

## SINGLE ELIMINATION ROUND 1

### TOSS-UP

1) **MATH** *Multiple Choice* For numbers  $\leq 10$  (read as: less than or equal to 10), and not including the number 1, how many are prime numbers?

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

ANSWER: X) 4 (Solution: primes are 2, 3, 5, 7)

### BONUS

1) **MATH** *Short Answer* Factor the expression:  $x^2 + 3x - 10$

ANSWER:  $(x + 5)(x - 2)$

### TOSS-UP

2) **LIFE SCIENCE** *Multiple Choice* A summary reaction for photosynthesis is:

- W)  $\text{CO}_2 + \text{O}_2 + \text{H}_2\text{O}$  and light yields carbohydrate +  $\text{O}_2$
- X)  $\text{CO}_2 + \text{H}_2\text{O}$  and light yields carbohydrate +  $\text{O}_2$
- Y)  $\text{CO}_2 + \text{H}_2\text{O}$  and light yields carbohydrate +  $\text{H}_2\text{O}$
- Z)  $\text{CO}_2 + \text{O}_2 + \text{H}_2\text{O}$  and light yields carbohydrate +  $\text{H}_2\text{O}$

ANSWER: X)  $\text{CO}_2 + \text{H}_2\text{O}$  AND LIGHT YIELDS CARBOHYDRATE +  $\text{O}_2$

### BONUS

2) **LIFE SCIENCE** *Multiple Choice* It is generally believed that most of the oxygen in the air today came from:

- W) oxidation of carbon molecules containing oxygen
- X) release of oxygen from volcanic vents
- Y) photosynthesis
- Z) forest fires

ANSWER: Y) PHOTOSYNTHESIS

**TOSS-UP**

3) **LIFE SCIENCE** *Multiple Choice* Osmosis is:

- W) the movement of water through a permeable membrane
- X) the movement of salts through a semi-permeable membrane
- Y) the movement of water through a semi-permeable membrane
- Z) the pressure exerted by water through a semi-permeable membrane

ANSWER: Y) THE MOVEMENT OF WATER THROUGH A SEMI-PERMEABLE MEMBRANE

**BONUS**

3) **LIFE SCIENCE** *Multiple Choice* Which of the following is most accurate about the pasteurization of milk:

- W) it makes milk taste better
- X) it kills all bacteria by sterilizing the milk
- Y) it lowers the milk's pH
- Z) it reduces the population of bacteria by heating but not boiling the milk

ANSWER: Z) IT REDUCES THE POPULATION OF BACTERIA BY HEATING BUT NOT BOILING THE MILK

**TOSS-UP**

4) **EARTH SCIENCE** *Multiple Choice* The hard rock under the topsoil in eastern Washington state was laid down over millions of years by volcanic eruptions. This rock is:

- W) limestone
- X) basalt
- Y) lava
- Z) granite

ANSWER: X) BASALT

**BONUS**

4) **EARTH SCIENCE** *Short Answer* Wind speed is measured by what instrument?

ANSWER: ANEMOMETER

### TOSS-UP

5) **GENERAL SCIENCE** *Multiple Choice* Doubling a musical note's amplitude:

- W) doubles its frequency
- X) doubles its wavelength
- Y) increases its loudness
- Z) doubles its speed

ANSWER: Y) INCREASES ITS LOUDNESS

### BONUS

5) **GENERAL SCIENCE** *Short Answer* Physicists believe there are four fundamental forces of nature. Name any two of them.

ANSWER: GRAVITATIONAL, ELECTROMAGNETIC, STRONG, WEAK (ANY OF THESE FOUR IN ANY ORDER)

### TOSS-UP

6) **PHYSICAL SCIENCE** *Short Answer* Spanky swings a ball on the end of a string and maintains it in uniform circular motion, what is the most accurate term for the force exerted on the rock through the string?

ANSWER: CENTRIPETAL

### BONUS

6) **PHYSICAL SCIENCE** *Multiple Choice* The density of an object is a property that depends on:

- W) the total weight of object
- X) the total volume of the object
- Y) the liquid the object is suspended in
- Z) none of the above

ANSWER: Z) NONE OF THE ABOVE

### TOSS-UP

\*7) **PHYSICAL SCIENCE** *Multiple Choice* Amplitude modulation is typically associated with what common form of communication:

- W) television transmission
- X) radio transmission
- Y) short wave transmissions
- Z) laser transmissions

ANSWER: X) RADIO TRANSMISSION

### BONUS

7) **PHYSICAL SCIENCE** *Multiple Choice* Which of the following elements does not occur naturally in nature:

- W) uranium
- X) technetium (PRONOUNCED: TECH-net-ee-um)
- Y) boron
- Z) radon

ANSWER: X) TECHNETIUM

### TOSS-UP

8) **MATH** *Multiple Choice* Which of the following is NOT true:

- W) all natural numbers are whole numbers
- X) all whole numbers are integers
- Y) all integers are rational numbers
- Z) all numbers can be both a rational number and an irrational number

ANSWER: Z) ALL NUMBERS CAN BE BOTH A RATIONAL NUMBER AND AN IRRATIONAL NUMBER

### BONUS

8) **MATH** *Short Answer* Factor the following equation:  $x^2 - 6x + 5 = 0$

ANSWER:  $(x - 5)(x - 1) = 0$

### TOSS-UP

9) **EARTH SCIENCE** *Multiple Choice* As more fossil fuels are burned to produce energy, the greenhouse effect will continue to cause the temperature of the earth's atmosphere to increase. The substance primarily responsible for the greenhouse effect is:

- W) ozone
- X) carbon dioxide
- Y) fluorocarbons
- Z) oxygen

ANSWER: X) CARBON DIOXIDE

### BONUS

9) **EARTH SCIENCE** *Multiple Choice* Which of the following is sometimes called volcanic glass because of its shiny appearance:

- W) obsidian
- X) granite
- Y) quartz
- Z) diorite

ANSWER: W) OBSIDIAN

### TOSS-UP

10) **GENERAL SCIENCE** *Multiple Choice* Which of the following is the most common cause of deaths in American women between the ages of 20 and 40?

- W) AIDS
- X) breast cancer
- Y) colon cancer
- Z) heart attacks

ANSWER: X) BREAST CANCER

### BONUS

10) **GENERAL SCIENCE** *Short Answer* Order the following from the SMALLEST unit of distance to the LARGEST: mile, rod, feet, kilometer.

ANSWER: FOOT, ROD, KILOMETER, MILE

### TOSS-UP

11) **PHYSICAL SCIENCE** *Short Answer* For two objects separated by a distance  $d$ , if the mass of one of the objects increases by two times, by what factor will the gravitational attraction between them increase?

ANSWER: TWO (ACCEPT 2 TIMES)

### BONUS

11) **PHYSICAL SCIENCE** *Multiple Choice* Which of the following elements is found in Period 2 and Group 4A of the Periodic Table:

- W) sulfur
- X) carbon
- Y) nitrogen
- Z) oxygen

ANSWER: X) CARBON

### TOSS-UP

12) **GENERAL SCIENCE** *Multiple Choice* Tomorrow's weather forecast report for Venus would be:

- W) snow
- X) cold & clear
- Y) hot & humid with clear skies
- Z) overcast & hot

ANSWER: Z) OVERCAST & HOT

### BONUS

10) **GENERAL SCIENCE** *Multiple Choice* What part of the cotton plant produces what is used to make cotton fabric.

- W) flowers or seed pods
- X) fibers in the stems
- Y) root hairs
- Z) fibers in the leaves

ANSWER: W) FLOWERS OR SEED PODS

(Solution: The flowers of the cotton plant develop into seed pods and the seeds inside the pods are surrounded with an abundance of fine white hairs which are used to produce long strands or filaments of cotton thread.)

**TOSS-UP**

13) **MATH** *Short Answer* In standard form, give the product of  $(a + b)^2$ :

ANSWER:  $a^2 + 2ab + b^2$

**BONUS**

13) **MATH** *Short Answer* Solve the following equation:  $2x + 4 = 6 + 2x$

ANSWER: NO SOLUTION (ACCEPT: FALSE, CONTRADICTION, DEFECTIVE EQUATION, ETC.)

**TOSS-UP**

14) **LIFE SCIENCE** *Multiple Choice* In bean and corn seeds, the food supply that is used by the seed to germinate and grow is in the:

- W) cotyledon (PRONOUNCED: KOT-ill-ee-don)
- X) root tip
- Y) abscission zone
- Z) petiole

ANSWER: W) COTYLEDON

**BONUS**

14) **LIFE SCIENCE** *Multiple Choice* Which of the following infectious diseases cannot be cured with current antibiotics:

- W) strep throat
- X) toxic shock syndrome
- Y) scarlet fever
- Z) influenza

ANSWER: Z) INFLUENZA

### TOSS-UP

15) **LIFE SCIENCE** *Multiple Choice* The green pigment in plants that captures the energy of sunlight and initiates photosynthesis is called:

- W) chlorophyll
- X) anthocyanin
- Y) carotene
- Z) xanthophylls

ANSWER: W) CHLOROPHYLL

### BONUS

15) **LIFE SCIENCE** *Multiple Choice* Which of the following is an ectoparasite:

- W) tape worm
- X) malaria
- Y) pinworm
- Z) lice

ANSWER: Z) LICE

### TOSS-UP

16) **EARTH SCIENCE** *Short Answer* What is the name for the fossilized sap of ancient conifer trees that has become brittle and hard, transparent, and yellow to brown in color:

ANSWER: AMBER

### BONUS

16) **EARTH SCIENCE** *Multiple Choice* Which of the following minerals constitute approximately 60% of the Earth's crust:

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

ANSWER: W) FELDSPAR

**TOSS-UP**

17) **GENERAL SCIENCE** *Multiple Choice* In humans, fertilization of the egg occurs most typically in which of the following?

- W) ovary
- X) vagina
- Y) uterus
- Z) fallopian tube

ANSWER: Z) FALLOPIAN TUBE

**BONUS**

17) **GENERAL SCIENCE** *Multiple Choice* Which of the following is closest to the length of a U.S. five dollar bill?

- W) 6 cm
- X) 12 cm
- Y) 16 cm
- Z) 22 cm

ANSWER: Y) 16 CM

**TOSS-UP**

18) **GENERAL SCIENCE** *Short Answer* In a typical four cycle gasoline car engine, what are the most common names for the third stage or cycle of the engine if the first cycle is the intake?

ANSWER: IGNITION (ACCEPT: POWER)

**BONUS**

18) **GENERAL SCIENCE** *Short Answer* Order the following from the least used energy source to produce electricity in the U.S.A. to the most: hydroelectricity, oil, coal, nuclear

ANSWER: HYDROELECTRICITY, OIL, NUCLEAR, COAL

### TOSS-UP

\*19) **PHYSICAL SCIENCE** *Multiple Choice* A manual laborer moves 40 kilograms of flour 5 feet above the ground in 5 seconds. If she does the same task in twice the time it involves a different amount of what:

- W) power
- X) work
- Y) kinetic energy
- Z) potential energy

ANSWER: W) POWER

### BONUS

19) **PHYSICAL SCIENCE** *Short Answer* What is the chemical symbol for the toxic element that causes mental retardation and is medically referred to as Plumbism?

ANSWER: Pb

### TOSS-UP

20) **EARTH SCIENCE** *Multiple Choice* Which of the following is primarily involved in the movement of a glacier:

- W) running water
- X) ambient temperature
- Y) topology
- Z) gravity

ANSWER: Z) GRAVITY

### BONUS

20) **EARTH SCIENCE** *Multiple choice* The Saffir-Simpson Scale is used to classify intensities of:

- W) hurricanes
- X) tornadoes
- Y) earthquakes
- Z) volcanic eruptions

ANSWER: W) HURRICANES

### TOSS-UP

21) **MATH** *Multiple Choice* The equation,  $x = -4$ , is which of the following:

- W) a true statement
- X) a false statement
- Y) a conditional equation
- Z) an equivalent equation

ANSWER: Y) A CONDITIONAL EQUATION

### BONUS

21) **MATH** *Short Answer* Express the square root of 75 in its simplest radical form:

ANSWER:  $5\sqrt{3}$

### TOSS-UP

22) **PHYSICAL SCIENCE** *Short Answer* This person established the “one fluid theory” of electricity and performed some of the first investigations into electrical grounding and insulation:

ANSWER: BEN FRANKLIN

### BONUS

\*22) **PHYSICAL SCIENCE** *Multiple Choice* What is always unchanged in any chemical reaction as reactants form products:

- W) the number of molecules
- X) the kind and number of atoms
- Y) the temperature
- Z) the pressure

ANSWER: X) THE KIND AND NUMBER OF ATOMS

**TOSS-UP**

23) **EARTH SCIENCE** *Multiple Choice* A continental glacier is found in which of the following locations:

- W) The Swiss Alps
- X) The Canadian Rockies
- Y) Greenland
- Z) The Andes Mountains

ANSWER: Y) GREENLAND

**BONUS**

23) **EARTH SCIENCE** *Short Answer* The ability of mica to split into flat planar flakes resembling the leaves of a book is called what?

ANSWER: CLEAVAGE

**TOSS-UP**

24) **MATH** *Short Answer* What is the square root of  $\frac{1}{4}$ ?

ANSWER:  $\frac{1}{2}$

**BONUS**

24) **MATH** *Short Answer* Simplify the following algebraic expression:  $4x - 3(a - b)$

ANSWER:  $4x - 3a + 3b$

### TOSS-UP

25) LIFE SCIENCE *Multiple Choice* Which of the following is the hormone produced by the human body to control blood sugar and when not produced in sufficient amounts is the cause of some forms of diabetes:

- W) hemoglobin
- X) pituitary hormone
- Y) insulin
- Z) testosterone

ANSWER: Y) INSULIN

### BONUS

25) LIFE SCIENCE *Multiple Choice* The wing of a bird and the arm of a human are considered:

- W) congruent structures
- X) analogous structures
- Y) homologous structures
- Z) vestigial structures

ANSWER: Y) HOMOLOGOUS STRUCTURES