

ROUND 2

TOSS-UP

- 1) CHEMISTRY *Multiple Choice* All elements in a given group of the periodic table have similar:
- W) maximum principal quantum number
 - X) maximum angular-momentum quantum number
 - Y) valence-shell electron configuration
 - Z) atomic number

ANSWER: Y) VALENCE-SHELL ELECTRON CONFIGURATION

BONUS

- 1) CHEMISTRY *Short Answer* Name a nonmetal element which is a liquid at room temperature:

ANSWER: BROMINE

TOSS-UP

- 2) PHYSICS *Multiple Choice* Which optical phenomenon explains why the sun appears whitish at the zenith and red near the horizon:
- W) diffraction
 - X) scattering
 - Y) reflection
 - Z) doppler shift

ANSWER: X) SCATTERING

BONUS

- 2) PHYSICS *Short Answer* Who is commonly credited in discovering that the buoyant force of a body immersed in a fluid is equal to the weight of the fluid displaced by that object:

ANSWER: ARCHIMEDES

TOSS-UP

- 3) BIOLOGY *Short Answer* Encephalitis is an inflammation of what organ?

ANSWER: BRAIN

BONUS

- 3) BIOLOGY *Short Answer* In the classical classification of organisms, three of the five Kingdoms are Protista, Fungi, and Monera. What are the other two?

ANSWER: ANAMALIA, PLANTAE (Pron: plant-a-ee)

TOSS-UP

- 4) ASTRONOMY *Multiple Choice* If Venus is between the Earth and the Sun, what configuration is it in:

- W) inferior conjunction
- X) superior conjunction
- Y) quadrature
- Z) inferior quadrature

ANSWER: W) INFERIOR CONJUNCTION

BONUS

- 4) ASTRONOMY *Multiple Choice* Near the end of its life, the Sun will do which of the following:

- W) become a red giant and then evolve to a white dwarf
- X) become a neutron star
- Y) become a blue giant and evolve into a white dwarf
- Z) become a brown dwarf

ANSWER: W) BECOME A RED GIANT AND THEN EVOLVE TO A WHITE DWARF

TOSS-UP

- 5) MATH *Short Answer* In order, what are the first 5 prime numbers between 50 and 72?

ANSWER: 53, 59, 61, 67, 71

BONUS

- 5) MATH *Short Answer* What is the average speed, in miles per hour, of a person who travels 120 miles in 3 hours, 40 miles the next 3 hours, and 36 miles the following 2 hours?

ANSWER: 24.5 (ACCEPT: 24 – 25)

TOSS-UP

- 6) EARTH SCIENCE *Short Answer* What is the name for the outer 100 km of the solid Earth, which includes the crust and uppermost mantle:

ANSWER: LITHOSPHERE

BONUS

- 6) EARTH SCIENCE *Multiple Choice* Which of the following is NOT a metamorphic rock:

- W) marble
- X) quartzite
- Y) granite
- Z) gneiss (Pron: nice)

ANSWER: Y) GRANITE

TOSS-UP

- 7) GENERAL SCIENCE *Short Answer* Rounded the nearest fifty, one horsepower is equivalent to how many BTU's per hour?

ANSWER: 2550

(Solution: $2545 \text{ BTU} = 1 \text{ hp}$)

BONUS

- 7) GENERAL SCIENCE *Short Answer* Rounded to the nearest decimal place, convert 122°F into Centigrade:

ANSWER: 50

TOSS-UP

- 8) COMPUTER SCIENCE *Short Answer* What does the acronym ROM stand for?

ANSWER: READ ONLY MEMORY

BONUS

- 8) COMPUTER SCIENCE *Short Answer* The decimal number 10 is equivalent to what octal number?

ANSWER: 12 (read as: one, two)

TOSS-UP

- 9) CHEMISTRY *Short Answer* What is the term for the direct conversion of a solid to a vapor without going through a liquid phase?

ANSWER: SUBLIMATION

BONUS

- 9) CHEMISTRY *Short Answer* What element is a volatile purple-black solid with a beautiful metallic sheen, is found in minerals such as lautarite and dietzeite (Pron: lot-ah-right and dite-zite), was first prepared in 1811 from seaweed, and is the least reactive halogen?

ANSWER: IODINE (ACCEPT: I)

TOSS-UP

- 10) PHYSICS *Short Answer* If Lisa swings a ball on the end of a string and maintains it in uniform circular motion, what is the most accurate term for the tension force exerted on the rock through the string?

ANSWER: CENTRIPETAL

BONUS

- 10) PHYSICS *Short Answer* Neglecting friction, what is the acceleration, in meters per second squared, when a force of 2000 newtons is applied to a 10 kilogram object:

ANSWER: 200

(Solution: $A=F/M$; $A=2000/10$; $A=200 \text{ m/sec}^2$)

TOSS-UP

11) BIOLOGY *Multiple Choice* The wing of a bird and the arm of a human are considered:

- W) congruent structures
- X) analogous structures
- Y) homologous structures
- Z) vestigial structures

ANSWER: Y) HOMOLOGOUS STRUCTURES

BONUS

11) BIOLOGY *Short Answer* What bone marrow progenitor cell typically contains a polyploid nucleus of up to $64n$.

ANSWER: MEGAKARYOCYTE

TOSS-UP

12) ASTRONOMY *Short Answer* A sidereal (SIGH-deer-eel) hour is made of how many sidereal minutes?

ANSWER: 60

BONUS

12) ASTRONOMY *Short Answer* Rounded off to the nearest whole day, what is the sidereal rotation period of the Moon?

ANSWER: 27 DAYS (ACCEPT: 27)

TOSS-UP

13) MATH *Short Answer* The number 400 is what percent of 160?

ANSWER: 250

BONUS

13) MATH *Short Answer* What are the median, mean and mode of the following set of numbers:
1, 3, 8, 8, 9, 10, 12, 13

ANSWER: MEDIAN = 8.5; MEAN = 8; MODE = 8

TOSS-UP

14) EARTH SCIENCE *Multiple Choice* When drilling a well, if we wish to find a reliable supply of groundwater, we search for an:

- W) aquiduct
- X) aquifer
- Y) aquitard
- Z) aquaberm

ANSWER: X) AQUIFER

BONUS

14) EARTH SCIENCE *Short Answer* What is the name for the North Atlantic Ocean current which moves southeastward along the east coasts of Baffin Island, Labrador, and Newfoundland?

ANSWER: LABRADOR CURRENT

TOSS-UP

15) GENERAL SCIENCE *Multiple Choice* A nautical mile is approximately equal to how many miles:

- W) 1.65
- X) 1.15
- Y) 0.85
- Z) 0.75

ANSWER: X) 1.15

BONUS

15) GENERAL SCIENCE *Short Answer* Give the respective metric prefix for the following values: ten to the minus six, ten to the minus twelve, and ten to the minus eighteen?

ANSWER: MICRO; PICO; ATTO

TOSS-UP

16) COMPUTER SCIENCE *Multiple Choice* Which of the following do NOT provide both input and output of data:

- W) printers
- X) hard disks
- Y) writable CD-ROMs
- Z) diskettes

ANSWER: W) PRINTERS

BONUS

16) COMPUTER SCIENCE *Multiple Choice* In today's typical computers, if there isn't enough room in memory for all the information the CPU needs, the computer sets up what kind of memory file:

- W) real
- X) imaginary
- Y) virtual
- Z) temporary

ANSWER: Y) VIRTUAL

TOSS-UP

- 17) CHEMISTRY *Short Answer* In general, a polymer that is produced by the reaction between 2 or more different kinds of monomers are commonly referred to as:

ANSWER: COPOLYMERS

BONUS

- 17) CHEMISTRY *Short Answer* What is the general term for the amount of heat necessary to raise the temperature of exactly 1 gram of a substance by exactly 1°C?

ANSWER: SPECIFIC HEAT

TOSS-UP

- 18) PHYSICS *Short Answer* What colors are made from the addition of two primary colors?

ANSWER: SECONDARY COLORS

BONUS

- 18) PHYSICS *Short Answer* What is the resistance of an electric curling iron that draws 6 amps on a 120 volt line:

ANSWER: 20 OHMS

(Solution: $I = V/R$, $R = V/I$, $R = 120/6 = 20$)

TOSS-UP

19) BIOLOGY *Multiple Choice* Which of the following birds belong to the thrushes:

- W) Robin
- X) Titmouse
- Y) Chickadee
- Z) Purple Martin

ANSWER: W) ROBIN

BONUS

19) BIOLOGY *Short Answer* What is the common specific name for the bond that joins two amino acids to form a growing protein:

ANSWER: PEPTIDE BOND

TOSS-UP

20) ASTRONOMY *Short Answer* When a star condenses from interstellar material, the first thermonuclear reactions will involve only what element?

ANSWER: HYDROGEN

BONUS

20) ASTRONOMY *Short Answer* Name 4 terrestrial planets:

ANSWER: MERCURY, VENUS, EARTH, AND MARS

TOSS-UP

21) MATH *Multiple Choice* What is the percentage change when 3.5 becomes 4.5:

- W) 12
- X) 22
- Y) 29
- Z) 31

ANSWER: Y) 29

BONUS

21) MATH *Short Answer* What is the distance between the points, Q (0, 0) and P (4/5, 3/5)?

ANSWER: 1

(Solution: $d^2 = (4/5 - 0)^2 + (3/5 - 0)^2$; $= (4/5)^2 + (3/5)^2$; $= 1$)

TOSS-UP

22) GENERAL SCIENCE *Short Answer* In the SI system of units, what is charge measured in?

ANSWER: COULOMBS

BONUS

22) GENERAL SCIENCE *Short Answer* A screw is what type of simple machine?

ANSWER: AN INCLINED PLANE

TOSS-UP

23) CHEMISTRY *Multiple Choice* Which of the following fibers is considered a protein fiber:

- W) cotton
- X) hemp
- Y) linen
- Z) silk

ANSWER: Z) SILK

BONUS

23) CHEMISTRY *Short Answer* Convert an atmospheric pressure of 190 mmHg into atmospheres:

ANSWER: 0.25

(Solution: $190\text{mmHg} \times 1\text{atm}/760\text{mmHg}$)

TOSS-UP

24) PHYSICS *Short Answer* Which element has the simplest absorption spectrum?

ANSWER: HYDROGEN

BONUS

24) PHYSICS *Multiple Choice* Pitch is a function of frequency as loudness is a function of:

- W) wavelength
- X) tone
- Y) pitch
- Z) amplitude

ANSWER: Z) AMPLITUDE

TOSS-UP

25) BIOLOGY *Multiple Choice* Which of the following is not a spirochete:

- W) *Treponema pallidum* (Pron: Trep-o-née-ma pál-i-dum)
- X) *Leptospira interrogans* (Pron: Lept-o-spór-ah int-ér-o-gans)
- Y) *Rickettsia typhi* (Pron: Rick-éts-i-ah ty-fee)
- Z) *Borrelia recurrentis* (Pron: Bor-el-i-ah re-kur-én-tis)

ANSWER: Y) *RICKETTSIA TYPHI*

BONUS

25) BIOLOGY *Multiple Choice* Which of the following cells must remain alive to function as a conducting cell:

- W) annular tracheid
- X) scalariform (Pron: sklár-i-form) tracheid
- Y) seive cell
- Z) vessel element

ANSWER: Y) SEIVE CELL