ANSWER: CENTRIPETAL

## BONUS

24) PHYSICAL SCIENCE Short Answer What are the four basic forces of the universe?

ANSWER: GRAVITY; ELECTROMAGNETISM; STRONG (FORCE); WEAK (FORCE) (ACCEPT: GRAVITATION or GRAVITATIONAL FOR GRAVITY)

## TOSS-UP

25) EARTH SCIENCE Multiple Choice Which of the following is a highly crystalline mineral with perfect cleavage:
W) native gold
X) native silver
Y) graphite
Z) halite

ANSWER: Z) HALITE

## BONUS

25) EARTH SCIENCE Short Answer What period of the Geological Time Scale ends with the extinction of dinosaurs?

ANSWER: CRETACEOUS

