

1

1. Biology

Toss Up: Short Answer

The broad climatic zones that Earth's environments are organized into are called

Toss Up Answer: BIOMES

Bonus: Short Answer

What biome makes up the majority of NY State?

Bonus Answer: temperate forest biome

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2. Physics

Toss Up: Multiple Choice

For an ohmic conductor, doubling the voltage without changing the resistance will cause the current to

W) decrease by a factor of 2

X) decrease by a factor of 4

Y) increase by a factor of 4

Z) increase by a factor of 2

Toss Up Answer: Z

Bonus: Short Answer

If a 60-watt lightbulb operates at a voltage of 120 V, what is the resistance of the bulb?

Bonus Answer: 240 ohms

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3. Earth and Space Science

Toss Up: Short Answer

What are two general types of soils that have developed in the United States?

Toss Up Answer: pedocals and pedalfers

Bonus: Short Answer

What are the two most prominent elements dissolved in seawater?

Bonus Answer: Chlorine and Sodium

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4. Chemistry

Toss Up: Multiple Choice

What is the name given to the equation $P_1V_1=P_2V_2$?

W) Ideal Gas Law

X) Charles's Law

Y) Boyle's Law

Z) Gay-Lussac's Law

Toss Up Answer: Y

Bonus: Short Answer

What are bond angles to the nearest tenth of a molecule with a tetrahedral molecular geometry?

Bonus Answer: 109.5 degrees

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5. Mathematics

Toss Up: Short Answer

What is the quadratic formula?

Toss Up Answer: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Bonus: Short Answer

Solve for y if $x = \frac{5}{6}y + \frac{116}{3}y + \frac{4}{2}$ in terms of x

Bonus Answer: $y = \frac{(x-2)}{78}$

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6. Chemistry

Toss Up: Multiple Choice

Which of the following is a polar molecule?

W) SO₂

X) CH₄

Y) SF₆

Z) BF₄

Toss Up Answer: W

Bonus: Short Answer

Fill in the blanks in the following statement to make it true. Ionic compounds are ____ conductors in their solid state, but ____ conductors when dissolved in water.

Bonus Answer: poor; good (accept equivalent answers)

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7. Physics

Toss Up: Multiple Choice

Negative charges are accelerated by electric fields toward points

W) at lower electric potentials

X) at higher electric potentials

Y) where the electric field is weaker

Z) where the electric field is stronger

Toss Up Answer: X

Bonus: Multiple Choice

The potential at point A in an electric field is 10V higher than at point B. If a negative charge, $q = -2 \text{ C}$, is moved from point A to point B, then the potential energy of this charge will

W) decrease by 20 J

X) decrease by 5 J

Y) increase by 5 J

Z) increase by 20 J

Bonus Answer: Z

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8. Chemistry

Toss Up: Short Answer

What element has the largest atomic radius?

Toss Up Answer: Francium

Bonus: Multiple Choice

What is the most electronegative element?

- W) Francium
- X) Beryllium
- Y) Fluorine
- Z) Lithium

Bonus Answer: Y

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9. Physics

Toss Up: Multiple Choice

As defined in physics, speed is:

- W) a vector quantity
- X) always negative
- Y) always zero
- Z) always positive

Toss Up Answer: Z

Bonus: Multiple Choice

Electric current may be expressed in which one of the following units?

- W) joules/coulomb
- X) coulombs/second
- Y) coulombs/volt
- Z) ohms/second

Bonus Answer: X

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10. Earth and Space Science

Toss Up: Multiple Choice

Which change in the stream system would most likely cause deposition of larger particles to be farther offshore?

- W) a decrease in the stream's gradient
- X) a decrease in the quantity of large particles
- Y) an increase in the stream's velocity
- Z) an increase in the density of large particles

Toss Up Answer: Y

Bonus: Multiple Choice

Which set of characteristics best describes a ventifact (wind-eroded rock)?

- W) round and smooth
- X) rounded with striations
- Y) smooth and angular with pitted surfaces
- Z) rough and angular with a mix of fresh and weathered surfaces

Bonus Answer: Y

11. Physics

Toss Up: Multiple Choice

Whose principle or law states that each point on a wavefront may be considered a new wave source?

- W) Snell's Law
- X) Huygen's principle
- Y) Young's Law
- Z) Hertz's Law

Toss Up Answer: X

Bonus: Multiple Choice

The wave nature of light is demonstrated by which of the following?

- W) Diffraction
- X) Color
- Y) Length
- Z) Speed of light

Bonus Answer: W

12. Chemistry

Toss Up: Short Answer

By name or number, list the following atoms in order of increasing electronegativity:

1. Flourine
2. Chlorine
3. Bromine

Toss Up Answer: Bromine, Chlorine, Flourine (accept 3,2,1)

Bonus: Short Answer

Which element has the highest electronegativity?

Bonus Answer: Flourine

13. Physics

Toss Up: Short Answer

What fuel is mostly used in a nuclear power-generation station?

Toss Up Answer: Uranium-235 (Do not accept: Uranium or Uranium-238)

Bonus: Multiple Choice

Dark energy and dark matter comprise approximately how much of the known universe?

- W) 50%
- X) 75%
- Y) 95%
- Z) 99%

Bonus Answer: Y

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14. Chemistry

Toss Up: Multiple Choice

Which of the following is a nonpolar molecule?

- W) Carbon dioxide
- X) Water
- Y) Ammonia
- Z) Hydrochloric acid

Toss Up Answer: W

Bonus: Short Answer

Which of the following forms of radioactive decay has (or have) no electrical charges? 1) Alpha Decay 2) Beta Decay 3) Gamma Decay

Bonus Answer: 3 only

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15. Earth and Space Science

Toss Up: Multiple Choice

How are rocks sorted in water erosion?

- W) Sorted, rounded, smooth
- X) Not sorted, rounded, smooth
- Y) Not sorted, not rounded, smooth
- Z) Not sorted, not rounded, not smooth

Toss Up Answer: W

Bonus: Short Answer

U shaped valleys are made by what type of agent of erosion?

Bonus Answer: Glaciers.

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16. Mathematics

Toss Up: Short Answer

What is the solution for square root of the quantity $x+5$ equals $x+3$

Toss Up Answer: -1 *(do not except: [-1 and -4] or [-3])

Bonus: Short Answer

In a certain language of a certain people of a certain world, to frack a number is to find the average of the number and its square. For example, the frack of 2 is 3 since it is the average of 2 and 2 squared. what is the frack of 100?

Bonus Answer: 5050

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17. Biology

Toss Up: Short Answer

Which plant tissue conducts water from the roots to the leaves?

Toss Up Answer: Xylem

Bonus: Multiple Choice

Which system rids of nitrogenous waste?

- W) Digestive system
- X) Integumentary system
- Y) Respiratory system
- Z) Urinary system

Bonus Answer: Z

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18. Mathematics

Toss Up: Short Answer

Find how many different 4-digit numbers can be formed from the digits 1, 3, 5, 6, 8 and 9 if each digit may be used only once.

Toss Up Answer: 360

Bonus: Short Answer

A true or false test has six questions. If a person guesses the answers, how many different ways are there to answer the test?

Bonus Answer: 64

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19. Earth and Space Science

Toss Up: Multiple Choice

What is the closest star to earth

- W) Sirius
- X) Betelgeuse
- Y) Alpha proxima
- Z) The sun

Toss Up Answer: Z

Bonus: Short Answer

What is the closest star to the sun

Bonus Answer: Proxima centauri

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20. Mathematics

Toss Up: Multiple Choice

If a statement about a relationship between natural quantities has been tested many times, and has not been contradicted, what is it?

- W) Fact
- X) Hypothesis
- Y) Law
- Z) Theory

Toss Up Answer: Y

Bonus: Multiple Choice

What is a framework that includes many well-tested and verified hypotheses about one or more aspects of the natural world?

- W) Fact

X) Hypothesis

Y) Law

Z) Theory

Bonus Answer: Z

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21. Biology

Toss Up: Short Answer

What hormone regulates sleep cycles?

Toss Up Answer: Melatonin

Bonus: Short Answer

What blood type is considered the universal donor?

Bonus Answer: O-, O-neg, O-negative

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22. Mathematics

Toss Up: Short Answer

What function is the inverse of $y = 3x + 4$?

Toss Up Answer: $y = x - \frac{4}{3}$

Bonus: Short Answer

Giving your answer as an ordered pair, find the solution of the system of the following 2 equations: $2x + 3y = 8$, and $3x - 2y = -1$

Bonus Answer: (1,2)

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23. Energy

Toss Up: Short Answer

Used normally, a 150-watt, 120 volt light bulb requires how many amps of current?

Toss Up Answer: 1.25 Amps

Bonus: Short Answer

If 10 joules of energy are required to move 5 coulombs of charge between two points, the potential difference between the two points is equal to how many volts?

Bonus Answer: 2 volts

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24. Earth and Space Science

Toss Up: Short Answer

How many planets in our solar system have moons?

Toss Up Answer: 6

Bonus: Short Answer

What layer of the atmosphere lies between the troposphere and mesosphere?

Bonus Answer: Stratosphere

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25. Biology

Toss Up: Multiple Choice

What is the main function of a vacuole in a cell?

- W) storage
- X) coordination
- Y) synthesis of molecules
- Z) release of energy

Toss Up Answer: W

Bonus: Multiple Choice

If 15% of a DNA sample is made up of thymine, T, what percentage is made up of cytosine, C?

- W) 15%
- X) 35%
- Y) 70%
- Z) 85%

Bonus Answer: X

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