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TOSS-UP

Matitude Mar At 12 198 1) BIOLOGY Short Answer What common organic molecule is made of an adenine residue, a ANSWER: ATP (ACCEPT: ADENOSINE TRIPHOSPHATE) ribose sugar, and three phosphates: Millinin 教教教·蒙豫 mytitute 新春 茶 溪 %

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- 1) BIOLOGY Multiple Choice Transfer RNA charged with an amino acid is most accurately Milling 新春·養像 Mininte 教教教·養學 called:

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Y.

Y.

Y.

Y.

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Y.

- W) a nascent tRNA
 X) a tRNA X) a tRNA with an amino acid attached
 - Y) an amino acyl tRNA

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Z) t-primed RNA

ANSWER: Y) AN AMINO ACYL tRNA

TOSS-UP

- 2) CHEMISTRY Multiple Choice In general, which of the following stereoisomers are the most Indianic Mark 18 180 dissimilar in terms of their physical and chemical properties:
- W) conformational
- X) mirror-image
- Y) enantiomers (EE-nan-tee-oh-mers)
- Z) geometric

ANSWER: Z) GEOMETRIC

BONUS

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2) CHEMISTRY Short Answer Under constant temperature conditions, a sample of gas has a volume of 8 liters at a pressure of 1.5 atmospheres. If a 2 liter container is used to hold the gas, calculate the new pressure, in atmospheres:

ANSWER: 6

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(Solution: $P_1V_1 = P_2V_2$; $(1.5atm)(8L) = (P_2)(2L)$; = 6atm) Mytitute 新春 株 该 % Milital Market & PR Mylitate At 18 18

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3) PHYSICS Short Answer For two objects separated by a distance d, if the mass of one of the objects increases by two times, by what factor will the gravitational attraction between them increase?

ANSWER: TWO (ACCEPT: 2 TIMES)

BONUS

3) PHYSICS Short Answer Assuming air resistance is negligible and the gravitational acceleration is 10 meters per second squared, what is the distance traveled, in meters, by a body in free fall after 4 seconds if it started from rest? Whiting the state of the state

ANSWER: 80 METERS

Y.

Y.

Y.

Y.

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Y.

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Y.

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TOSS-UP

4) ASTRONOMY *Multiple Choice* The lunar maria are:

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- W) composed of granite
- X) less than one billion years old
- Y) between three and four billion years old
- Z) older than the lunar highlands

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ANSWER: Y) BETWEEN THREE AND FOUR BILLION YEARS OLD

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4) ASTRONOMY *Short Answer* Based on what three physical properties do astronomers divide Maritule Mark of Sept. 18 18. Militate At 18 18 the planets into terrestrial and Jovian:

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ANSWER: MASS, SIZE, AND DENSITY

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5) MATH Short Answer What German mathematician in 1865 cut a long rectangular strip of paper, gave the paper a half-twist, and pasted the ends together, to show that a sheet can have only one side?

ANSWER: AUGUSTUS MOBIUS (ACCEPT: MOBIUS)

BONUS

5) MATH Short Answer In a triangle ABC, angle $A = 55^{\circ}$ and angle $B = 70^{\circ}$. If line segment AB = 3x - 2 and line segment BC = x + 10, what is the value of x?

ANSWER: 6

(Solution: Isosceles, thus: AB = BC; 3x - 2 = x + 10; x = 6)

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TOSS-UP

- 6) EARTH SCIENCE *Multiple Choice* Portions of the Ogallala aquifer are located under:
 - W) Nebraska

Y.

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Y.

- X) the San Jaoquin valley
- Y) Arizona
- Z) Florida

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ANSWER: W) NEBRASKA

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BONUS

6) EARTH SCIENCE Short Answer The seismic discontinuity that marks the base of the crust of the Earth is known as the what?

ANSWER: MOHO (ACCEPT: M-DISCONTINUITY OR MOHOROIVICIC DISCONTINUITY)

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- 7) GENERAL SCIENCE Multiple Choice Because of its enhanced capacity to refract light, which glass formula is most suitable for making lenses and prisms, as well as for imitation jewels:
- W) soda-lime
- X) potassium silicate
- Y) borosilicate
- Z) lead

Y.

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ANSWER: Z) LEAD

BONUS

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7) GENERAL SCIENCE Short Answer What is the general term for the process by which glass is strengthened, which involves reheating the glass until it almost softens are delicated to the process of the strength of of the strengt uniformly cooling it again, causing it to go into extreme compression?

ANSWER: TEMPERING

TOSS-UP

- 8) COMPUTER SCIENCE Multiple Choice The allowing of long file names was a primary difference between: Mariante stat state of the Militally And At 18 18
- W) DOS and Windows 3.11
 X) Windows 3.11 X) Windows 3.11 and Windows for Workgroups
 Y) Windows 3.11 and Windows 67

 - Z) Windows 95 and Windows 98

ANSWER: Y) WINDOWS 3.11 AND WINDOWS 95

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BONUS

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- 8) COMPUTER SCIENCE Multiple Choice In Windows 98, long file names can be up to how many characters long: Asitute the the is the Millan Mark is 1980 Mylitute Star At '8 18 Mylithin Mark 18 18
- W) 35
- X) 75
 - Y) 100
 - Z) 255

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Milling 新洲 · 達 序 ANSWER: Z) 255 Misitute ## 18

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9) BIOLOGY Short Answer The oval window is directly stimulated by the vibrations of what bone?

ANSWER: STAPES

Y.

Y.

Y.

1

Y.

10

1

Y.

Y.

BONUS

9) BIOLOGY Short Answer Hair is mostly composed of what protein?

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ANSWER: KERATIN

- 10) CHEMISTRY Multiple Choice Hydrogen bonding is due to a combination of forces, the most important of which is what type of interaction:

- X) dipole-induced dipole
 Y) induced dipole Y) induced dipole-induced Z) induced

ANSWER: W) DIPOLE-DIPOLE

BONUS

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- 10) CHEMISTRY Multiple Choice Which of the following compounds contains a coordinate covalent bond:
- W) NH₄⁺
- $X) N_2H_4$
- Y) N₂

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Z) NH₃

ANSWER: W) NH₄⁺ Millinin 教教教·蒙然 Milling 新洲 接際

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阿利川州 教 华·溪 11) PHYSICS Short Answer What is the most common name for the magnetic fusion confinement system first developed in the USSR that has the shape of a toroid?

ANSWER: TOKAMAK

Y.

Y.

Y.

Y.

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BONUS 18

11) PHYSICS Short Answer In 1995, two scientists from the University of Colorado created what new state of matter that would lead to their winning of a Nobel prize:

ANSWER: BOSE-EINSTEIN CONDENSATE (ACCEPT: BEC)

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TOSS-UP

- 12) ASTRONOMY Multiple Choice What is the most common name for the pattern found etched on samples of iron meteorites? Marithus 教育教士等序系 Muliture ## # 13 PR Misitally 教教教·蒙豫
- W) Widmanstätten pattern
 X) Rhombio pott

 - Y) Halley's pattern
 - Z) Chondritic Rhombite pattern

ANSWER: W) WIDMANSTÄTTEN PATTERN

BONUS

12) ASTRONOMY Short Answer If the sidereal period "P" of a planet is measured in years, and the semi-major axis of the planet's elliptical orbit, "a", is measured in astronomical units, then the equation governing the planet's motion given by the formula, $P^2 = a^3$, is best known as what law?

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ANSWER: KEPLER'S THIRD LAW

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- 13) MATH *Multiple Choice* A parallelogram whose adjacent sides are unequal is called a:
- W) rhombus
- X) rhomboid
- Y) deltoid

W.

Y.

Y.

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Z) rectangle

ANSWER: X) RHOMBOID

BONUS

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13) MATH Short Answer Use the Binomial Theorem to expand and simplify the following equation: $(x-1)^4$

ANSWER: $x^4 - 4x^3 + 6x^2 - 4x + 1$

- 14) EARTH SCIENCE Multiple Choice What type of seismic wave causes the most damage during an earthquake:
- W) shear
- Y) expansional
 Z) surface X) compressional

ANSWER: Z) SURFACE

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14) EARTH SCIENCE Short Answer What scale is based on the amount of vibration felt by people during low-magnitude earthquakes and the extent of building damage during high magnitude earthquakes?

ANSWER: MODIFIED MERCALLI SCALE (ACCEPT: MERCALLI) Marithus Mark 3

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- 15) GENERAL SCIENCE Multiple Choice The leaf of the Sugar Maple tree is considered to be:
- W) palmately lobed
- X) palmately compound
- Y) pinnately lobed
- Z) pinnately compound

ANSWER: W) PALMATELY LOBED

BONUS

- 15) GENERAL SCIENCE *Multiple Choice* Which of the following is the causative agent for chicken pox:
 - W) Bordetella pertussis
 - X) Varicella-zoster
 - Y) Variolla-zoster

Y.

1

1

1

Y.

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Z) Vermicelli pertussis

ANSWER: X) VARICELLA-ZOSTER

TOSS-UP

- 16) COMPUTER SCIENCE *Multiple Choice* Resetting a computer that is already turned on to its initial state whereby any data or programs in main memory are erased is called a:
 - W) clean boot
 - X) cold boot
 - Y) warm boot
 - Z) hot boot

ANSWER: Y) WARM BOOT

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16) COMPUTER SCIENCE *Short Answer* What does the acronym for the JPEG graphics file format stand for?

ANSWER: JOINT PHOTOGRAPHIC EXPERTS GROUP

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17) BIOLOGY *Short Answer* In what specific part of the uterus does implantation normally occur?

ANSWER: ENDOMETRIUM

Y.

Y.

Y.

Y.

10

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Y.

Y.

BONUS

17) BIOLOGY *Short Answer* What is the most common name for a molecule of glycerol with all three hydroxyl groups esterified to fatty acids?

ANSWER: TRIGLYCERIDE

TOSS-UP

- 18) CHEMISTRY Multiple Choice The IUPAC name 1,4-dimethylcyclohexane is an example of which of the following:
- W) cyclic alkane
- X) branched alkane
 Y) straight Y) straight chain alkane
 - Z) haloalkane (pronounced: HAL-o-alkane)

ANSWER: W) CYCLIC ALKANE

BONUS

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- 18) CHEMISTRY Multiple Choice Which of the following solutions are miscible:
- W) carbon tetrachloride and water
- X) oil and water

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Y) carbon tetrachloride and octane

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Z) octane and water

ANSWER: Y) CARBON TETRACHLORIDE AND OCTANE

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19) PHYSICS Short Answer What is the common commercial unit of energy equal to 3,600,000 joules:

ANSWER: KILOWATT HOUR

BONUS

- 19) PHYSICS Multiple Choice Which of the following types of prisms was developed for obtaining interference between 2 sections of a wave front with diffraction largely eliminated:
- W) Fresnel biprism
- X) Littrow prism Y) Nicol prism
 Z) Bross

Y.

Y.

Y.

Y.

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ANSWER: W) FRESNEL BIPRISM

13 1/2 **TOSS-UP**

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20) ASTRONOMY Short Answer What is the common astronomical name for areas where gravitational attraction of two or more celestial bodies prevents objects in that area from maintaining an orbit, such as the spacings of semi-major axes of orbits of asteroids in the asteroid belt?

ANSWER: KIRKWOOD GAPS

BONUS

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20) ASTRONOMY *Short Answer* What is the name for a lunar ditch where molten lava once Maritale And At 18 1982 Implitute 精神 林 溪 學 flowed?

ANSWER: VOLCANIC RILLE

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21) MATH Short Answer What is the longest chord of a circle also known as?

ANSWER: DIAMETER OF THE CIRCLE (ACCEPT: DIAMETER)

21) MATH *Short Answer* Solve the following equation for *b*: $\frac{(a+b)}{b} = \frac{(c+d)}{d}$ ANSWER: $b = \frac{ad}{d}$

- 22) EARTH SCIENCE Multiple Choice A sharp ridge of erosion-resistant rock formed between adjacent cirque glaciers, often forming a saw-toothed mountain ridge is known as: Mininte 教教教·後序
- W) arête

Y.

Y.

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Y.

1

1

Y.

Y.

- X) scree
- Y) levee
- Z) moraine

ANSWER: W) ARÊTE

BONUS

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- 22) EARTH SCIENCE Multiple Choice Two common igneous rocks derived from andesitic magma are: Molitule At 18 18 Molitule ## # 18 18 Militale Market 18 18
- y) komatite and rhyolite
 Z) rhyolite and kimber!:
- X) diorite and andesite
 Y) kometit

ANSWER: X) DIORITE AND ANDESITE Marithus 新春春·養 學 TIMITHE THE STATE OF THE STATE

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23) BIOLOGY Short Answer What is the predominant immunoglobulin class found in human

ANSWER: IgA

Y.

Y.

Y.

Y.

Y.

Y.

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Y.

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BONUS

- 23) BIOLOGY *Multiple Choice* Which of the following vitamins is NOT properly matched with one of its major symptoms of deficiency:
- W) vitamin C and bleeding of gums
- Y) vitamin A and night blindness
 Z) vitamin B-1 and not X) vitamin D and poor bone structure

ANSWER: Z) VITAMIN B-1 AND PELLAGRA

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13 1/2 **TOSS-UP**

- 24) CHEMISTRY Multiple Choice Which of the following polymers is the first man-made polymer:
- X) Teflon
- Y) bakelite (X) cellul

ANSWER: Y) BAKELITE

BONUS

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24) CHEMISTRY Short Answer The change in enthalpy, ΔH, (read as: delta H), is to a calorimeter as the change in internal energy, ΔE , (read as: delta E), is to what?

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ANSWER: BOMB CALORIMETER The think the state of the stat

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Marithle Mar of 18 25) PHYSICS Short Answer According to quantum chromodynamics, what is the name for the particle that transmits the color charge?

ANSWER: GLUON

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Y.

Y.

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Y.

Y.

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BONUS

mylithe ## # 13 PR 25) PHYSICS Short Answer What is the kinetic energy, in Joules, of a 50 Kilogram person who is moving at 5 meters per second?

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ANSWER: 625

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(Solution: KE = $\frac{1}{2}$ mv² = $\frac{1}{2}$ (50)(5)² = 625 Joules)

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