

1. What is the most common term for the energy an object has because of its position or configuration?

ANSWER: POTENTIAL

2. Which one of the four basic forces of the universe is most directly involved with maintaining the planets in their orbits?

ANSWER: GRAVITY

3. Based on size and location, which of the 2 basic types of glaciers dominates Greenland today?

ANSWER: CONTINENTAL (ACCEPT: ICE SHEET)

4. Which of the following fossils is the oldest:

W) trilobite

X) snake

Y) petrified wood

Z) megalodon tooth

ANSWER: W) TRILOBITE

5. What is the measure, in degrees, of each angle in an equilateral triangle?

ANSWER: 60 (ACCEPT: 60, 60, 60)

6. Which of the following can sometimes result after a moderate to severe blow to the head:

X) meningitis

Y) impetigo

Z) concussion

ANSWER: Z) CONCUSSION

7. What is the year of a person's death who was born in the year 580 BC and lived 63 years?

ANSWER: 517 BC (ACCEPT: 517)

8. How many limbs are tetrapods typically considered to have?

ANSWER: 4

9. Which of the following is the most common source of energy for brain cells in humans:

W) nucleic acids

X) proteins

Y) glucose

Z) pectins

ANSWER: Y) GLUCOSE

10. What is the most common term for the ratio of the output force to the input force of a simple machine?

ANSWER: MECHANICAL ADVANTAGE (ACCEPT: ACTUAL MECHANICAL ADVANTAGE)

11. Which of the following most directly contributes to the actual mechanical advantage always being less than the ideal mechanical advantage:

W) the basic design of any machine

X) friction

Y) how simple machines are combined

Z) the input distance always being less than the output distance

ANSWER: X) FRICTION

12. Which of the following is NOT a mineral:

W) quartz

X) topaz

Y) basalt

Z) diamond

ANSWER: Y) BASALT

13. Which of the following is the hottest region of planet Earth:

W) the mantle

X) the inner core

Y) the outer core

Z) the crust

ANSWER: X) THE INNER CORE

14. What is the kelvin temperature that represents a condition of no molecular motion?

ANSWER: 0 (ACCEPT: ABSOLUTE ZERO)

15. How many grams are in 1 metric ton?

ANSWER: 1 MILLION (ACCEPT:  $1 \times 10^6$ )

16. What is the ultimate energy source for nearly all life on Earth?

ANSWER: THE SUN

17. What is the environmental factor most directly involved in phototropism?

ANSWER: LIGHT (ACCEPT: SUNLIGHT or SUN)

18. If a chimpanzee were to throw darts at a Periodic Table, he would most likely hit an element with which of the following characteristics:

- W) a naturally radioactive element
  - X) a solid at room temperature
  - Y) a gas at room temperature
  - Z) a liquid at room temperature
- ANSWER: X) A SOLID AT ROOM TEMPERATURE

19. Which of the following has the most inertia:

- W) 1 kilogram of iron
  - X) 2 kilograms of flour
  - Y) 5 newtons of iron
  - Z) 4 kilograms of iron
- ANSWER: Z) 4 KILOGRAMS OF IRON

20. Which of the following is the BEST example of the chemical weathering of rock:

- W) cracking of rock by plant roots
  - X) rain percolating through limestone
  - Y) frost action
  - Z) abrasion
- ANSWER: X) RAIN PERCOLATING THROUGH LIMESTONE

21. What is the name for the "river" of high altitude wind over North America that marks the southern boundary between polar air to the north and warmer air to the south?

ANSWER: POLAR JET STREAM (ACCEPT: JET STREAM)

22. MATH Multiple Choice Minuends and subtrahends are used in which of the following mathematical operations:

- W) addition
  - X) subtraction
  - Y) multiplication
  - Z) division
- ANSWER: X) SUBTRACTION

23. What is the general name for a plastic material composed of a polymer of styrene?

ANSWER: POLYSTYRENE (ACCEPT: STYROFOAM)

24. Which of the following is a product found in most toothpastes for the purpose of making the teeth more resistant to decay by promoting remineralization:

- W) fluoride
- X) melamine
- Y) titanium dioxide

Z) diethylene glycol  
ANSWER: W) FLUORIDE

25. What is the scientific name of the human windpipe?

ANSWER: TRACHEA

26. The organ of Corti is directly involved in what human sense?

ANSWER: HEARING

27. Which of the following is TRUE regarding mixing pigments?

W) violet is typically considered a primary color for pigments  
X) only primary pigment colors can be mixed to give other colors  
Y) as more pigments are mixed, the darker the resulting mixture becomes  
Z) magenta and cyan are complementary pigment colors  
ANSWER: Y) AS MORE PIGMENTS ARE MIXED, THE DARKER THE RESULTING MIXTURE BECOMES

28. What color will a red colored object appear to a human if it is illuminated by a red light?

ANSWER: RED

29. Which of the following is often the LEAST reliable property of a mineral that is used in mineral identification:

W) magnetism  
X) specific gravity  
Y) color  
Z) cleavage  
ANSWER: Y) COLOR

30. Which of the following terms best describes the streak of a mineral?

W) wavy  
X) tabular  
Y) translucent  
Z) brown  
ANSWER: Z) BROWN

31. What is the identity element for addition on the integers?

ANSWER: 0

32. The sum of two numbers is 16 and their product is 55. What are the two numbers?

ANSWER: 11; 5 (in any order)

33. Which of the following best describes a smaller stream that merges with a larger stream?

- W) delta
- X) rip-rap
- Y) streamer
- Z) tributary

ANSWER: Z) TRIBUTARY

34. Which of the following is a structural adaptation of ducks that is most helpful in keeping them dry?

- W) an oil-producing gland
- X) hollow fur
- Y) darkly colored plumage
- Z) ability to float

ANSWER: W) AN OIL-PRODUCING GLAND

35. Which of the following is the closest synonym for motile?

- W) having a motor
- X) using energy
- Y) able to move
- Z) living in water

ANSWER: Y) ABLE TO MOVE

36. Which of the following terms is used by microbiologists for a bacterium with a rod shape?

- W) tubular
- X) bacillus
- Y) trichome
- Z) cylindrical

ANSWER: X) BACILLUS

37. What nucleon balances the charge of electrons to give an atom a neutral state?

ANSWER: PROTON(S)

38. Nitrogen has 7 protons. What is the atomic mass of its common isotope, rounded to the nearest whole number?

ANSWER: 14

39. What molecular substance is believed to be the most basic requirement or signature for life to exist on a planet?

ANSWER: WATER (ACCEPT: H<sub>2</sub>O)

40. What planets are able to pass between the Earth and the Sun?

ANSWER: MERCURY; VENUS

41. The lead-acid battery is most commonly found in:

W) automobiles

X) cell phones

Y) flashlights

Z) laptop computers

ANSWER: W) AUTOMOBILES

42. From what biological polymer is paper primarily composed?

ANSWER: CELLULOSE

43. What is the common name of the members of the Class Aves?

ANSWER: BIRDS

44. Name all of the following 3 groups of animals that are vertebrates: amphibians; reptiles; gastropods

ANSWER: AMPHIBIANS; REPTILES

45. Which of the following is a coastal morphology most characteristic of the west coast of the U.S.?

W) numerous estuaries

X) depositional coast

Y) extensive barrier islands

Z) rocky coast with small spits and pocket beaches

ANSWER: Z) ROCKY COAST WITH SMALL SPITS AND POCKET BEACHES

46. Which of the following best describes how a sedimentary rock can form?

W) compaction and cementation

X) slow cooling and hardening of magma

Y) fast cooling and hardening of magma

Z) high temperature and pressure causing recrystallization

ANSWER: W) COMPACTION AND CEMENTATION

47. Which of the following does the prefix "ambi" (spell out the letters a, m, b, i) mean, as in the word ambidextrous:

W) equal

X) both

Y) neither

Z) always

ANSWER: X) BOTH

48. Arrange the following 4 choices from the one with the LOWEST mass to the HIGHEST mass:  
decigram; microgram; centigram; hectogram

ANSWER: MICROGRAM; CENTIGRAM; DECIGRAM; HECTOGRAM

49. What is the most common term for the biological polymer found in chromosomes that stores genetic information?

ANSWER: DNA (ACCEPT: DEOXYRIBONUCLEIC ACID)

50. Inside what human cell organelle does replication of the chromosomal DNA in preparation for mitosis occur?

ANSWER: NUCLEUS

51. What is the mass, in grams to the nearest whole number, of one cubic centimeter of pure water at standard temperature and pressure?

ANSWER: 1

52. Name all of the following 3 choices that a physicist would consider to be simple machines: bicycle; lever; ramp

ANSWER: LEVER; RAMP

53. The greatest geophysical impacts from the movement of Earth's lithospheric plates are most often seen and felt in which of the following areas:

W) at the center of the plates

X) at plate boundaries

Y) evenly distributed throughout the entire plate

Z) along riverbeds within the plates

ANSWER: X) AT PLATE BOUNDARIES

54. What layer of Earth's interior contains over 60% of the Earth's mass and is composed of iron- and magnesium-rich silicates?

ANSWER: MANTLE

55. One quintillion contains how many zeroes?

ANSWER: 18

56. What specific structure is most directly responsible for the motility of bacteria?

ANSWER: FLAGELLA (ACCEPT: FLAGELLUM)

57. Which of the following BEST describes how the SI unit called the Newton is derived:?

W) the product of force times time

X) the energy in one kilogram traveling at one meter per second

Y) the force needed to accelerate 1 kilogram at one meter per second squared

Z) the power needed to accelerate 1 kilogram at one kilometer per hour

ANSWER: Y) THE FORCE NEEDED TO ACCELERATE 1 KILOGRAM AT ONE METER PER SECOND SQUARED

58. The best evidence for the model of Earth's interior comes from the study of:

W) seismology

X) paleontology

Y) paleomagnetism

Z) glaciology

ANSWER: W) SEISMOLOGY

59. Which of the following is TRUE of the Richter Scale:

W) values are always given in whole numbers

X) an earthquake measuring 5 has 50-times more energy than an earthquake measuring 4

Y) it is based on a scale of 0 to 14

Z) it is based on a logarithmic scale

ANSWER: Z) IT IS BASED ON A LOGARITHMIC SCALE

60. In the real numbers, a number times its multiplicative inverse equals what?

ANSWER: 1

61. What hard silvery-grey metal is the 9th most common element in the Earth's crust, has an atomic number of 22, and takes its name from the Titans?

ANSWER: TITANIUM

62. What is the most common term for the symbiotic relationship where one organism benefits and the other is harmed?

ANSWER: PARASITISM

63. What is the most common term for the type of symbiosis where one organism benefits and the other is neither significantly harmed nor helped by the interaction?

ANSWER: COMMENSALISM

64. When using the periodic chart, what number gives the number of protons in a given element?

W) period number

X) group number

Y) atomic number

Z) average atomic mass

ANSWER: Y) ATOMIC NUMBER

65. Which of the following is NOT true:

- W) compounds have atoms from more than one element
- X) atoms can bond together to make molecules
- Y) all helium atoms have one more proton than all hydrogen atoms
- Z) all oxygen molecules have 8 neutrons

ANSWER: Z) ALL OXYGEN MOLECULES HAVE 8 NEUTRONS

66. Most blizzards that strike the continental U.S. most directly originated in which of the following locations:

- W) the Gulf of Alaska
- X) the Gulf of Mexico
- Y) along the Gulf Stream
- Z) in the North Sea

ANSWER: W) THE GULF OF ALASKA

67. What terrestrial planet rotates in an opposite direction to the planet Earth?

ANSWER: VENUS

68. What is the mathematical term for coplanar lines that never intersect?

ANSWER: PARALLEL

69. Which of the following types of maps would be most useful on a hiking trip through the Alps:

- W) synoptic
- X) topographic
- Y) planimetric
- Z) Mercator projection

ANSWER: X) TOPOGRAPHIC

70. Regarding computer technology, which of the following BEST describes the bit:

- W) an analogue magnetic storage sequence
- X) a computer processor
- Y) a memory value of 1 through 8
- Z) a binary digit that stores information

ANSWER: Z) A BINARY DIGIT THAT STORES INFORMATION

71. What is the scientific term for the biting structures of spiders?

ANSWER: CHELICERAE (ACCEPT: CHELICERA)

72. In what structure of a nucleated cell are ribosomes assembled into their subunits?

ANSWER: NUCLEOLUS (DO NOT ACCEPT: NUCLEUS)

73. If the angle of incidence for a beam of light on a mirror is 27 degrees, what is the angle of reflection, in degrees?

ANSWER: 27

74. Which of the following is TRUE of gases:

- W) they have a definite shape
- X) they are highly compressible
- Y) they behave like a fluid
- Z) their particles are in uniform motion

ANSWER: X) THEY ARE HIGHLY COMPRESSIBLE

75. Which of the following terms best describes the cleavage of a mineral?

- W) silky
- X) brittle
- Y) perfect one way
- Z) sub-metallic

ANSWER: Y) PERFECT ONE WAY

76. Which of the following is a region of Earth's atmosphere where convection is most likely to take place?

- W) troposphere
- X) stratosphere
- Y) tropopause
- Z) thermosphere

ANSWER: W) TROPOSPHERE

77. What is the most common element in most steel?

ANSWER: IRON

78. Stainless steel is differentiated from other steels based mainly on the content of what element?

ANSWER: CHROMIUM

79. The human body is most commonly described as having what type of symmetry?

ANSWER: BILATERAL

80. Which of the following BEST explains why a concrete floor feels colder than a wooden floor if both are at 21°C:

- W) wood is not as dense as concrete
- X) concrete conducts heat better than wood
- Y) wood is alive and concrete is not
- Z) concrete is much less elastic than wood

ANSWER: X) CONCRETE CONDUCTS HEAT BETTER THAN WOOD

81. Molasses flows more slowly than water. What is the most common scientific term for the ability of different substances to flow more or less freely?

ANSWER: VISCOSITY

82. Which of the following is NOT true:

- W) an irrational number is one that cannot be expressed as the ratio of integers
- X) fractions equal to 1 are called mixed fractions
- Y) the numerator is less than the denominator in a proper fraction
- Z) a composite number is a positive integer greater than 1 that is not prime

ANSWER: X) FRACTIONS EQUAL TO 1 ARE CALLED MIXED FRACTIONS

83. Rounded to the nearest whole number, what is the specific gravity of water at standard temperature and pressure?

ANSWER: 1

84. An empty plastic soda bottle is closed tightly at an elevation of 10,000 feet elevation and brought back to sea level. What is the visible condition of the bottle?

ANSWER: IT IS CRUSHED (ACCEPT: COLLAPSED OR ANY OTHER REASONABLE SYNONYM)

85. Name all of the following 3 choices that are physical properties of an object: length; mass; density

ANSWER: ALL

86. A mangrove coast is likely to be found in which of the following locations:

- W) Alaskan Peninsula
- X) Hawaiian Islands
- Y) Florida
- Z) Maine

ANSWER: Y) FLORIDA

87. Which of the following is most important for climate because it transports large amounts of heat and moisture from the ocean to land?

- W) tides
- X) monsoons

Y) longshore drift  
Z) erosion  
ANSWER: X) MONSOONS

88. Rounded to the nearest whole number, what is absolute zero in degrees Celsius?

ANSWER: -273

89. What anatomical structures in humans function by connecting muscles to bones?

ANSWER: TENDONS

90. What is the light-yellow fluid that makes up the fluid portion of normal circulating human blood?

ANSWER: PLASMA (DO NOT ACCEPT: SERUM)

91. A screw driver and a doorknob are considered variations of what simple machine?

ANSWER: WHEEL AND AXLE

92. Consider a lever with an ideal mechanical advantage of 8. What will its mechanical advantage be if the effort arm length is reduced by  $\frac{1}{2}$ ?

ANSWER: 4

93. Bioluminescence in marine organisms is important for all but which of the following functions:

W) attracting prey  
X) communicating with other organisms  
Y) illumination  
Z) buoyancy  
ANSWER: Z) BUOYANCY

94. Magmas that crystallize beneath the Earth's surface form intrusive bodies of igneous rock that are generally known as:

W) pumice  
X) plutons  
Y) tuffs  
Z) breccia  
ANSWER: X) PLUTONS

95. How many numbers from 1 through 30 are multiples of 3?

ANSWER: 10

96. Whereas mass is measured in kilograms, what SI unit is the most common measure of an object's weight?

ANSWER: NEWTON(S)

97. On the earth's surface, which of the following is CLOSEST to the mass of 1,000 pounds?

W) 454 kilograms

X) 2,200 kilograms

Y) 1 ton

Z) 1 kiloton

ANSWER: W) 454 KILOGRAMS

98. Most biological catalysts are:

W) proteins

X) vitamins

Y) carbohydrates

Z) lipids

ANSWER: W) PROTEINS

99. Which of the following best describes a bacteriophage:

W) a bacterial virus

X) a stage in the development of most bacteria

Y) the release of disease-causing bacteria from a host organism

Z) a very small bacteria

ANSWER: W) A BACTERIAL VIRUS

100. Which of the following will occur when an unbalanced force acts on an object?

W) the object will stop

X) the object will lose heat

Y) the object will accelerate

Z) the object will melt

ANSWER: Y) THE OBJECT WILL ACCELERATE

101. Which of the following terms best describes the crystal form of a mineral:

W) tabular

X) fluorescent

Y) metallic

Z) vitreous

ANSWER: W) TABULAR

102. What is the name for the northern-most latitude where the Sun can appear directly overhead?

ANSWER: THE TROPIC OF CANCER (ACCEPT: NORTHERN TROPIC)