

## ROUND 1A

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### TOSS-UP

1) Life Science – *Multiple Choice* In the human body, the gallbladder is in immediate proximity to what organ?

- W) Liver
- X) Spleen
- Y) Pancreas
- Z) Thymus [*thigh-mus*]

ANSWER: W) LIVER

### BONUS

1) Life Science – *Short Answer* Flowering plants are grouped into what 2 classes named after their number of seed leaves?

ANSWER: MONOCOTS AND DICOTS (ACCEPT: MONOCOTYLEDONS AND DICOTYLEDONS )

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### TOSS-UP

2) Earth and Space – *Multiple Choice* Most volcanic rocks are porous due to:

- W) Erosion
- X) Marine organisms
- Y) Rapid cooling
- Z) Gases trapped inside lava

ANSWER: Z) GASES TRAPPED INSIDE LAVA

### BONUS

2) Earth and Space – *Multiple Choice* What impurity found in coal contributes most significantly to acid rain?

- W) Sulfur
- X) Nitrogen
- Y) Carbon
- Z) Chlorine

ANSWER: W) SULFUR

### TOSS-UP

3) General Science – *Multiple Choice* Which of the following is not considered a piece of laboratory safety equipment?

- W) Goggles
- X) Fume hood
- Y) Eye wash station
- Z) Bunsen burner

ANSWER: Z) BUNSEN BURNER

### BONUS

3) General Science – *Multiple Choice* What organ, located in the ventral cavity, is identified by its four lobes?

- W) Right lung
- X) Left lung
- Y) Liver
- Z) Kidneys

ANSWER: Y) LIVER

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### TOSS-UP

4) Math – *Multiple Choice* A right triangle has 1 angle that measures 27 degrees. In degrees, which of the following could be another angle of this triangle?

- W) 63
- X) 73
- Y) 123
- Z) 153

ANSWER: W) 63

### BONUS

4) Math – *Short Answer* Solve the following equation for x: 8 to the 6 - x power = 4 to the x - 1 power?

ANSWER: 4

### TOSS-UP

5) Physical Science – *Multiple Choice* The strength of the gravitational force between the earth and an airplane flying above its surface is NOT dependent on which of the following?

- W) Mass of the plane
- X) Mass of the earth
- Y) Velocity of the plane
- Z) Radius of the earth

ANSWER: Y) VELOCITY OF THE PLANE

### BONUS

5) Physical Science – *Multiple Choice* X-rays are composed of beams of what particles?

- W) Positrons
- X) Protons
- Y) Electrons
- Z) Photons

ANSWER: Z) PHOTONS



### TOSS-UP

6) Energy – *Short Answer* What is the term used to describe the medium in nuclear reactors that is used to reduce the speed of fast neutrons?

ANSWER: MODERATOR

### BONUS

6) Energy – *Short Answer* What is the term that refers to the minimum amount of Uranium-235 necessary to produce a self-sustaining nucleation fission reaction?

ANSWER: CRITICAL MASS

### TOSS-UP

7) Earth and Space – *Short Answer* By what process does fallen precipitation trickle into the ground and become part of the groundwater?

ANSWER: INFILTRATION

### BONUS

7) Earth and Space – *Multiple Choice* An eclipse of the moon occurs when:

- W) The moon passes directly between the Earth and the sun
- X) The Earth passes directly between the sun and the moon
- Y) The moon's dark side faces the Earth
- Z) The sun passes directly between the Earth and the moon

ANSWER: X) THE EARTH PASSES DIRECTLY BETWEEN THE SUN AND THE MOON



### TOSS-UP

8) General Science – *Short Answer* What chemical compound makes up the genetic material found inside of the nucleus?

ANSWER: DEOXYRIBONUCLEIC ACID (ACCEPT: DNA)

### BONUS

8) General Science – *Short Answer* To the nearest whole number, eleven pounds is approximately equal to how many kilograms?

ANSWER: 5

### TOSS-UP

9) Life Science – *Short Answer* What cells consist of cell bodies, dendrites, and axons?

ANSWER: NEURONS (ACCEPT: NERVE CELLS)

### BONUS

9) Life Science – *Multiple Choice* Which of the following has the steps of mitosis placed in the correct order?

- W) Telophase, prophase, anaphase, metaphase
- X) Prophase, metaphase, anaphase, telophase
- Y) Metaphase, telophase, prophase, anaphase
- Z) Anaphase, metaphase, prophase, telophase

ANSWER: X) PROPHASE, METAPHASE, ANAPHASE, TELOPHASE

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### TOSS-UP

10) Math – *Short Answer* What is the value of  $23 + \text{negative } s$  when  $s = -17$ ?

ANSWER: 40

### BONUS

10) Math – *Short Answer* Sarah left home at 8:00 a.m. and arrived at 11:45 a.m. If the distance she traveled is 225 miles, what was her average speed, in miles per hour, during the trip?

ANSWER: 60

### TOSS-UP

11) Energy – *Multiple Choice* Which of the following inventions is Alessandro Volta credited with?

- W) Alternating current
- X) Incandescent lightbulb
- Y) Battery
- Z) Radio wave generator

ANSWER: Y) BATTERY

### BONUS

11) Energy – *Short Answer* What type of chemical reaction is used in car engines and involves combining hydrocarbons and oxygen?

ANSWER: COMBUSTION



### TOSS-UP

12) Physical Science – *Short Answer* What is the smallest particle that retains the chemical properties of an element?

ANSWER: ATOM

### BONUS

12) Physical Science – *Short Answer* At what point on a pressure-volume diagram are liquid and gas no longer distinct?

ANSWER: CRITICAL POINT

### TOSS-UP

13) Life Science – *Multiple Choice* Which of the following organisms has spines?

- W) Conch
- X) Jellyfish
- Y) Limpet
- Z) Sea Urchin

ANSWER: Z) SEA URCHIN

### BONUS

13) Life Science – *Short Answer* What term is used to describe rings of muscle that usually control entry and exit from a body compartment?

ANSWER: SPHINCTER



### TOSS-UP

14) Math – *Short Answer* What is the perimeter of a right triangle with legs of length 3 and 4?

ANSWER: 12

### BONUS

14) Math – *Short Answer* Given  $f(x) = x - 4$  and  $g(x) = 1$  over open parenthesis  $x + 5$  close parenthesis, calculate  $g$  of  $f$  of 2.

ANSWER: 1/3

### TOSS-UP

15) Physical Science – *Short Answer* What term describes the bending of a wave as it moves between two mediums?

ANSWER: REFRACTION

### BONUS

15) Physical Science – *Multiple Choice* Sodium becomes positively charged when it combines with chlorine because sodium:

- W) Loses an electron
- X) Gains an electron
- Y) Forms a covalent bond
- Z) Has more electrons than protons

ANSWER: W) LOSES AN ELECTRON



### TOSS-UP

16) General Science – *Short Answer* The eyeball rests in a socket framed primarily by which cheekbone?

ANSWER: ZYGOMATIC

### BONUS

16) General Science – *Multiple Choice* How many significant figures are in the number 0.000320?

- W) 2
- X) 3
- Y) 4
- Z) 5

ANSWER: X) 3



### TOSS-UP

17) Earth and Space – *Multiple Choice* What era is also known as the Age of Mammals?

- W) Mesozoic
- X) Paleozoic
- Y) Cenozoic [*cen-uh-zoh-ik*]
- Z) Proterozoic

ANSWER: Y) CENOZOIC

### BONUS

17) Earth and Space – *Multiple Choice* Calving is the process that forms which of the following?

- W) Icebergs
- X) Lakes
- Y) Faults
- Z) Volcanoes

ANSWER: W) ICEBERGS



### TOSS-UP

18) Energy – *Short Answer* To the nearest ten percent, what portion of the electricity produced in the United States is generated through nuclear power?

ANSWER: 20

### BONUS

18) Energy – *Multiple Choice* Gasoline is mostly composed of which of the following?

- W) Alcohols
- X) Hydrocarbons
- Y) Aromatics
- Z) Oxidants

ANSWER: X) HYDROCARBONS

### TOSS-UP

19) Earth and Space – *Short Answer* What is the study of the atmosphere and the weather called?

ANSWER: METEOROLOGY

### BONUS

19) Earth and Space – *Short Answer* Eventually, a meander will cut off due to erosion and create a lake. What are these lakes called?

ANSWER: OXBOW LAKES



### TOSS-UP

20) General Science – *Short Answer* Healthy humans have many bacteria living on or in them. To the nearest whole numbers, what is the ratio of human to bacterial cells in most humans?

Answer: 1 HUMAN CELL TO 10 BACTERIAL CELLS (ACCEPT: 1:10)

### BONUS

20) General Science – *Multiple Choice* Theodor [*Tee-o-door*] Schwann and Matthias Schleiden [*schli-den*] are known for:

- W) Applying the concept of cells to plants and animals
- X) Coining the term "cell" from the structure of cork
- Y) Applying the concept of fibers and vessels to living things
- Z) Identifying the double helix of DNA

ANSWER: W) APPLYING THE CONCEPT OF CELLS TO PLANTS AND ANIMALS

### TOSS-UP

21) Life Science – *Short Answer* What is the name of the fourth and final stomach chamber in ruminants and is the location of protein digestion?

ANSWER: ABOMASUM

### BONUS

21) Life Science – *Short Answer* What higher plant cell organelle is responsible for using sunlight to convert carbon dioxide and water into sugar and oxygen?

ANSWER: CHLOROPLAST

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### TOSS-UP

22) Math – *Multiple Choice* Abby reads 10 pages of a 150 page book on Monday. Each subsequent day, she plans to read twice as many pages than she did the previous day. On what day will she finish the book?

- W) Tuesday
- X) Thursday
- Y) Friday
- Z) Saturday

ANSWER: X) THURSDAY

### BONUS

22) Math – *Short Answer* Solve the following equation for  $x$ :  
open parenthesis  $2x - 9$  close parenthesis squared = 81.

ANSWER:  $x = 0$  or  $x = 9$  (MUST GIVE BOTH ANSWERS)

### **TOSS-UP**

23) Physical Science – *Short Answer* What happens to the pH of an acidic solution as pure water is added?

ANSWER: pH INCREASES

### **BONUS**

23) Physical Science – *Short Answer* A rollercoaster car has a mass of 200 kilograms and a kinetic energy of 22.5 kilojoules. What is its velocity, in meters per second?

ANSWER: 15