

## ROUND 6

### TOSS-UP

1) LIFE SCIENCE *Multiple Choice* Which of the following anatomical structures is missing in the hagfish:

- W) heart
- X) brain
- Y) notocord
- Z) jaw

ANSWER: Z) JAW

### BONUS

1) LIFE SCIENCE *Short Answer* Name all of the following 4 organisms that are echinoderms: squid; snails; starfish; lobsters

ANSWER: STARFISH

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### TOSS-UP

2) PHYSICAL SCIENCE *Multiple Choice* Which of the following is the most common electronic device used for storing electric energy in a process commonly called charging:

- W) capacitor
- X) transformer
- Y) rectifier
- Z) semiconductor

ANSWER: W) CAPACITOR

### BONUS

2) PHYSICAL SCIENCE *Short Answer* What modern solid-state electronic device is used as an amplifier in modern radios and, through its wide use as an electronic switch, is a basic component in modern logic circuits?

ANSWER: TRANSISTOR

### TOSS-UP

3) EARTH SCIENCE *Multiple Choice* Giant kelp found in oceans do NOT possess which of the following structures:

- W) holdfasts
- X) gas bladders
- Y) stipes
- Z) roots

ANSWER: Z) ROOTS

### BONUS

3) EARTH SCIENCE *Short Answer* What numerical albedo value is given to a surface that reflects 100% of incident light?

ANSWER: 1

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### TOSS-UP

4) MATH *Multiple Choice* Which of the following is TRUE:

- W) every real number has a reciprocal
- X) the product of two integers is always positive
- Y) the quotient times the divisor equals the dividend
- Z) the product of two numbers is greater than either factor

ANSWER: Y) THE QUOTIENT TIMES THE DIVISOR EQUALS THE DIVIDEND

### BONUS

4) MATH *Short Answer* Evaluate the following and give your answer as a proper fraction in

lowest terms:  $\frac{3}{16} + \frac{5}{8} - \frac{1}{4}$

ANSWER:  $\frac{9}{16}$

### TOSS-UP

5) GENERAL SCIENCE *Multiple Choice* People who are lactose intolerant are unable to digest the sugar present in which of the following:

- W) milk
- X) wheat
- Y) peanuts
- Z) eggs

ANSWER: W) MILK

### BONUS

5) GENERAL SCIENCE *Short Answer* Arrange the following 3 choices in INCREASING order of distance: 1 mile; 2 kilometers; 1,600 yards

ANSWER: 1,600 YARDS; 1 MILE; 2 KILOMETERS

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### TOSS-UP

6) LIFE SCIENCE *Short Answer* What is the most common term used for the biological process of converting atmospheric nitrogen into a form readily available for use in organisms?

ANSWER: NITROGEN FIXATION (ACCEPT: FIXATION)

### BONUS

6) LIFE SCIENCE *Multiple Choice* Which of the following groups of organisms is most commonly associated with the ability to fix nitrogen:

- W) plants
- X) animals
- Y) plants and animals
- Z) bacteria

ANSWER: Z) BACTERIA

### TOSS-UP

7) PHYSICAL SCIENCE *Multiple Choice* Which of the following is the inverse of electrical resistance:

- W) voltage
- X) conductivity
- Y) amperage
- Z) ohms

ANSWER: X) CONDUCTIVITY

### BONUS

7) PHYSICAL SCIENCE *Multiple Choice* Which of the following is the current carrier in a typical electrical conductor:

- W) free protons
- X) mobile electrons
- Y) stable atoms
- Z) hydrogen ions

ANSWER: X) MOBILE ELECTRONS

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### TOSS-UP

8) EARTH SCIENCE *Short Answer* Which 2 of the following 4 choices represent the suspended load of a river that gives a slow-moving river a cloudy appearance: gravel; clay; silt; sand

ANSWER: CLAY; SILT

### BONUS

8) EARTH SCIENCE *Multiple Choice* The average depth of the ocean basin floor is:

- W) 1,000 to 2,000 meters
- X) 2,000 to 4,000 meters
- Y) 4,000 to 6,000 meters
- Z) 6,000 to 10,000 meters

ANSWER: Y) 4,000 TO 6,000 METERS

### TOSS-UP

9) MATH *Short Answer* Solve the formula,  $I = prt$ , for  $r$ :

ANSWER:  $r = \frac{I}{pt}$  (ACCEPT:  $\frac{I}{pt}$ )

### BONUS

9) MATH *Short Answer* Multiply the following 3 fractions and give your answer as a proper fraction in simplest terms:  $\frac{3}{10} \times \frac{5}{7} \times \frac{1}{2}$

ANSWER:  $\frac{3}{28}$

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### TOSS-UP

10) GENERAL SCIENCE *Short Answer* Name all of the following 4 choices that are NOT SI units: meter; kilogram; degree Celsius; mole

ANSWER: DEGREE CELSIUS

### BONUS

10) GENERAL SCIENCE *Short Answer* Convert 5 meters per second to kilometers per hour:

ANSWER: 18

### TOSS-UP

11) LIFE SCIENCE *Multiple Choice* Which of the following is a lipid:

- W) lipase
- X) myoglobin
- Y) trypsin
- Z) corn oil

ANSWER: Z) CORN OIL

### BONUS

11) LIFE SCIENCE *Multiple Choice* Which of the following organisms contains the most chitin (read as: KYE-tin) by percent of body weight:

- W) leopard
- X) ant
- Y) squid
- Z) whale

ANSWER: X) ANT

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### TOSS-UP

12) PHYSICAL SCIENCE *Multiple Choice* Nitrogen, sulfur, and selenium are all:

- W) metals
- X) nonmetals
- Y) metalloids
- Z) noble gases

ANSWER: X) NONMETALS

### BONUS

12) PHYSICAL SCIENCE *Short Answer* Name all of the following 3 substances that are allotropes or different chemical forms of carbon: diamond; graphite; topaz

ANSWER: DIAMOND; GRAPHITE

### TOSS-UP

13) EARTH SCIENCE *Multiple Choice* Which of the following is a volcanic rock that is so lightweight that it can sometimes float on water:

- W) obsidian
- X) pitchstone
- Y) pumice
- Z) basalt

ANSWER: Y) PUMICE

### BONUS

13) EARTH SCIENCE *Short Answer* What 4 planets of our solar system have the highest mean density?

ANSWER: MERCURY; VENUS; EARTH; MARS (in any order)

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### TOSS-UP

14) MATH *Multiple Choice* Which of the following best describes two angles that share a common side and a common vertex and do not overlap:

- W) adjacent
- X) parallel
- Y) alternate
- Z) vertical

ANSWER: W) ADJACENT

### BONUS

14) MATH *Short Answer* Subtract the following 2 polynomials and simplify:  
 $(6x^2 - 7x + 13) - (-x^2 + 4x - 3)$

ANSWER:  $7x^2 - 11x + 16$

### TOSS-UP

15) GENERAL SCIENCE *Short Answer* What is the common name for the organic solvent which is the main ingredient in nail polish remover?

ANSWER: ACETONE

### BONUS

15) GENERAL SCIENCE *Short Answer* What element makes up about 24% of the Sun's mass?

ANSWER: HELIUM

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### TOSS-UP

16) LIFE SCIENCE *Short Answer* What parts of a flower make up the corolla?

ANSWER: PETALS

### BONUS

16) LIFE SCIENCE *Short Answer* Name all of the following 4 plants that have male and female flowers on the same plant: apple tree; tomato; maple tree; pumpkin

ANSWER: ALL

### TOSS-UP

17) PHYSICAL SCIENCE *Short Answer* How many carbons are there in an ethanol molecule?

ANSWER: 2

### BONUS

17) PHYSICAL SCIENCE *Multiple Choice* Which of the following is LEAST accurate regarding most solids:

- W) particles in a solid vibrate around fixed positions
- X) particles in a solid have no kinetic energy
- Y) most solids are crystalline
- Z) solids have definite melting points in their pure state

ANSWER: X) PARTICLES IN A SOLID HAVE NO KINETIC ENERGY

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### TOSS-UP

18) EARTH SCIENCE *Multiple Choice* Which of the following volcanic landforms is characterized by relatively quiet eruptions with little or no pyroclastic flows:

- W) stratovolcano
- X) cinder cone
- Y) shield
- Z) caldera

ANSWER: Y) SHIELD

### BONUS

18) EARTH SCIENCE *Multiple Choice* Mudstone, or mudrock, is which of the following:

- W) fine-grained sedimentary rock
- X) coarse-grained sedimentary rock
- Y) fine-grained metamorphic rock
- Z) coarse-grained metamorphic rock

ANSWER: W) FINE-GRAINED SEDIMENTARY ROCK

### TOSS-UP

19) MATH *Short Answer* If an ordered pair has an  $x$ -coordinate of zero, its graph lies on what part of the coordinate plane?

ANSWER: Y-AXIS (ACCEPT: VERTICAL AXIS)

### BONUS

19) MATH *Short Answer* Name all of the following 4 fractions that are equivalent to  $\frac{2}{3}$ :

$\frac{5}{9}$ ;  $\frac{16}{24}$ ;  $\frac{36}{54}$ ;  $-\frac{4}{6}$

ANSWER:  $\frac{16}{24}$ ;  $\frac{36}{54}$

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### TOSS-UP

20) GENERAL SCIENCE *Short Answer* In the United States, what crop is primarily used for ethanol fuel production?

ANSWER: CORN (ACCEPT: MAIZE)

### BONUS

20) GENERAL SCIENCE *Short Answer* Name whether the following 3 substances are primarily derived from plants or animals, respectively: coal; cotton; lard

ANSWER: COAL = PLANT; COTTON = PLANT; LARD = ANIMAL

**TOSS-UP**

21) LIFE SCIENCE *Short Answer* How many chambers does the heart of a shark have?

ANSWER: 2

**BONUS**

21) LIFE SCIENCE *Short Answer* Name all of the following 4 groups of organisms in which mitosis occurs: birds; reptiles; mollusks; bacteria

ANSWER: BIRDS; REPTILES; MOLLUSKS (ACCEPT: ALL BUT BACTERIA)

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**TOSS-UP**

22) PHYSICAL SCIENCE *Short Answer* What is the density, in grams per cubic centimeter, of a sample of plastic that floats with 45% of its volume submerged in pure water?

ANSWER: 0.45

**BONUS**

22) PHYSICAL SCIENCE *Short Answer* Ignoring friction, what is the acceleration, in meters per second squared, when 1,000 newtons of force are applied to move a 200-kilogram crate across a level floor?

ANSWER: 5

(Solution:  $A = F/M$ ;  $A = 1000/200$ ;  $A = 5 \text{ m/sec}^2$ )

### TOSS-UP

23) EARTH SCIENCE *Multiple Choice* Marble is a metamorphic rock primarily composed of:

- W) quartz
- X) granite
- Y) dolomite
- Z) calcite

ANSWER: Z) CALCITE

### BONUS

23) EARTH SCIENCE *Short Answer* What unstable substance does the stratosphere contain that functions to protect life on Earth?

ANSWER: OZONE (ACCEPT: OZONE LAYER or O<sub>3</sub>)

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### TOSS-UP

24) MATH *Short Answer* If 2 coplanar parallel lines are intersected by a transversal line, what is the sum of all angles formed?

ANSWER: 720

### BONUS

24) MATH *Short Answer* Malcolm drove his car a distance of 2 miles in a time of 2 minutes 30 seconds. Find his average speed, in miles per hour:

ANSWER: 48

### TOSS-UP

25) GENERAL SCIENCE *Short Answer* What is the name for the plastic-ware consisting of two overlapping round plastic or glass dishes used by microbiologists in which to grow bacteria?

ANSWER: PETRI DISH (ACCEPT: PETRI)

### BONUS

25) GENERAL SCIENCE *Multiple Choice* Which of the following is typically used by a microbiologist for growing bacterial cultures in petri dishes:

- W) autoclave
- X) incubator
- Y) laminar flow hood
- Z) fume hood

ANSWER: X) INCUBATOR