ROUND 7

TOSS-UP

- Mytitute ## # '& PR 1) PHYSICAL SCIENCE Multiple Choice Which of the following laws most directly limits the ability of a simple machine to an efficiency of 100% or lower: Moritally Market 18 180
 - W) Hooke's law
 - X) law of equal proportions
 V) the final
 - Y) the first law of motion
 - Z) the law of conservation of energy

ANSWER: Z) THE LAW OF CONSERVATION OF ENERGY

BONUS

1) PHYSICAL SCIENCE Short Answer To the first decimal place, what is the ideal mechanical advantage of a lever with a resistance arm of 200 centimeters and an effort arm of 3.4 meters?

ANSWER: 1.7

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(Solution: MA = EA/RA = 340/200 = 1.7)

TOSS-UP

- 2) EARTH SCIENCE Multiple Choice Which of the following characteristics is most commonly associated with a tsunami wave as opposed to a normal ocean wave in the open ocean:
 - W) period of 5 seconds
 - X) wavelength of 300 miles
 - Y) speed of 50 miles per hour
 - Z) motion of only the uppermost layer of water

ANSWER: X) WAVELENGTH OF 300 MILES

BONUS

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- 2) EARTH SCIENCE Multiple Choice Which of the following is a true tidal wave:
- W) tsunami
- X) tidal bore
- Y) rip current
- Z) tidal range

ANSWER: X) TIDAL BORE

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3) MATH Short Answer Divide x^5 by x^3 and simplify:

ANSWER: x^2

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BONUS

3) MATH *Short Answer* Evaluate the following and give your answer as a mixed fraction in lowest terms: $9\frac{1}{2} - 5\frac{2}{5}$

ANSWER: $4\frac{1}{10}$

TOSS-UP

- 4) GENERAL SCIENCE *Multiple Choice* Which of the following does the prefix endo (spell out the letters e, n, d, o) mean, as in the word endoscope:
- W) under
- X) dark
- Y) inside
- Z) invisible

ANSWER: Y) INSIDE

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BONUS

4) GENERAL SCIENCE *Short Answer* Arrange the following 3 choices in order of INCREASING speed: 3 feet per minute; 5 yards per minute; 30 yards per hour

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ANSWER: 30 YARDS PER HOUR; 3 FEET PER MINUTE; 5 YARDS PER MINUTE

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- 5) LIFE SCIENCE *Multiple Choice* Which of the following anatomical structures do sharks NOT possess:
- W) gill covers or opercula
- X) lateral lines
- Y) cartilaginous skeletons
- Z) livers

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ANSWER: W) GILL COVERS OR OPERCULA

BONUS

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5) LIFE SCIENCE *Short Answer* What scientist is sometimes considered the father of genetics because of his extensive studies on the patterns of inheritance?

ANSWER: GREGOR MENDEL (ACCEPT: MENDEL)

TOSS-UP

- 6) PHYSICAL SCIENCE *Multiple Choice* What is the mass of an electron:
- W) about the same as a proton
- X) about ½ as much as a proton
- Y) about $1/1,800^{th}$ of a proton
- Z) electrons have no mass

ANSWER: Y) ABOUT 1/1,800TH OF A PROTON

BONUS

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6) PHYSICAL SCIENCE *Short Answer* A 10,000-newton car is on the top floor of a parking garage 25 meters above the ground. Relative to the ground, what is the gravitational potential energy, in joules, of the car?

ANSWER: 250,000 (ACCEPT: 2.5×10^5)

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(Solution: $PS = 10,000 \text{ N} \times 25 \text{ m} = 250,000 \text{ J}$)

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- 7) EARTH SCIENCE Multiple Choice Streams running off the terminus of glaciers have a high bed load and easily erodible banks, typically forming which of the following types of stream patterns:
- W) meandering
- X) oxbow

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- Y) braided Z) back swamp

ANSWER: X) BRAIDED

BONUS 1/4

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Maitute start 7) EARTH SCIENCE Multiple Choice Which of the following is similar to a delta but forms when a steep mountain stream spreads out from a mountain canyon onto a flat, broad valley:

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- W) alluvial fan
- X) levee
- Y) playa Z) flood plain

ANSWER: W) ALLUVIAL FAN

TOSS-UP

8) MATH Short Answer Solve the following equation for x: 15x + 8x - 3x = 120

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ANSWER: 6

BONUS

Milital 精 社 接 % 8) MATH Short Answer Divide $\frac{5}{9}$ by $\frac{3}{5}$ and give your answer as a proper fraction in lowest terms:

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ANSWER: $\frac{25}{27}$

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Militate An	9) GENERAL SCIENCE called the Newton:	Multiple Choice	Which of the fol	lowing BEST	describes the S	I unit

W) a unit of power

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X) a unit of force

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- Z) a unit of work

ANSWER: X) A UNIT OF FORCE

BONUS

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9) GENERAL SCIENCE *Short Answer* Rounded to the nearest whole number, how many meters per second is equal to 40 kilometers per hour?

ANSWER: 11

TOSS-UP

Matinta Mar 14 18 1980 10) LIFE SCIENCE Short Answer How many phalanges are in a human thumb?

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ANSWER: 2

BONUS

10) LIFE SCIENCE Multiple Choice Which of the following terms is most often used to describe a biochemical reaction where the forward reaction is at the same rate as the reverse reaction:

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- W) isothermic
- X) isotropic
- Y) equilibrium
- Z) homeotropic

ANSWER: Y) EQUILIBRIUM Milling 素素 養 家 Military Market & P. S. Militate A H W

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- 11) PHYSICAL SCIENCE Multiple Choice Alkali metals all have the same:
- W) number of electrons in their outer shells
- X) atomic radii
- Y) electronegativities
- Z) melting points

ANSWER: W) NUMBER OF ELECTRONS IN THEIR OUTER SHELLS

BONUS

- 11) PHYSICAL SCIENCE *Multiple Choice* Which of the following liquids at room temperature and 1 atmosphere would have the GREATEST surface tension:
 - W) distilled water
 - X) ethanol
 - Y) methanol
 - Z) acetone

ANSWER: W) DISTILLED WATER

TOSS-UP

- 12) EARTH SCIENCE *Multiple Choice* Which of the following most likely formed a U-shaped valley:
 - W) glacial erosion
 - X) mountain stream erosion
 - Y) wind erosion
 - Z) deforestation

ANSWER: W) GLACIAL EROSION

BONUS

- 12) EARTH SCIENCE *Multiple Choice* Which of the following gives glacial meltwater a quality which is commonly described as glacial milk:
- W) ice crystals in the water
- X) the abundance of trapped air
- Y) large amounts of suspended material
- Z) the abundance of cyanobacteria

ANSWER: Y) LARGE AMOUNTS OF SUSPENDED MATERIAL

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- 13) MATH Short Answer Name all of the following 3 statements which are always TRUE:
 - 1) a square is a regular polygon
 - 2) an equilateral triangle is equiangular
 - 3) a scalene triangle has 2 sides of equal length

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ANSWER: 1 AND 2

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- 13) MATH *Multiple Choice* Which of the following is evenly divisible by each of the counting Implitute 教育 养 婆 序 Milling 教教 · 養 · 豫 Militally Market 18 180 numbers 1 through 8:

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- W) 360 X) 1,250
 - Y) 1,800
 - Z) 2,520

ANSWER: Z) 2,520

TOSS-UP

- 14) GENERAL SCIENCE Multiple Choice Which of the following instruments consists of a weighted glass tube or bulb, which is floated in a liquid to measure the liquid's relative density:
- W) hydrometer
- X) hypsometer
- Y) densitometer
- Z) sensometer

ANSWER: W) HYDROMETER

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BONUS

14) GENERAL SCIENCE Short Answer Identify each of the following 3 materials as derived from a plant or animal source, respectively: lanolin; silk; jute

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ANSWER: LANOLIN = ANIMAL; SILK = ANIMAL; JUTE = PLANT

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Militate 38	15) LIFE SCIENCE frontal bone found:	Multiple Choice	In which of the following	lowing areas of the	human body is the

- W) pelvis
- X) spine
- Z) head Y) shoulder

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ANSWER: Z) HEAD

BONUS

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15) LIFE SCIENCE *Multiple Choice* In which of the following areas of the human body is the ileum bone found:

- W) pelvis
- X) wrist
- Z) head Y) shoulder

ANSWER: W) PELVIS

16) PHYSICAL SCIENCE Multiple Choice Which of the following chemical formulas gives an indication of the arrangement of atoms and bonds in a chemical compound:

- W) empirical
- X) molecular
- Y) structural
- Z) polyatomic

ANSWER: Y) STRUCTURAL

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16) PHYSICAL SCIENCE Short Answer How many total atoms are in any one molecule of Epsom salts or MaSO. 7H-O (road on Maso). Epsom salts, or MgSO₄•7H₂O (read as: Mg, S, O, 4, dot, 7, H, 2, O)

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ANSWER: 27 Mytitute 新春 株 该 % Ministration of the state of th

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	17) EARTH SCIENCE and is very hard and com		Which of the followi	ng is made of micro	crystalline quartz

- W) gypsum
- X) chalk

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- Z) chert Y) limestone

ANSWER: Z) CHERT

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BONUS

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- 17) EARTH SCIENCE *Multiple Choice* Which of the following is NOT true of geodes:
 - W) they occur in sedimentary and certain volcanic rocks
 - X) they look like ordinary rocks from the outside
 - Y) their exterior is typically made up of limestone
 - Z) they are not found in the U.S.

ANSWER: Z) THEY ARE NOT FOUND IN THE U.S.

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TOSS-UP

18) MATH *Short Answer* Give the numerical value of 8 factorial divided by 8 factorial:

ANSWER: 1

ANSWER: 1

BONUS

18) MATH Short Answer Evaluate the following expression: 10 + [8 + (2 - 10)] (read as: 10 plus, open bracket, 8 plus, open parenthesis, 2 minus 10, close parenthesis, close bracket)

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ANSWER: 10

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- 19) GENERAL SCIENCE *Multiple Choice* Which of the following is the study of bees:
- W) herpetology
- X) apiology

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- Y) ichthyology
- Z) ornithology

ANSWER: X) APIOLOGY

BONUS

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- meters, of a person who is 4 feet and 11 inches tall: 19) GENERAL SCIENCE Multiple Choice Which of the following is CLOSEST to the height, in
 - W) 1.2
 - X) 1.5
 - Y) 1.8
 - Z) 2.2

ANSWER: X) 1.5

(Solution: (59 in)(2.54 cm/in)(1 m/100 cm) = 1.49 m)

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TOSS-UP

20) LIFE SCIENCE Short Answer In what organelle do parenchymal (read as: PAR-en-KYM-al) cells store most of a plant's cellular fluid?

ANSWER: VACUOLE

BONUS

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20) LIFE SCIENCE Short Answer Name all of the following 3 groups of plants that have no xylem: mosses; ferns; conifers Mylithin the the light of the Militate ## # 18 18 Willing the 14 18 18 Majituto ** ** **

ANSWER: MOSSES

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- 21) PHYSICAL SCIENCE Multiple Choice Which of the following is generally NOT true:
- W) the boiling point of water decreases with increased altitude on Earth
- X) the melting point of table salt is much higher than that of glucose
- Y) radon is radioactive

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Z) metals react with nonmetals to form new metals

ANSWER: Z) METALS REACT WITH NONMETALS TO FORM NEW METALS

BONUS

21) PHYSICAL SCIENCE Short Answer What is the percent efficiency, rounded to the nearest whole number, of a simple machine that requires 600 joules of energy input to achieve 400 joules of energy output?

ANSWER: 67

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(Solution: $400/600 = 0.67 \times 100 = 67\%$)

TOSS-UP

- 22) EARTH SCIENCE *Multiple Choice* Which of the following most likely made the trip from ON ST HE WHITEIN 加度游戏学家 Militate ## # '\$ Europe to the New World possible for early sailors:
- W) the westerlies
- X) the trade winds
- Y) the doldrums
- Z) the jet stream

ANSWER: X) THE TRADE WINDS

BONUS

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- 22) EARTH SCIENCE Multiple Choice Which of the following is a dark gray, low cloud Mylithin the 14 18 180 **阿尔**斯斯 茶 茶 溪 溪 Printy Mark & Mr. associated with continuous falling rain:
- W) altocumulus
 - X) stratocumulus
 - Y) cumulus humilis
 - Z) nimbostratus

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ANSWER: Z) NIMBOSTRATUS

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TOSS-UP

23) MATH Short Answer Evaluate
$$\frac{x}{y}$$
 when $x = 0$ and $y = -8$:

ANSWER: 0

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Y.

BONUS

Maritule Mar 14 3 23) MATH Short Answer Jill has \$2.25 consisting of U.S. dimes and quarters. If she has 5 more dimes than quarters, how many dimes and quarters, respectively, does she have?

ANSWER: DIMES = 10; QUARTERS = 5

TOSS-UP

24) GENERAL SCIENCE Short Answer What is the common term for the most accepted theory on how the universe came into being?

ANSWER: BIG BANG

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BONUS

24) GENERAL SCIENCE Short Answer What letter is most often used by scientists as a symbol for light or the speed of light?

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ANSWER: C

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Matinta Mar At ' 18 180 25) LIFE SCIENCE Short Answer What glands of the human body are most responsible for producing what is sometimes called the stress hormone cortisol?

ANSWER: ADRENALS (ACCEPT: ADRENAL CORTEX)

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BONUS

Marithe Mar H 13 198 25) LIFE SCIENCE Short Answer Name all of the following 3 choices that are common functions of feethers are higher than the state of th of feathers on birds: thermal insulation; sexual selection; flight

Milital Mar No. 18 18. Implitute 教教 林·溪 學 Marith Mar H & PR Mylithin Mar At 13 198 ANSWER: ALL Malitule Market 18 1 Matitude Mar At 12 198 Matitud Mar ph ' 18 PR Matitude Market & PR Marithe Mar No. 18 18 Implitute 素素 接 % Implitute 素素 ·養 序》 Marithus Mar # 18 180 Milital Market & PR Mytitute ## # 18 PR Matitude Mar No. 18 18 Implitute 素素 接 「% Marithus Mar # 18 180 Implitute 教教教·婆然 Mytitute ## # 18 PR Mytithe Market & PR Myithin 教教教·蒙然 Marithus Mar # 18 180 Millinin 教教教·蒙然 Milling 教教教學 Matinta An At & PR Militin 教教教·蒙豫 Matitude # 14 18 motivite # 14 18 Molitule ## # 18 18 Militate And At 18 18