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Science Bowl Questions

# TOSS-UP

1) BIOLOGY *Multiple Choice* The inherited disorder, sickle cell disease, is most common in the people of which ethnic group?

W) European-Americans

X) African-Americans

Y) Asian-Americans

Z) Middle-Eastern Americans

ANSWER: X) AFRICAN-AMERICANS

# BONUS

1) BIOLOGY *Short Answer* CAM plants belong to what plant family?

ANSWER: CRASSULACEAE

# TOSS-UP

2) MATH *Short Answer* A pendulum with the length of 15 cm swings through an angle of 60 degrees. What is the distance that the end travels? Leave your answer in terms of pi.

ANSWER: 5π

# BONUS

2) MATH *Multiple Choice* Which of the following polynomials is divisible by (3x-2)?

W) 3x3+9x2-35x+18

X) 12x3-8x2-21x+14

Y) 9x4-6x3+20x2-8x-4

Z) 3x5-2x4+5x3-4x2-24x+16

ANSWER: X) 12x3-8x2-21x+14

# TOSS-UP

3) CHEMISTRY *Short Answer* The electrons inside which two types of sublevels are involved in chemical reactions between atoms?

ANSWER: S AND P SUBLEVELS

# BONUS

3) CHEMISTRY *Multiple Choice* What is the mass, in grams, of 3 moles of glucose? Assume that the atomic mass of carbon is 12, hydrogen is 1, and oxygen is 16.

W) 450

X) 480

Y) 510

Z) 540

ANSWER: Z) 540

# TOSS-UP

4) EARTH AND SPACE SCIENCE *Short Answer* What is the name of the closest galaxy to ours?

ANSWER: ANDROMEDA GALAXY

# BONUS

4) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following is not a type of seismic fault?

W) Dip-Slip

X) Oblique

Y) Rough

Z) Strike-Slip

ANSWER: Y) ROUGH

# TOSS-UP

5) PHYSICS *Short Answer* A vertical arrow is placed on the principal axis 3 cm from a convex lens, creating an image 5 cm from the convex lens. In cm, what is the focal length of the lens? Express your answer in decimal form.

ANSWER: 1.875 cm.

# BONUS

5) PHYSICS *Multiple Choice* Which correctly describes the image created when an object is placed between a diverging lens and its focal point?

W) Virtual and larger than the object

X) Virtual and smaller than the object

Y) Real and larger than the object

Z) Real and smaller than the object

ANSWER: Y) REAL AND LARGER THAN THE OBJECT

## TOSS-UP

6) BIOLOGY *Multiple Choice*  The innermost lining of the digestive track is made with what kind of animal tissue?

W) Epithelial

X) Muscle

Y) Connective

Z) Nervous

ANSWER: W) EPITHELIAL

# BONUS

6) BIOLOGY *Multiple Choice* Which of the following is not a component of the immune and lymphatic systems?

W) Lymph nodes

X) Thymus

Y) White blood cells

Z) Thyroid

ANSWER: Z) THYROID

# TOSS-UP

7) MATH *Short Answer* Express 100 in the dozenal system.

ANSWER: 84

# BONUS

7) MATH *Short Answer* A triangle ABC has side lengths of 3, 5, and √19. Find angle A in degrees.

ANSWER: 60°

# TOSS-UP

8) CHEMISTRY *Multiple Choice* Which of the following best describes Hund’s Rule?

W) No more than two electrons can occupy one orbital

X) Electrons will occupy the lowest energy orbital possible.

Y) Each orbital in a sublevel must contain one electron before a second electron enters.

Z) We cannot know both the velocity and the location of an electron.

ANSWER: Y) EACH ORBITAL IN A SUBLEVEL MUST CONTAIN ONE ELECTRON BEFORE A DECOND ELECTRON ENTERS

# BONUS

8) CHEMISTRY  *Short Answer* An photon of light has a frequency of 5.0 x 1014 Hz. What is the energy, in Joules, of the photon? Express your answer in scientific notation with proper significant figures.

ANSWER: 3.3 x 10-19

# TOSS-UP

9) EARTH AND SPACE SCIENCE *Short Answer* Galena’s high density is due to what element in its chemical formula?

ANSWER: LEAD

# BONUS

9) EARTH AND SPACE SCIENCE *Multiple Choice* Which of the following minerals is not in the Bowen’s Reaction Series?

W) Biotite

X) Olivine

Y) Muscovite

Z) Rhodonite

ANSWER: Z) RHODONITE

# TOSS-UP

10) PHYSICS *Short Answer* A far-sighted person would need glasses with what kind of lens?

ANSWER: Convex

# BONUS

10) PHYSICS *Short Answer* A man is standing in a long train that is travelling at 50 mph, and he takes a ball, and throws it 60 mph. What is the speed of the ball, relative to the ground?

ANSWER: 10 mph