

### DOUBLE ELIMINATION ROUND 3

#### TOSS-UP

1) GENERAL SCIENCE *Multiple Choice* Which of the following types of reactions releases the most energy per kilogram of fuel?

- W) Chemical
- X) Nuclear
- Y) Mechanical
- Z) Physical

ANSWER: X) NUCLEAR

#### BONUS

1) GENERAL SCIENCE *Short Answer* How many newtons does one kilogram of water weigh at the surface of the Earth?

ANSWER: 9.8 (ACCEPT: 10)

---

#### TOSS-UP

2) EARTH SCIENCE *Multiple Choice* Which of the following is the hardest coal and gives off a great amount of heat when it burns:

- W) anthracite
- X) bituminous
- Y) subbituminous
- Z) lignite

ANSWER: W) ANTHRACITE

#### BONUS

2) EARTH SCIENCE *Short Answer* Order the following 3 regions of the ocean floor from the one with the steepest gradient to the least: abyssal plain; continental slope; continental rise

ANSWER: CONTINENTAL SLOPE; CONTINENTAL RISE; ABYSSAL PLAIN

**TOSS-UP**

3) MATHEMATICS *Short Answer* What is the square root of 169?

ANSWER: 13

**BONUS**

3) MATHEMATICS *Short Answer* What is the largest odd integer which is both less than 100 and evenly divisible by 7?

ANSWER: 91

---

**TOSS-UP**

4) LIFE SCIENCE *Multiple Choice* What organism acts as the vector of malaria in humans?

- W) The *Anopheles* mosquito
- X) The Tsetse fly
- Y) The Kissing bug
- Z) The flea

ANSWER: W) THE ANOPHELES MOSQUITO

**BONUS**

4) LIFE SCIENCE *Short Answer* What organ of the human body is primarily responsible for eliminating abnormal red blood cells from the circulation and then recycling iron to the bone marrow ?

ANSWER: SPLEEN

### TOSS-UP

5) PHYSICAL SCIENCE *Multiple Choice* Who was the first scientist to be awarded two Nobel Prizes for science and did extensive research on radioactivity?

- W) Niels Bohr
- X) Albert Michelson
- Y) Hendrik Lorentz
- Z) Marie Curie

ANSWER: Z) MARIE CURIE

### BONUS

5) PHYSICAL SCIENCE *Short Answer* Ignoring friction, what acceleration in meters per second squared is produced by a force of 20 newtons applied to a 10 kilogram bicycle?

ANSWER: 2

---

### TOSS-UP

6) GENERAL SCIENCE *Multiple Choice* How many miles are there in an Astronomical Unit?

- W) About 5.86 trillion miles
- X) About 273 million miles
- Y) About 93 million miles
- Z) About 240 thousand miles

Answer: Y) ABOUT 93 MILLION MILES

### BONUS

6) GENERAL SCIENCE *Multiple Choice* When the Moon appears through the night as a thin crescent, the Sun's light:

- W) is being blocked by the earth
- X) still illuminates about half the surface of the moon
- Y) is only hitting the crescent region
- Z) only shines during the day

ANSWER: X) STILL ILLUMINATES ABOUT HALF THE SURFACE OF THE MOON

**TOSS-UP**

7) EARTH SCIENCE *Multiple Choice* Pluto is the farthest planet from the sun during most, but not all, of its 249-year orbit. For about 20 years, what planet is actually the farthest from the Sun?

- W) Neptune
- X) Uranus
- Y) Saturn
- Z) Jupiter

ANSWER: W) NEPTUNE

**BONUS**

7) EARTH SCIENCE *Short Answer* The K-T boundary, which greatly supported the mass extinction of dinosaurs refers to the boundary between what two geological periods?

ANSWER: CRETACIOUS, TERTIARY

---

**TOSS-UP**

8) MATHEMATICS *Short Answer* The number 2002 is a palindrome because it is the same number read forward or backward. What is the next year that is a palindrome?

ANSWER: 2112

**BONUS**

8) MATHEMATICS *Short Answer* What is the least positive integer with exactly six factors?

ANSWER: 12

### TOSS-UP

9) LIFE SCIENCE. *Multiple Choice* Flowering plants called angiosperms are divided into two major groups, monocots and dicots, based primarily on what feature?

- W) Number of seed leaves
- X) Size and color of flower
- Y) Tolerance for heat and humidity
- Z) Ability to withstand herbicides

ANSWER: W) NUMBER OF SEED LEAVES

### BONUS

9) LIFE SCIENCE *Multiple Choice* What gland, located in the area beneath the sternum, is essential for a fully functional immune system?

- W) The pineal gland
- X) The hippocampus
- Y) The pituitary gland
- Z) The thymus

ANSWER: Z) THE THYMUS

---

### TOSS-UP

10) PHYSICAL SCIENCE *Multiple Choice* Which of the following is a mixture?

- W) Pure gold
- X) Distilled water
- Y) Carbon dioxide
- Z) Air

ANSWER: Z) AIR

### BONUS

10) PHYSICAL SCIENCE *Short Answer* In what phase of matter is the ionized substance inside a typical fluorescent light?

ANSWER: PLASMA

**TOSS-UP**

11) GENERAL SCIENCE *Short Answer* On the Kelvin temperature scale, give the whole number value that is the closest to absolute zero.

ANSWER: 0

**BONUS**

11) GENERAL SCIENCE *Short Answer* What metal recently replaced aluminum as the interconnect metal of choice on computer chips due to its low electrical resistance?

ANSWER: COPPER

---

**TOSS-UP**

12) EARTH SCIENCE *Multiple Choice* Maximum sunspot activity occurs at regular intervals of about how many years?

- W) 15-16 years
- X) 11-12 years
- Y) 5-6 years
- Z) 25-30 years

ANSWER: X) 11-12 YEARS

**BONUS**

12) EARTH SCIENCE *Short Answer* What is the name of the region of low pressure located around the equator?

ANSWER: THE DOLDRUMS

**TOSS-UP**

13) MATHEMATICS *Short Answer* What is the volume of a cube whose edge is 2 inches long?

ANSWER: 8 (ACCEPT: 8 CUBIC INCHES OR 8 INCHES CUBED)

**BONUS**

13) MATHEMATICS *Short Answer* A roller blade wheel has a diameter of 7 centimeters. How many centimeters, in terms of pi, has the wheel traveled after 8 revolutions? Answer in terms of  $\pi$ .

ANSWER:  $56\pi$

---

**TOSS-UP**

14) LIFE SCIENCE *Multiple Choice* Actin and myosin are proteins most directly associated with the function of which of the following tissues or systems of the human body?

- W) Adipose
- X) Nervous
- Y) Digestive
- Z) Muscle

ANSWER: Z) MUSCLE

**BONUS**

14) LIFE SCIENCE *Multiple Choice* Which of the following genetic mutations would cause the greatest change in the nucleotide sequence of a gene?

- W) addition of 3 bases
- X) deletion of 6 bases
- Y) addition of 1 base
- Z) deletion of 3 bases

ANSWER: Y) ADDITION OF 1 BASE

### TOSS-UP

15) PHYSICAL SCIENCE *Short Answer* Most televisions use a cathode ray tube to generate the picture on the screen. A cathode ray is made up of what subatomic particles?

ANSWER: ELECTRONS

### BONUS

15) PHYSICAL SCIENCE *Short Answer* Which subatomic particle is most directly responsible for the chemical properties of an element?

ANSWER: ELECTRONS (ACCEPT: VALENCE ELECTRONS)

---

### TOSS-UP

16) GENERAL SCIENCE *Multiple Choice* Stars appear to have different colors because they have different:

- W) distances
- X) ages
- Y) temperatures
- Z) names

ANSWER: Y) TEMPERATURES

### BONUS

16) GENERAL SCIENCE *Multiple Choice* Of the following 5 elements, which one is the least chemically reactive? Sodium, Oxygen, Francium, Boron, Xenon

ANSWER: XENON



**TOSS-UP**

17) EARTH SCIENCE *Multiple Choice* Tsunamis, when seen in the deep ocean far from land, typically are about how much in amplitude?

- W) 1 foot
- X) 20 feet
- Y) 50 feet
- Z) 100 feet

ANSWER: W) 1 FOOT

**BONUS**

17) EARTH SCIENCE *Short Answer* The contour interval for a topographic map is 150 meters. Starting at 150 meters and on uniform incline, what is the elevation 8 contour lines away?

ANSWER: 1350 METERS

---

**TOSS-UP**

18) MATHEMATICS *Short Answer* The sum of two whole numbers is 8 and their positive difference is 2. What is the product of these two numbers?

ANSWER: 15

**BONUS**

18) MATHEMATICS *Short Answer* Twelve pool balls numbered 1 to 12 are on the pool table. Kira noticed that when she separated the balls into two equal groups the sum of the balls was the same in each group. What was the common sum?

ANSWER: 39

### TOSS-UP

19) LIFE SCIENCE *Multiple Choice* The name of Dr. Joseph Lister is most often associated with what?

- W) First heart transplant
- X) Pioneering the development and use of vaccines
- Y) The eradication of Yellow Fever
- Z) Sterile surgical techniques

ANSWER: Z) STERILE SURGICAL TECHNIQUES

### BONUS

19) LIFE SCIENCE *Short Answer* What term do scientists use to describe how animals maintain a constant internal environment when the external world is changing?

ANSWER: HOMEOSTASIS (ACCEPT HOMEOSTATIC)

---

### TOSS-UP

20) PHYSICAL SCIENCE *Multiple Choice* What is the shape of the surface of the secondary mirror in a Newtonian telescope?

- W) Spherical
- X) Parabolic
- Y) Flat
- Z) Hyperbolic

ANSWER: Y) FLAT

### BONUS

20) PHYSICAL SCIENCE *Short Answer* As an atom's atomic mass increases, more of what type of particles are needed to maintain nuclear stability:

ANSWER: NEUTRONS

### TOSS-UP

21) GENERAL SCIENCE *Short Answer* What is the mineral that has tricked so many people into thinking it was the precious metal gold that its common name is “fool’s gold?”

ANSWER: IRON PYRITE (ACCEPT: PYRITE)

### BONUS

21) GENERAL SCIENCE *Multiple Choice* What name did ancient Greek astronomers give the heavenly bodies that seemed to wander in their paths among the stars:

- W) sun spots
- X) asteroid belts
- Y) constellations
- Z) planets

ANSWER: Z) PLANETS

---

### TOSS-UP

22) EARTH SCIENCE *Short Answer* California has a very long strike-slip fault that has been associated with several damaging earthquakes during historical times. What is the name given to this very long zone of crustal confrontation?

ANSWER: THE SAN ANDREAS FAULT (ACCEPT SAN ANDREAS)

### BONUS

22) EARTH SCIENCE *Short Answer* Name the two crustal plates on either side of the San Andreas Fault in California:

ANSWER: PACIFIC PLATE AND NORTH AMERICAN PLATE (in any order)

**TOSS-UP**

23) MATHEMATICS *Multiple Choice* The number 0.13 is written with a bar drawn over the last two digits. This means that:

- W) the number terminates at 3
- X) the pair of digits 13 repeats forever
- Y) the number 3 repeats forever
- Z) the number is negative

ANSWER: X) THE PAIR OF DIGITS 13 REPEATS FOREVER

**BONUS**

23) MATHEMATICS *Short Answer* How many positive integers less than 100 are perfect squares?

ANSWER: 9

---

**TOSS-UP**

24) LIFE SCIENCE. *Short Answer* What is the primary secretion of the lacrimal glands?

ANSWER: TEARS

**BONUS**

24) BIOLOGY *Short Answer* Rods and cones are located in what tissue layer of the human eye?

ANSWER: RETINA

### TOSS-UP

25) PHYSICAL SCIENCE *Short Answer* What radioactive element, formed from the decay of U-238, sometimes seeps and collects in well-insulated buildings until it becomes hazardous to human inhabitants and poses the greatest radiation risk to humans in the U.S.?

ANSWER: RADON

### BONUS

25) PHYSICAL SCIENCE *Multiple Choice* Which of the following solutions will conduct electricity the best?

- W) sugar and distilled water
- X) alcohol and distilled water
- Y) sodium chloride and distilled water
- Z) moth balls and alcohol

ANSWER: Y) SODIUM CHLORIDE AND DISTILLED WATER