

ROUND 2

TOSS-UP

1) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT a carbonate?

- W) Dolomite
- X) Aragonite
- Y) Malachite (read as: MAH-lah-kyt)
- Z) Labradorite

ANSWER: Z) LABRADORITE

BONUS

1) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following moons has the highest surface albedo?

- W) Phobos
- X) Europa
- Y) Io
- Z) Enceladus (read as: ehn-SEHLL-ah-duhs)

ANSWER: Z) ENCELADUS

TOSS-UP

2) PHYSICAL SCIENCE *Short Answer* If the voltage across a 3-ohm resistor is 6 volts, what is the current, in amperes, flowing through the circuit?

ANSWER: 2

BONUS

2) PHYSICAL SCIENCE *Multiple Choice* Which of the following is an intensive property?

- W) Mass
- X) Volume
- Y) Length
- Z) Melting point

ANSWER: Z) MELTING POINT

TOSS-UP

3) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is NOT a type of fine-grained igneous rock?

- W) Rhyolite (read as: RY-oh-lyt)
- X) Peridotite (read as: peh-RI-doh-tyt)
- Y) Komatite
- Z) Basalt

ANSWER: X) PERIDOTITE

BONUS

3) EARTH AND SPACE SCIENCE *Short Answer* What type of geomorphic feature forms on the outside of a river bend?

ANSWER: CUT BANK (ACCEPT: RIVER CLIFF)

TOSS-UP

4) ENERGY *Multiple Choice* During which of the following periods were coals generally lignite deposits still containing significant volatile material?

- W) Carboniferous
- X) Permian
- Y) Secondary
- Z) Tertiary

ANSWER: Z) TERTIARY

BONUS

4) ENERGY *Multiple Choice* Which of the following statements is NOT true about solar dish-engine systems?

- W) Direct-beam energy is concentrated at a focal point on a dish made of mirrors
- X) The concentrated solar beam is converted to heat that is transferred to an engine
- Y) Mercury or copper are commonly used as heat transfer media
- Z) The engine uses heat to create mechanical power that drives a generator

ANSWER: Y) MERCURY OR COPPER ARE COMMONLY USED AS HEAT TRANSFER MEDIA

TOSS-UP

5) LIFE SCIENCE *Short Answer* Which bivalve has complex eyes, including a lens and retina?

ANSWER: SCALLOP

BONUS

5) LIFE SCIENCE *Short Answer* According to biological classification, what is the order of rabbits?

ANSWER: LAGOMORPHA

TOSS-UP

6) MATH *Multiple Choice* Which of the following is perpendicular to the line $y = -2x + 6$?

W) $2y = x + 4$

X) $x + 2y = 4$

Y) $y = 2x - 6$

Z) $y = \frac{-1}{2}x - 6$

ANSWER: W) $2y = x + 4$

BONUS

6) MATH *Short Answer* In simplest radical form, what is the area, in square units, of a right triangle with a hypotenuse length of 12 and one leg with a length of 6?

ANSWER: $18\sqrt{3}$

TOSS-UP

7) LIFE SCIENCE *Short Answer* What is the genus of the bacteria that causes typhoid fever?

ANSWER: *SALMONELLA*

BONUS

7) LIFE SCIENCE *Multiple Choice* Which of the following organisms is NOT a thallophyte (read as: THAH-loh-fyt)?

- W) Entamoeba (read as: ehn-tah-MEE-bah)
- X) Cladophora
- Y) Chara (read as: KAH-rah)
- Z) Ulothrix

ANSWER: W) ENTAMOEBA

TOSS-UP

8) ENERGY *Short Answer* In a building, what is usually the leakiest site when it comes to energy, both in terms of losing heat in the winter and also gaining heat in the summer?

ANSWER: WINDOW

BONUS

8) ENERGY *Multiple Choice* Which of the following statements is NOT true about honeybee flight?

- W) They flap their wings very quickly
- X) Their wings beat over a very short arc
- Y) When they want to generate more power, they increase the arc of their wing strokes
- Z) Their flight muscles are physiologically very similar to those of fruit flies

ANSWER: Z) THEIR FLIGHT MUSCLES ARE PHYSIOLOGICALLY VERY SIMILAR TO THOSE OF FRUIT FLIES

TOSS-UP

9) PHYSICAL SCIENCE *Multiple Choice* Which of the following elements is NOT diatomic in its natural state?

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

ANSWER: W) SULFUR

BONUS

9) PHYSICAL SCIENCE *Short Answer* What is the maximum number of electrons that an n = 4 shell can accommodate?

ANSWER: 32

TOSS-UP

10) LIFE SCIENCE *Multiple Choice* Which of the following statements is NOT true about most carp?

- W) They possess Weberian ossicles
- X) They have teeth on their inferior pharyngeal bones
- Y) They are highly tolerant of salt water
- Z) They have a wide geographical range

ANSWER: Y) THEY ARE HIGHLY TOLERANT OF SALT WATER

BONUS

10) LIFE SCIENCE *Short Answer* What is the name of a method of fertilization in which the ovum is fertilized within a fallopian tube of a fertile female donor for transplantation into an infertile recipient?

ANSWER: IN VIVO FERTILIZATION

TOSS-UP

11) MATH *Short Answer* Thirty percent of the days of each month have been designated as vacation days. To the nearest day, how many days of vacation should be in April?

ANSWER: 9

BONUS

11) MATH *Short Answer* The sum of 3 consecutive integers is 21. What is their product?

ANSWER: 336

TOSS-UP

12) GENERAL SCIENCE *Short Answer* When measuring the volume of a liquid in a graduated cylinder, what is the name of the curve at the surface of the liquid?

ANSWER: MENISCUS

BONUS

12) GENERAL SCIENCE *Short Answer* By number, identify all of the following three statements that are NOT true about tornado safety: 1) you should open windows if a tornado is approaching; 2) highway overpasses provide safe shelters from tornadoes; 3) rivers form a barrier to tornadoes.

ANSWER: 1, 2, AND 3 OR ALL

TOSS-UP

13) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following objects is likely to have the lowest albedo?

- W) Weathered granite
- X) Sea ice
- Y) Fresh basalt
- Z) Rainforest canopy

ANSWER: Y) FRESH BASALT

BONUS

13) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following describes when flooding is most likely to occur as the result of a slow moving, relatively long term, moderate rain event?

- W) After the rain has ended
- X) After it has been raining for about an hour
- Y) After it has been raining for a few hours
- Z) At the beginning of the rainstorm

ANSWER: W) AFTER THE RAIN HAS ENDED

TOSS-UP

14) GENERAL SCIENCE *Short Answer* By name or number, identify all of the following four organs directly involved in excretory system processes: 1) lungs, 2) heart, 3) skin, 4) kidneys.

ANSWER: LUNGS, SKIN, AND KIDNEYS (ACCEPT: 1, 3, AND 4)

BONUS

14) GENERAL SCIENCE *Short Answer* What is the name of the air mass that forms over North Africa during the summer, carrying dust from Africa long distances?

ANSWER: SAHARAN AIR LAYER (ACCEPT: S.A.L.)

TOSS-UP

15) LIFE SCIENCE *Multiple Choice* Which of the following characteristics is NOT true of the herbicide Paraquat?

- W) It is quick acting
- X) It is non-selective, killing a wide range of annual grasses and broad-leaved weeds
- Y) It is linked to the development of Parkinson's disease
- Z) It remains biologically active in the soil for approximately 60 days

ANSWER: Z) IT REMAINS BIOLOGICALLY ACTIVE IN THE SOIL FOR APPROXIMATELY 60 DAYS

BONUS

15) LIFE SCIENCE *Short Answer* By name or number, identify all of the following four choices that are examples of birth defects: 1) spina bifida, 2) hypospadias (read as: hy-poh-SPAY-dee-ahs), 3) Tay-Sachs, 4) phenylketonuria (read as: fee-nil-kee-tohn-UHR-ee-ah).

ANSWER: SPINA BIFIDA, HYPOSPADIAS, TAY-SACHS, PHENYLKETONURIA (ACCEPT: 1, 2, 3, AND 4 OR ALL)

TOSS-UP

16) GENERAL SCIENCE *Short Answer* By name or number, range the following four biomes from highest to lowest average temperature: 1) taiga, 2) tropical rainforest, 3) tundra, 4) temperate deciduous (read as: di-SI-juh-uhs) forest.

ANSWER: TROPICAL RAIN FOREST, TEMPERATE DECIDUOUS FOREST, TAIGA, TUNDRA (ACCEPT: 2, 4, 1, 3)

BONUS

16) GENERAL SCIENCE *Short Answer* By name or number, identify all of the following four animals that are NOT filter feeders: 1) mysid, 2) krill, 3) whale shark, 4) crab spider.

ANSWER: CRAB SPIDER (ACCEPT: 4)

TOSS-UP

17) MATH *Short Answer* Given the graph of a quadratic polynomial function, what is the minimum number of ordered pairs on the graph needed in order to determine the coefficients of the polynomial?

ANSWER: 3

BONUS

17) MATH *Short Answer* Fred is twice as old as Marco and Marco is 4 years older than Ray. If Larz is 2 years older than Fred, and Ray is 6 years old, how old is Larz?

ANSWER: 22 YEARS OLD

TOSS-UP

18) PHYSICAL SCIENCE *Multiple Choice* Which of the following elements has chemical properties similar to oxygen?

- W) Nitrogen
- X) Fluorine
- Y) Sulfur
- Z) Neon

ANSWER: Y) SULFUR

BONUS

18) PHYSICAL SCIENCE *Short Answer* What is the IUPAC name for $\text{Sr}(\text{OH})_2$?

ANSWER: STRONTIUM HYDROXIDE

TOSS-UP

19) EARTH AND SPACE SCIENCE *Multiple Choice* The aurora borealis, or northern lights, would not be observed if Earth lacked which of the following?

- W) Oxygen in its atmosphere
- X) A moon
- Y) A magnetic field
- Z) High altitude clouds

ANSWER: Y) A MAGNETIC FIELD

BONUS

19) EARTH AND SPACE SCIENCE *Short Answer* A convergent fault, such as the large one at the front of the Himalayan Mountains, forms in which type of stress environment?

ANSWER: COMPRESSION

TOSS-UP

20) GENERAL SCIENCE *Short Answer* What is the second most abundant mineral in the Earth's continental crust, composed only of silicon and oxygen?

ANSWER: QUARTZ

BONUS

20) GENERAL SCIENCE *Short Answer* What is the name for the scientific order of frogs?

ANSWER: ANURA

TOSS-UP

21) PHYSICAL SCIENCE *Short Answer* What is the empirical formula of $C_6H_{12}O_6$?

ANSWER: CH_2O

BONUS

21) PHYSICAL SCIENCE *Short Answer* By name or number, rank the speed of sound through the following three mediums from fastest to slowest at 25° Celsius: 1) aluminum, 2) air, 3) water.

ANSWER: ALUMINUM, WATER, AIR (ACCEPT: 1, 3, 2)

TOSS-UP

22) EARTH AND SPACE SCIENCE *Multiple Choice* Mars is observed to have a very thin atmosphere compared to Earth. Which of the following statements does NOT help explain this difference?

- W) Mars is further from the Sun than Earth
- X) Mars is smaller than Earth
- Y) Mars has less geothermal activity than Earth
- Z) Mars is cooler than Earth

ANSWER: W) MARS IS FURTHER FROM THE SUN THAN EARTH

BONUS

22) EARTH AND SPACE SCIENCE *Short Answer* What do hatchured lines on a topographic map indicate?

ANSWER: A DEPRESSION

TOSS-UP

23) PHYSICAL SCIENCE *Multiple Choice* Although none of the following are concrete proof of a chemical change, which of the following *definitely* could NOT be used as an indication that a chemical change has occurred?

- W) Color change
- X) Change in size
- Y) Production of heat
- Z) Formation of gas

ANSWER: X) CHANGE IN SIZE

BONUS

23) PHYSICAL SCIENCE *Short Answer* What force, in newtons, does an electric field of 1 volt per meter exert on a particle with a charge of 2 coulombs?

ANSWER: 2

TOSS-UP

24) ENERGY *Short Answer* What kind of energy recovery mechanism slows a hybrid vehicle by converting its kinetic energy into electric energy and storing it in a battery for later use?

ANSWER: REGENERATIVE BRAKE

BONUS

24) ENERGY *Short Answer* Which U.S. state has the largest demonstrated coal reserves?

ANSWER: MONTANA

TOSS-UP

25) MATH *Short Answer* The volume of a cube is 27 cubic centimeters. What is the surface area, in square centimeters, of this cube?

ANSWER: 54

BONUS

25) MATH *Short Answer* Express the following in standard polynomial form:
 $5x^4y^7 \times zy \times 11x^2z^2y$ (read as: 5x to the fourth y to the seventh times zy times 11 x squared z squared y).

ANSWER: $55x^6y^9z^3$