

SINGLE ELIMINATION ROUND 3

TOSS-UP

*1) **GENERAL SCIENCE** *Multiple Choice* Fungi are usually spread most effectively by:

- W) water born hyphae
- X) airborne spores
- Y) animal ingestion of spores
- Z) soil germination of seeds

ANSWER: X) AIRBORNE SPORES

BONUS

*1) **GENERAL SCIENCE** *Multiple Choice* When using a compound light microscope, which of the following is the proper procedure for focusing?

- W) begin with a low power objective and use only course focus when using the high power objective
- X) begin with a high power objective and use only fine focus when using the low power objective
- Y) begin with a low power objective and use only fine focus when using the high power objective
- Z) begin with a high power objective and use only course focus when using the low power objective

ANSWER: Y) BEGIN WITH A LOW POWER OBJECTIVE AND USE ONLY FINE FOCUS WHEN USING THE HIGH POWER OBJECTIVE

TOSS-UP

2) **MATH** *Short Answer* Factor the following quadratic equation: $x^2 + 6x + 9$

ANSWER: $(x + 3)(x + 3)$ or $(x + 3)^2$

BONUS

2) **MATH** *Short Answer* If you count from 1 to 100, how many 9's will you pass on the way?

ANSWER: 20

TOSS-UP

3) **MATH** *Multiple Choice* Which of the following is a binomial?

W) $\frac{x^2}{2}$

X) $x^2 + 5x - 2$

Y) π

Z) $x - 2$

ANSWER : Z) $x - 2$

BONUS

3) **MATH** *Short Answer* What are all the integral factors of the number 22?

ANSWER: 1, 2, 11, 22 (ACCEPT: + or - 1, 2, 11, 22)

TOSS-UP

4) **LIFE SCIENCE** *Multiple Choice* During photosynthesis, for every molecule of glucose that is made, how many molecules of carbon dioxide and water are consumed?

W) six carbon dioxide molecules and six water molecules

X) four carbon dioxide molecules and four water molecules

Y) twelve carbon dioxide molecules and twelve water molecules

Z) six carbon dioxide molecules and twelve water molecules

ANSWER: W) SIX CARBON DIOXIDE MOLECULES AND SIX WATER MOLECULES

BONUS

4) **LIFE SCIENCE** *Multiple Choice* Which of the following best describes antibodies:

W) a class of polysaccharides involved in the immune system

X) a group of proteins made by plasma cells in response to a foreign substance

Y) small bodies of insects that look like ants

Z) a class of genes produced by the immune system to fight disease

ANSWER: X) A GROUP OF PROTEINS MADE BY PLASMA CELLS IN RESPONSE TO A FOREIGN SUBSTANCE

TOSS-UP

5) **EARTH SCIENCE** *Multiple choice* If wind speeds in a storm are clocked in excess of 200 mph, this is most likely a measurement within a :

- W) typical thunder storm
- X) tornado
- Y) hurricane
- Z) microburst

ANSWER: X) TORNADO

BONUS

5) **EARTH SCIENCE** *Multiple Choice* S-waves produced by earthquakes, do not travel through the Earth's:

- W) crust
- X) mantle
- Y) outer core
- Z) lithosphere

ANSWER: Y) OUTER CORE

TOSS-UP

6) **PHYSICAL SCIENCE** *Multiple Choice* What causes skin to sunburn after prolonged exposure to sunlight?

- W) infrared light
- X) X-rays
- Y) ultraviolet light
- Z) cosmic rays

ANSWER: Y) ULTRAVIOLET LIGHT

BONUS

6) **PHYSICAL SCIENCE** *Short Answer* An automobile traveling at 100 kilometers per hour has how many more times the kinetic energy than the same vehicle traveling at 50 kilometers per hour?

ANSWER: 4 TIMES

TOSS-UP

*7) **PHYSICAL SCIENCE** *Multiple Choice* The melting of lead, the freezing of water, and the sublimation of dry ice, are all examples of which of the following:

- W) chemical reactions
- X) separation processes
- Y) condensation processes
- Z) physical changes

ANSWER: Z) PHYSICAL CHANGES

BONUS

*7) **PHYSICAL SCIENCE** *Short Answer* If a 90 kilogram object displaces 30 kilograms of water when immersed, what will its apparent weight be?

ANSWER: 60 KILOGRAMS (ACCEPT: 60 KG OR 60,000 GRAMS OR 600 NEWTONS)

TOSS-UP

*8) **GENERAL SCIENCE** *Multiple Choice* Which of the following temperatures in degrees Centigrade most likely corresponds to the hottest day on record anywhere in the USA:

- W) 26 degrees C
- X) 41 degrees C
- Y) 57 degrees C
- Z) 65 degrees C

ANSWER: Y) 57 DEGREES C

BONUS

*8) **GENERAL SCIENCE** *Multiple Choice* We know from solar eclipses that the Moon and the Sun appear in the sky to be:

- W) about the same diameter
- X) much different in size
- Y) in orbit around the Earth
- Z) moving on a collision course

ANSWER: W) ABOUT THE SAME DIAMETER

TOSS-UP

9) **LIFE SCIENCE** *Short Answer* The spines of cacti are a modification of what plant structure?

ANSWER: LEAF

BONUS

9) **LIFE SCIENCE** *Multiple Choice* Which of the following cells would typically be capable of the greatest amount of phagocytosis

- w) plasma cells
- X) lymphocytes
- Y) mast cells
- Z) macrophages

ANSWER: Z) MACROPHAGES

TOSS-UP

10) **MATH** *Multiple Choice* Which of the following is TRUE of the following equation:
 $3x + 9 = 9 + 3x$

- W) the equation is conditional
- X) the equation is an identity
- Y) it is an equation with no solution
- Z) the equation has an infinite number of solutions

ANSWER: X) THE EQUATION IS AN IDENTITY

BONUS

10) **MATH** *Short Answer* What 3 consecutive numbers add up to 39?

ANSWER: 12, 13, AND 14

TOSS-UP

11) **EARTH SCIENCE** *Multiple Choice* The San Andreas Fault in California is an example of what type of plate margin:

- W) divergent margin
- X) convergent margin
- Y) transform fault margin
- Z) subduction margin

ANSWER: Y) TRANSFORM FAULT MARGIN

BONUS

11) **EARTH SCIENCE** *Short Answer* Order the following minerals from the hardest to the softest: Corundum; Quartz; Fluorite

ANSWER: CORUNDUM; QUARTZ; FLUORITE

TOSS-UP

12) **PHYSICAL SCIENCE** *Multiple Choice* Which of the following is largely responsible for the characteristic bad odor of a rotten egg?

- W) sulfuric acid
- X) hydrogen sulfide
- Y) sodium chloride
- Z) nitrogen oxide

ANSWER: X) HYDROGEN SULFIDE

BONUS

*12) **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 distiller water
- Z) moth balls and alcohol

ANSWER: Y) SODIUM CHLORIDE AND DISTILLER WATER

TOSS-UP

13) **GENERAL SCIENCE** *Short Answer* If Todd weighs 88 pounds, rounded to the nearest whole number, how much does he weigh in kilograms?

ANSWER: 40

BONUS

*13) **GENERAL SCIENCE** *Multiple Choice* Which of the following U.S. year 2001 coins is closest in diameter to 2 cm?

- W) a dollar
- X) a quarter
- Y) a dime
- Z) a penny

ANSWER: Z) A PENNY

TOSS-UP

14) **EARTH SCIENCE** *Short Answer* How many times does the Moon appear as half-full during a single lunar cycle?

ANSWER: 2

BONUS

14) **EARTH SCIENCE** *Multiple Choice* Which of the following is true of the Hawaiian chain of islands:

- W) they show increasing age from the northwest to the southeast
- X) they are thought to be the result of the lithosphere moving over a hot spot
- Y) they represent what could happen when plates interact at a convergent boundary
- Z) all the islands have approximately the same age

ANSWER: X) THEY ARE THOUGHT TO BE THE RESULT OF THE LITHOSPHERE MOVING OVER A HOT SPOT

TOSS-UP

***15) PHYSICAL SCIENCE** *Multiple Choice* A figure skater who, while spinning in place, pulls her arms in to increase her rotational speed, is most closely exhibiting which of the following:

- W) conservation of angular momentum
- X) centrifugal force
- Y) satellite motion
- Z) centripetal acceleration

ANSWER: W) CONSERVATION OF ANGULAR MOMENTUM

BONUS

***15) PHYSICAL SCIENCE** *Multiple Choice* The centrifugal effect perceived by a person on a carousel is most accurately attributed to which of the following:

- W) friction
- X) a stationary frame of reference
- Y) constant velocity and accelerating angular momentum
- Z) inertia

ANSWER: Z) INERTIA

TOSS-UP

16) MATH *Short Answer* Add the following: $3\frac{1}{2} + 2\frac{1}{3} + 1\frac{1}{12} =$

ANSWER: $6\frac{11}{12}$

BONUS

16) MATH *Short Answer* What is the average speed, in miles per hour, of a person who travels 120 miles in 3 hours, 40 miles the next 3 hours, and 36 miles the following 2 hours?

ANSWER: 24.5 (ACCEPT: 24 – 25)

TOSS-UP

*17) **EARTH SCIENCE** *Short Answer* The red color of Navajo sand stone is primarily because of the presence of what element?

ANSWER: IRON

BONUS

17) **EARTH SCIENCE** *Multiple Choice* It is estimated that the temperature of the Earth's core is:

- W) as hot as the surface of the sun
- X) much hotter than the surface of the sun
- Y) much cooler than the surface of the sun
- Z) it cannot be estimated

ANSWER: W) AS HOT AS THE SURFACE OF THE SUN

TOSS-UP

*18) **EARTH SCIENCE** *Multiple Choice* If the full moon rises in Nebraska at about 9 p.m., which of the following will most likely be the approximate time it rises the next day?

- W) 7:30 p.m.
- X) 8:45 p.m.
- Y) 9:00 p.m.
- Z) 9:50 p.m.

ANSWER: Z) 9:50 P.M.

BONUS

18) **EARTH SCIENCE** *Short Answer* Name 2 places on earth where continental glaciers exist:

ANSWER: ANTARCTICA AND GREENLAND

TOSS-UP

19) **LIFE SCIENCE** *Multiple Choice* Which of the following is a monocot:

- W) *Acer rubrum*
- X) *Quercus rubra*
- Y) *Zea mays*
- Z) *Echinacea angustifolia*

ANSWER: Y) *Zea mays*

BONUS

*19) **LIFE SCIENCE** *Multiple Choice* Which of the following is TRUE about a typical liver cell:

- W) most genes are arranged in operon-like clusters
- X) it has very few mitochondria
- Y) most genes are transcribed continuously
- Z) most of the DNA does not code for proteins

ANSWER: Z) MOST OF THE DNA DOES NOT CODE FOR PROTEINS

TOSS-UP

20) **MATH** *Short Answer* How many degrees are in one internal angle of a regular pentagon?

ANSWER: 108°

BONUS

20) **MATH** *Short Answer* A farmer wishes to make a straight barbed wire fence 80 feet long. He wants to have a fence post every 8 feet. How many fence posts does he need?

ANSWER: 11

(Solution: one at the start and one every 8 feet there after $80/8 + 1 = 11$)

TOSS-UP

21) **LIFE SCIENCE** *Multiple Choice* Which of the following is the best description of a cell membrane also known as the plasma membrane?

- W) it is permeable and made of mostly proteins
- X) it is semi-permeable and made mostly of proteins in a lipid bilayer
- Y) it is impermeable and made up mostly of lipids
- Z) it is a fluid mosaic composed of a protein bilayer

ANSWER: X) IT IS SEMI-PERMEABLE AND MADE MOSTLY OF PROTEINS IN A LIPID BILAYER

BONUS

*21) **LIFE SCIENCE** *Multiple Choice* The development of embryonic cells that allows them to become different specialized cells of different organs and tissue and then function in very different ways in an adult organism is best explained by which of the following:

- W) they have evolved different genomes
- X) they each contain different genes
- Y) they use different genetic codes
- Z) different genes are expressed or turned on and off in different cells

ANSWER: Z) DIFFERENT GENES ARE EXPRESSED OR TURNED ON AND OFF IN DIFFERENT CELLS

TOSS-UP

*22) **PHYSICAL SCIENCE** *Multiple Choice* To describe a force you must give:

- W) the origin of the force
- X) its magnitude
- Y) the mass of an object
- Z) its direction and magnitude

ANSWER: Z) ITS DIRECTION AND MAGNITUDE

BONUS

*22) **PHYSICAL SCIENCE** *Short Answer* Order the following substances from the LEAST dense to the MOST dense: gold, water at 1°C, water at 4°C, iron

ANSWER: WATER AT 1°C; WATER AT 4°C; IRON; GOLD
(Solution: water is most dense at 3.98)

TOSS-UP

*23) **GENERAL SCIENCE** *Short Answer* A person who had polydactyilia would have too many of what?

ANSWER: DIGITS (ACCEPT: FINGERS AND/OR TOES)

BONUS

*23) **GENERAL SCIENCE** *Short Answer* Consider a tree that grows 20 centimeters taller each year. If you marked a spot 100 centimeters from ground level up the trunk of the tree, about how high from the ground would the mark be in 6 years?

ANSWER: 100 CENTIMETERS [ACCEPT: BETWEEN 90-110 CENTIMETERS]

TOSS-UP

24) **GENERAL SCIENCE** *Short Answer* Which of the following is the largest in length? A light year, 1,860,000 miles, a parsec, a furlong, a hectometer

ANSWER: A PARSEC

BONUS

*24) **GENERAL SCIENCE** *Short Answer* Order the following from the most acidic to the most basic: household liquid ammonia, milk, tomato juice, pure water.

ANSWER: TOMATO JUICE, PURE WATER, MILK, HOUSEHOLD LIQUID AMMONIA

TOSS-UP

25) **LIFE SCIENCE** *Multiple Choice* Passive transport differs mostly from active transport since passive transport requires:

- W) ATP
- X) spectrin proteins
- Y) no energy
- Z) mitochondria

ANSWER: Y) NO ENERGY

BONUS

*25) **LIFE SCIENCE** *Multiple Choice* After taking 20 readings of the outside winter air temperature during an experiment, Kathy realizes that the first reading is more than 20% higher than all the following readings. She quickly remembers that she forgot to allow the thermometer, which was stored in a warm room, to adjust to the outside temperature. Which of the following is the most appropriate solution to her problem of what seems to be an experimental error:

- W) discuss the error with the other scientists and then discard the reading
- X) repeat the experiment, and if no other readings are unusually high she can discard the initial high reading as long as she explains why
- Y) repeat the experiment and average in the high reading
- Z) buy a new thermometer

ANSWER: Y) REPEAT THE EXPERIMENT AND AVERAGE IN THE HIGH READING