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Science Bowl Lightning Round

1)BIOLOGY Multiple Choice Which of the following is true?

W) Effects of flashing red and far-red light on plants are irreversible.

X) The chromophore isomer Pr directly stimulates germination.

Y) Pfr inhibits branching.

Z) Pr stimulates vertical growth.

ANSWER: Z

2)MATH Multiple Choice: A triangle with two side lengths 7 and 14 may not have a third side length of which of the following?

W) 9

X) 10

Y) 7

Z) 20

ANSWER: Y

3) EARTH/ASTRO Short Answer: The great lowland plains covering 17% of the moon’s surface are known as what? (Hint: It is Latin for sea)

ANSWER: Mare or maria

4) PHYSICS Multiple Choice: Which of the following could be true according to the ideal gas law? Assume quantities not mentioned remain constant.

W) As temperature increases, the gas expands.

X) As pressure increases, temperature decreases.

Y) As volume increases, pressure increases.

Z) As temperature decreases, average kinetic energy remains constant.

ANSWER: W

5) CHEMISTRY Short Answer: What is the molar mass of carbon dioxide to the nearest digit?

ANSWER: 44 grams/ mole

6) BIOLOGY Short Answer What is the name of the female multicellular organs that produce gametes in land plants?

ANSWER: Archegonia

7) MATH Short Answer Evaluate the definite integral of the function f(x)= 3 on the interval [2, 7].

ANSWER: 15

8) EARTH/ASTRO Mult. Choice: Which of the following is false about Jupiter?

W) Its atmosphere is approximately 78% hydrogen.

X) Violently active volcanism of Io is caused by tidal heating.

Y) Jupiter’s atmosphere is dominated by belt-zone circulation.

Z) The forward scattering effect says Jupiter’s ring is made of large particles.

ANSWER: Z

9)PHYSICS Multiple Choice: Which of the following, according to the kinetic theory of gases, is false?

W) Gas molecules interact only through sort-rang forces during elastic collisions.

X) All gas molecules are identical.

Y) Gas molecules make elastic collisions with the walls.

Z) Gas molecules do not obey Newton’s laws of motion and as a whole move randomly.

ANSWER: Z

10) CHEMISTRY Short Answer: Give the coefficients of the balanced equation for the following: Na + H2O à NaOH + H2.

ANSWER: 2, 2, 2, 1

11) BIOLOGY MULTIPLE Choice: In which geologic time period did the first tetrapods and insects appear?

W) Devonian

X) Triassic

Y) Paleogene

Z) Cambrian

ANSWER:W

12) MATH Multiple Choice: What is the sum of the geometric series of which the first term is 0.5 and the second is 0.25?

W) 0.5

X) 0.6

Y) 0.75

Z) 0.8

ANSWER: W

13) EARTH/ ASTRO Short Answer: What is the name of flamelike structures 100-1000 km in diameter that extend up to 10,000 km above the photosphere and last from 5-15 minutes?

ANSWER: Spicules

14) PHYSICS Short Answer: What is the name of the principle which states that if two or more traveling waves are moving through a medium, the resultant wave is the equivalent fo the sm of the individual waves point by point?

ANSWER: Superposition principle

15) CHEMISTRY Multiple Choice: Which of the following states that no more than 2 electrons in an atom have the same set of 4 quantum numbers?

W) Aufbau Principle

X) Hund’s rule

Y) Pauli Exclusion Principle

Z) Double Spin rule

ANSWER: Y

16) BIOLOGY Short Answer: What amino acid does the start codon represent?

ANSWER: Met or Methionine

17) MATH Short Answer: The limit as x approaches 0 of the quantity (negative sin2x)/(x) is equal to what value?

ANSWER: - 2

18) EARTH/ ASTRO Multiple Choice: Our sun is found in which region of the H-R diagram?

W) Top right

X) Top left

Y) Lower right

Z) Lower left

ANSWER: Y

19) PHYSICS Short Answer: What is the name of the constant Y is the tensile strain equation?

ANSWER: Young’s modulus

20) CHEMISTRY Multiple Choice: Which of the following has the largest ionic radius?

W) Na +1

X) Ca+2

Y) O -2

Z) Te -2

ANSWER: Z

21) BIOLOGY Short Answer: Which enzyme in the C4 pathway adds CO2 to PEP in the mesophyll cell?

ANSWER: PEP carboxylase

22) MATH Short Answer: What is the derivative of the function xsinx?

ANSWER: xcosx + sinx

23) EARTH/ ASTRO Multiple Choice: Which type of volcano results from eruptions of mostly small pieces of scoria and pyroclastics that build up around the vent? Most volcanoes of this tpe erupt once; an example is Sunset Crater in Arizona.

W) Stratovolcano

X) Cinder cone

Y) Composite volcano

Z) Supervolcano

ANSWER: X

24) PHYSICS: Multiple Choice: When the coefficient of static friction of an object and surface is 0.5, and the normal force exerted by the surface is 5 N, force of static friction cannot be which of the following?

W) 0.4 N

X) 1.2 N

Y) 2.3 N

Z) 2.6 N

ANSWER: Z

25) CHEMISTRY Short Answer: The combination of atomic orbitals that results in an overall raising of energy is known as what?

ANSWER: antibonding orbital