

ROUND ROBIN 5

TOSS-UP

1) GENERAL SCIENCE *Multiple Choice* If you were looking to purchase naphthalene in a retail store in the USA, which of the following would you be correct in buying:

- W) linseed oil
- X) mothballs
- Y) insect repellent
- Z) Drain-O

ANSWER: X) MOTHBALLS

BONUS

1) GENERAL SCIENCE *Short Answer* The island of Newfoundland is well known for its very wet boggy highlands that have clean but very brown water because it contains a substance that most commonly goes by what name?

ANSWER: TANNIN (ACCEPT: TANNINS)

TOSS-UP

2) EARTH SCIENCE *Multiple Choice* What is the minimum number of locations around the world needed to locate the epicenter of an earthquake?

- W) 3
- X) 10
- Y) 1
- Z) 5

ANSWER: W) 3

BONUS

2) EARTH SCIENCE *Short Answer* Order the following from the most to the least as sources for electrical power produced in the United States: nuclear, hydroelectric, coal

ANSWER: COAL, NUCLEAR, HYDROELECTRIC

TOSS-UP

3) MATHEMATICS *Multiple Choice* In terms of π , what is the volume of a sphere having a radius of 3.

- W) 4π
- X) 24π
- Y) 36π
- Z) 108π

ANSWER: Y) 36π

BONUS

3) MATHEMATICS *Short Answer* How many integers are between the square root of 6 and the square root of 66?

ANSWER: 6

TOSS-UP

4) LIFE SCIENCE *Multiple Choice* Which of the following statements is TRUE?

- W) the human y chromosome has hundreds of known genes
- X) mutations are changes in the genetic code found in DNA
- Y) humans have the largest brains per body size than any other animal that has ever lived on Earth
- Z) all infectious agents are caused by some sort of living organism

ANSWER: X) MUTATIONS ARE CHANGES IN THE GENETIC CODE FOUND IN DNA

BONUS

4) LIFE SCIENCE *Short Answer* What is the name of the type of symbiotic relationship demonstrated by deer and deer ticks?

ANSWER: PARASITISM

TOSS-UP

5) PHYSICAL SCIENCE *Short Answer* What is the most frequently used procedure for purifying liquids consisting of boiling the liquid and condensing the vapor?

ANSWER: DISTILLATION (ACCEPT: SIMPLE, FRACTIONAL OR STEAM DISTILLATION)

BONUS

5) PHYSICAL SCIENCE *Multiple Choice* A hypothetical spaceship is traveling toward the Earth at a speed that is 20% of the speed of light. The space ship shines a beam of light at the Earth and an observer on the Earth measures the speed of the beam of light. The Earth-bound observer would determine the speed of light to be:

- W) increased by the speed of the space ship
- X) decreased by the speed of the space ship
- Y) increased by the speed of the space ship minus the speed of the Earth moving in its orbit around the sun
- Z) unaffected by either the motion of the ship or the Earth

ANSWER: Z) UNAFFECTED BY EITHER THE MOTION OF THE SHIP OR THE EARTH

TOSS-UP

6) GENERAL SCIENCE *Multiple Choice* Telescope lenses are able to gather more light than the lens of the human eye primarily because telescope lenses are:

- W) made of glass
- X) larger
- Y) curved
- Z) less likely to blink

ANSWER: X) LARGER

BONUS

6) GENERAL SCIENCE *Short Answer* On Earth, how many hours long is a solar day, rounded to the first decimal place?

ANSWER: 24.0 HOURS (ACCEPT: 24)

TOSS-UP

7) EARTH SCIENCE *Multiple Choice* What part of the Sun's atmosphere can be seen during a total eclipse of the Sun?

- W) Corona
- X) Core
- Y) photosphere
- Z) Chomosphere

ANSWER: W) CORONA

BONUS

7) EARTH SCIENCE *Short Answer* What is the name given to the boundary between the Earth's Troposphere and the Mesosphere?

ANSWER: TROPOPAUSE

TOSS-UP

8) MATHEMATICS *Multiple Choice* If 360 degrees is equal to 2π radians, what is the number of radians in 45 degrees?

- W) π radians
- X) $\frac{\pi}{2}$ radians
- Y) $\frac{\pi}{4}$ radians
- Z) $\frac{\pi}{8}$ radians

ANSWER: Y) $\frac{\pi}{4}$ radians

BONUS

8) MATHEMATICS *Short Answer* A bus leaves school with 48 students on board. At each stop, one-half of the remaining students get off the bus. How many students are still on the bus after the third stop?

ANSWER: 6 STUDENTS (ACCEPT 6)

TOSS-UP

9) LIFE SCIENCE *Multiple Choice* When uncoagulated whole blood is placed in a tube and centrifuged, it separates into two layers. The red opaque layer at the bottom of the tube is composed of the cellular components of the blood. What is the light yellow layer of clear fluid at the top of the tube fluid called?

- W) Plasma
- X) Serum
- Y) Extracellular Fluid
- Z) Immunoglobulin

ANSWER: W) PLASMA

BONUS

9) LIFE SCIENCE *Short Answer* Order the following 5 digestive system parts, from the part of the digestive tract nearest to the beginning to the part nearest to the end: esophagus, ileum, duodenum, jejunum, uvula

ANSWER: UVULA, ESOPHAGUS, DUODENUM, JEJUNUM, ILEUM

TOSS-UP

10) PHYSICAL SCIENCE *Multiple Choice* Atoms are made up of mostly empty space. Which basic force prevents the atoms of your hand, which are mainly empty space, from easily passing through the atoms in a table top, which are also mainly empty space?

- W) Gravity
- X) The Strong Nuclear Force
- Y) The Electromagnetic Force
- Z) The Weak Nuclear Force

ANSWER: Y) THE ELECTROMAGNETIC FORCE

BONUS

10) PHYSICAL SCIENCE *Short Answer* What are the symbols for the following 3 elements: boron, lead, potassium

ANSWER: BORON = B; LEAD = Pb; POTASSIUM = K

TOSS-UP

11) GENERAL SCIENCE *Short Answer* What is the name of the brightest star in the northern hemisphere of the sky?

ANSWER: SIRIUS

BONUS

11) GENERAL SCIENCE *Multiple Choice* An oil-immersion objective lens primarily improves magnification in a compound light microscope by:

- W) decreasing the wavelength of light entering the ocular lens
- X) eliminating chromatic aberration
- Y) increasing contrast in the image
- Z) increasing the amount of light the lens captures

ANSWER: Z) INCREASING THE AMOUNT OF LIGHT THE LENS CAPTURES

TOSS-UP

12) EARTH SCIENCE *Multiple Choice* Which planet has the greatest surface temperature range?

- W) Venus
- X) Earth
- Y) Mars
- Z) Mercury

ANSWER: Z) MERCURY

BONUS

12) EARTH SCIENCE *Multiple Choice* Governments banned the production and use of what group of chemicals because of the damage they do to the ozone layer.

- W) chlorofluorocarbons
- X) tetra-methanes
- Y) phenols
- Z) ozoneaters

ANSWER: W) CHLOROFLUOROCARBONS

TOSS-UP

13) MATHEMATICS *Multiple Choice* Which one of the following terms would best describe pi?

- W) Whole
- X) Irrational
- Y) Mixed
- Z) Integer

ANSWER: X) IRRATIONAL

BONUS

13) MATHEMATICS *Short Answer* If 0.5% of a number is 2, what is the number?

ANSWER: 400

TOSS-UP

14) LIFE SCIENCE *Multiple Choice* What is the part of the brain that is most directly involved in walking and coordination?

- W) Pre-frontal lobe
- X) Cerebrum
- Y) Medulla
- Z) Cerebellum

ANSWER: Z) CEREBELLUM

BONUS

14) LIFE SCIENCE *Short Answer* In the cross-section of a buttercup root, order the following 4 tissues from those found in the outermost regions to the inner most of a root: epidermis, cortex, endodermis, xylem.

ANSWER: EPIDERMIS, CORTEX, ENDODERMIS, XYLEM

TOSS-UP

15) PHYSICAL SCIENCE *Multiple Choice* Why do the planets Uranus and Neptune appear blue?

- W) Their atmospheres absorb blue light very efficiently.
- X) The wind speeds are very high and so show a strong blue shift.
- Y) Their surfaces are covered with water and their clouds are very thin.
- Z) Their atmospheres absorb red light very efficiently.

ANSWER: Z) THEIR ATMOSPHERES ABSORB RED LIGHT VERY EFFICIENTLY

BONUS

15) PHYSICAL SCIENCE *Short Answer* Most of the known asteroids orbit the Sun in a belt that is situated between the orbits of two planets. Name the two planets.

ANSWER: MARS AND JUPITER

TOSS-UP

16) What is the most common term given to the collection of 12 constellations that the Sun appears to pass in front of during a full Earth year?

ANSWER: ZODIAC

BONUS

16) GENERAL SCIENCE *Short Answer* A 1 pint 9 ounce bottle of vinegar contains how many fluid ounces?

ANSWER: 25

TOSS-UP

17) EARTH SCIENCE *Multiple Choice* A Newtonian telescope uses which of the following as its primary device for gathering light?

- W) a lense
- X) a mirror
- Y) a magnet
- Z) a crystal

ANSWER: X) A MIRROR

BONUS

17) EARTH SCIENCE *Short Answer* When two forward moving glaciers merge and end in one terminus, a band of rocky debris is formed that runs down the center of the glacier creating what type of moraine?

ANSWER: MEDIAL MORAINE

TOSS-UP

18) MATHEMATICS *Multiple Choice* Which number is largest?

- W) 5^3
- X) 6^2
- Y) 4^2
- Z) 2^5

ANSWER: W) 5^3

BONUS

18) MATHEMATICS *Short Answer* Factor the following polynomial: $x^3 - 9x$

ANSWER: $x(x-3)(x+3)$ ACCEPT: $x(x+3)(x-3)$

TOSS-UP

19) LIFE SCIENCE *Short Answer* What scientific term means inflammation of the joints?

ANSWER: ARTHRITIS (ACCEPT: OSTEOARTHRITIS)

BONUS

19) LIFE SCIENCE *Short Answer* What is the most common name of the type of enzyme that uses RNA as a template to form a complementary strand of DNA is?

ANSWER: REVERSE TRANSCRIPTASE

TOSS-UP

20) PHYSICAL SCIENCE *Multiple Choice* For a brick of gold, which of the following properties would change if you transported the brick from the surface of the Earth to the surface of the Moon?

- W) Mass
- X) Weight
- Y) Volume
- Z) Density

ANSWER: X) WEIGHT

BONUS

20) PHYSICAL SCIENCE *Short Answer* How many molecules of CO₂ are present in 1 mole of CO₂?

ANSWER: 6.022×10^{23} (ACCEPT: 6.02 or 6.023×10^{23} or AVOGADRO'S NUMBER)

TOSS-UP

21) PHYSICAL SCIENCE *Short Answer* What very common modern masonry construction material found in many large buildings was actually invented by the Romans?

ANSWER: CEMENT (ACCEPT: CONCRETE)

BONUS

21) PHYSICAL SCIENCE *Short Answer* Consider a lever with a 6-gram weight located 3 centimeters from its fulcrum. A 2-gram weight is placed on the opposite side of the lever. How far, in centimeters, must the 2-gram weight be placed from the fulcrum to equally balance the 6-gram weight?

ANSWER: 9 CENTIMETERS

TOSS-UP

22) EARTH SCIENCE *Multiple Choice* Two ores of iron are hematite and magnetite. They can be identified on the basis of the streak test. What color is the hematite streak and what color is the magnetite streak, respectively?

- W) Gray and black
- X) White and red
- Y) Greenish and yellow
- Z) Reddish orange and black

ANSWER: Z) REDDISH ORANGE AND BLACK

BONUS

22) EARTH SCIENCE *Short Answer* What planet surprised Galileo because it had phases like to moon?

ANSWER: VENUS

TOSS-UP

23) MATHEMATICS *Short Answer* What is the slope of a line that is parallel to the line $y = -\frac{2}{3}x + 6$?

ANSWER: $-\frac{2}{3}$

BONUS

23) MATHEMATICS *Short Answer* In terms of π , what is the circumference of a circle whose area is 64π square meters?

ANSWER: 16π meters

TOSS-UP

24) LIFE SCIENCE *Short Answer* What is the name of the only blood vessel in the human body that carries oxygen-rich blood AWAY from the heart?

ANSWER: PULMONARY VEIN

BONUS

24) LIFE SCIENCE *Short Answer* According to the principle of complementary base pairing, if you have DNA that consists of 15% thymine, what is the percentage of cytosine in the molecule?

ANSWER: 35% (Note that thymine does not pair with cytosine; It pairs with guanine.)

TOSS-UP

25) PHYSICAL SCIENCE *MultipleChoice* What is the major advantage of using nuclear power in submarines?

- W) Nuclear power plants are quieter than any other type of propulsion system
- X) Nuclear power plants require fewer operators
- Y) Nuclear power plants can operate for decades without requiring oxygen from the Earth's atmosphere
- Z) Nuclear power plants require less weight than most other propulsion systems

ANSWER: Y) NUCLEAR POWER PLANTS CAN OPERATE FOR DECADES WITHOUT REQUIRING OXYGEN FROM THE EARTH'S ATMOSPHERE

BONUS

25) PHYSICAL SCIENCE *Short Answer* Calculate the density of an object, in grams per cubic centimeter, from the following information: When an object with a mass of 25 grams is placed in a graduated cylinder filled with water, the water level changes from 12.8 to 15.3 cubic centimeters.

ANSWER: 10

(Solution: $D = M/V; = 25g/15.3-12.8; = 10g/cm^3$)