

## ROUND 15A

---

### TOSS-UP

1) Energy – *Multiple Choice* Which of the following elements would one be likely to find in a catalytic converter?

- W) Calcium
- X) Thorium
- Y) Palladium
- Z) Neodymium

ANSWER: Y) PALLADIUM

### BONUS

1) Energy – *Short Answer* What part of a car engine is responsible for blending air and fuel before combustion?

ANSWER: CARBURETOR (ACCEPT: FUEL INJECTION SYSTEM, CRANKCASE)

~~~~~

### TOSS-UP

2) General Science – *Short Answer* How many bones can you find in the body of a Chondrichthyan [*kon-drik-thee-uhn*]?

ANSWER: ZERO

### BONUS

2) General Science – *Multiple Choice* What is the term for the circular movement of bodily extremities?

- W) Rotation
- X) Elevation
- Y) Circumduction
- Z) Extension

ANSWER: Y) CIRCUMDUCTION

### TOSS-UP

3) Earth and Space – *Short Answer* What is the term for a plate margin at which no tectonic activity occurs?

ANSWER: PASSIVE MARGIN

### BONUS

3) Earth and Space – *Multiple Choice* Which of the following ores is NOT a sulfide?

- W) Pyrite
- X) Galena
- Y) Sphalerite
- Z) Barite

ANSWER: Z) BARITE

---

### TOSS-UP

4) Physical Science – *Short Answer* What value, in regard to the electron, did J.J. Thompson discover?

ANSWER: CHARGE-TO-MASS RATIO

### BONUS

4) Physical Science – *Short Answer* What class of lever is typified by a pair of tweezers?

ANSWER: THIRD CLASS

### TOSS-UP

5) Life Science – *Short Answer* What is the main excitatory neurotransmitter in the human neuromuscular junction?

ANSWER: ACETYLCHOLINE

### BONUS

5) Life Science – *Multiple Choice* Most of the growth in a plant is due to which of the following?

- W) Cell elongation
- X) Cell division
- Y) Cell differentiation
- Z) Morphogenesis

ANSWER: W) CELL ELONGATION

~~~~~

### TOSS-UP

6) Math – *Short Answer* A combination lock requires 3 numbers to open the lock. The lock uses numbers one through 9. If you are allowed to repeat numbers, how many combinations could there be?

ANSWER: 729

### BONUS

6) Math – *Short Answer* If a prism has 18 edges, how many vertices does it have?

ANSWER: 12

**TOSS-UP**

7) Physical Science – *Short Answer* A child is holding a helium-filled balloon in an enclosed car. If the car suddenly accelerates in the positive x direction, in what direction will the balloon lean?

ANSWER: POSITIVE X DIRECTION

**BONUS**

7) Physical Science – *Short Answer* What principle states that no two electrons can occupy the same quantum state?

ANSWER: PAULI EXCLUSION PRINCIPLE



**TOSS-UP**

8) Energy – *Multiple Choice* Which of the following is NOT an important step in natural gas processing and treatment?

- W) Dehydration
- X) Oxygen extraction
- Y) Methane separation
- Z) Fractionation

ANSWER: X) OXYGEN EXTRACTION

**BONUS**

8) Energy – *Short Answer* Mercaptan is added to what energy resource to give it an odor?

ANSWER: NATURAL GAS

### TOSS-UP

9) Earth and Space – *Short Answer* The 21-centimeter radiation is characteristic of what element that is commonly found in interstellar space?

ANSWER: HYDROGEN

### BONUS

9) Earth and Space – *Multiple Choice* What gas is most common in the atmosphere of Venus?

- W) Nitrogen
- X) Carbon dioxide
- Y) Sulfuric acid
- Z) Hydrogen fluoride

ANSWER: X) CARBON DIOXIDE

~~~~~

### TOSS-UP

10) General Science – *Short Answer* If the temperature of a surface is below the freezing point of water, instead of dew formation, ice crystals will deposit on the surface. What are these ice formations called?

ANSWER: HOAR FROST

### BONUS

10) General Science – *Multiple Choice* Odontoceti and Mysticeti are terms given to:

- W) Whales, based on the structure of their mouths
- X) Crustaceans, based on their reproductive patterns
- Y) Marine mammals, based on their feeding behaviors
- Z) Marine invertebrates, based on hibernation periods

ANSWER: W) WHALES, BASED ON THE STRUCTURE OF THEIR MOUTHS

**TOSS-UP**

11) Life Science – *Short Answer* Radioactive iodine is used to image what organ?

ANSWER: THYROID

**BONUS**

11) Life Science – *Short Answer* Identify all of the following four amino acids that have a nonpolar side chain: 1) Valine; 2) Isoleucine; 3) Glutamate; 4) Phenylalanine.

ANSWER: 1, 3, AND 4



**TOSS-UP**

12) Math – *Multiple Choice* Which of the following is not a triangle congruence theorem?

- W) Side-side-side
- X) Side-side-angle
- Y) Side-angle-side
- Z) Angle-angle-side

ANSWER: X) SIDE-SIDE-ANGLE

**BONUS**

12) Math – *Short Answer* A woman drove to work at an average speed of 40 miles per hour and returned along the same route at 30 miles per hour. Expressing your answer as a mixed fraction, if her total traveling time was 1 hour, what was the total number of miles in the round trip?

ANSWER:  $34 \frac{2}{7}$

### TOSS-UP

13) Energy – *Short Answer* Order the following sectors from least to greatest in terms of U.S. coal consumption: 1) Heating; 2) Electricity; 3) Industry.

ANSWER: 1, 3, 2

### BONUS

13) Energy – *Short Answer* Mixed oxide fuels are a form of fuel used in what method of energy production?

ANSWER: NUCLEAR

~~~~~

### TOSS-UP

14) Math – *Short Answer* What is 76 times 84?

ANSWER: 6384

### BONUS

14) Math – *Short Answer* At the start of camp, Gracie scored 78 on her pre-test. At the end of the week, she scored 84 on her post test. Rounded to the nearest tenth of a percent, what is her percent increase?

ANSWER: 7.7

### TOSS-UP

15) General Science – *Multiple Choice* Which of the following toxins is produced by *Aspergillus flavus* and can be found on contaminated peanuts?

- W) Atropine
- X) Taxol
- Y) Sarin
- Z) Aflatoxin

ANSWER: Z) AFLATOXIN

### BONUS

15) General Science – *Multiple Choice* Aside from carbon, which of the following elements can one find in Teflon?

- W) Oxygen
- X) Chlorine
- Y) Fluorine
- Z) Nitrogen

ANSWER: Y) FLUORINE

~~~~~

### TOSS-UP

16) Life Science – *Short Answer* By what process does a mother cell split into four haploid daughter cells?

ANSWER: MEIOSIS

### BONUS

16) Life Science – *Short Answer* In genetics, what is the general term for the type of cross between the F1 generation of unknown genotype and a homozygous recessive organism?

ANSWER: TEST CROSS

**TOSS-UP**

17) Physical Science – *Short Answer* If a car is traveling at a constant velocity of 2.5 meters per second, how far, in meters, will it have traveled in 15 seconds?

ANSWER: 37.5

**BONUS**

17) Physical Science – *Multiple Choice* Which of the following substances would show the Tyndall effect?

- W) Blood
- X) Air
- Y) Gasoline
- Z) Salt water

ANSWER: W) BLOOD



**TOSS-UP**

18) Earth and Space – *Multiple Choice* What term describes a region where fresh water flows to the surface from underground?

- W) Aquifer
- X) Artesian
- Y) Spring
- Z) Geyser

ANSWER: Y) SPRING

**BONUS**

18) Earth and Space – *Short Answer* What effect refers to cities that have hotter temperatures than nearby areas?

ANSWER: HEAT ISLAND (ACCEPT: URBAN HEAT ISLAND)

### TOSS-UP

19) Physical Science – *Multiple Choice* If you double the mass of a cart while it is undergoing a constant unbalanced force, the acceleration will be:

- W) Doubled
- X) Quadrupled
- Y) Halved
- Z) Quartered

ANSWER: Y) HALVED

### BONUS

19) Physical Science – *Multiple Choice* Which of the following electromagnetic waves has a shorter wavelength than visible light?

- W) Radar
- X) Infrared
- Y) Ultraviolet
- Z) Microwave

ANSWER: Y) ULTRAVIOLET

~~~~~

### TOSS-UP

20) Earth and Space – *Short Answer* Yardangs are formed by what erosional agent?

ANSWER: WIND

### BONUS

20) Earth and Space – *Short Answer* The red color in the rocks of southern Utah is caused by oxides of what element?

ANSWER: IRON

### TOSS-UP

21) General Science – *Multiple Choice* An autoclave would often be used by which of the following scientists?

- W) Cosmologist
- X) Microbiologist
- Y) Paleontologist
- Z) Philologist

ANSWER: X) MICROBIOLOGIST

### BONUS

21) General Science – *Short Answer* What genus of protists are well known for their pseudopodia and are part of the phylum Rhizopoda [*rye-zoh-poh-duh*]?

ANSWER: AMOEBA

~~~~~

### TOSS-UP

22) Math – *Short Answer* For a weekend trip, you pack the following: three different shirts, three different pairs of shorts, two different belts, and one pair of shoes. How many unique outfits can you make using one of each article of clothing?

ANSWER: 18

### BONUS

22) Math – *Short Answer* What is the sum of the integers between 90 and 99, inclusive?

ANSWER: 945

### **TOSS-UP**

23) Life Science – *Short Answer* What structural carbohydrate is found in the cell walls of fungi and the exoskeletons of arthropods?

ANSWER: CHITIN

### **BONUS**

23) Life Science – *Short Answer* What effect occurs when a population is greatly reduced by events such as a natural disaster and causes certain alleles to be overrepresented?

ANSWER: BOTTLENECK EFFECT