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Science Bowl Questions

Full Round

1. BIOLOGY *Short Answer-* A bulb is a modified version of what basic plant organ?

ANSWER: Stem

BIOLOGY *Multiple Choice-* Which of the following is true about pneumatophores?

W. Some plants, such as potatoes, store food and water inside pneumatophores.

X. Pneumatophores support the tall trunks of some tropical trees.

Y. Trees with pneumatophores inhabit tidal swamps.

Z. Trees with pneumatophores inhabit desert areas.

ANSWER: Y

1. MATH *Short Answer-* The apothem of a regular hexagon is 5√6. What is the area of the hexagon?

ANSWER: 300√3.

MATH *Short Answer-* A helicopter is hovering directly above John’s house at a height of 2 km. To the left, the angle of depression from the helicopter to Henry’s house is 30°. What is the distance from the helicopter to Henry’s house, in kilometers?

ANSWER: 4 km.

1. ENERGY *Multiple Choice-* About how many quads of energy did the United States consume in 2008?

W. 100

X. 200

Y. 300

Z. 400

ANSWER: W

ENERGY *Multiple Choice-* In 2009, the United States consumed the most energy in which category?

W. Commercial

X. Residential

Y. Transportation

Z. Industrial

ANSWER: Z

1. CHEMISTRY *Multiple Choice-* Which of the following scientists created a model of the atom in which the atom is an indestructible, indivisible sphere?

W. Thomson

X. Dalton

Y. Bohr.

Z. Schrodinger

ANSWER: X

CHEMISTRY *Short Answer-* What is the name of the principle that states that no more than two electrons can occupy one orbital?

ANSWER: Pauli Exclusion Principle

1. PHYSICS *Short Answer-* A ball travelling at a speed of 7 m/s is accelerates 2 m/s2 for 5 seconds. What is the ball’s final speed?

ANSWER: 17 m/s

PHYSICS *Short Answer* A truck driver is driving a 2000 kg truck at 10 m/s with the back of the truck open. Inside the back of the truck are 3 boxes with masses of 5 kg. The driver suddenly accelerates to a speed of 15 mph, and the boxes falls out. What is the change of momentum the truck experiences?

ANSWER: The truck gains 9775 kgm/s of momentum

1. EARTH AND SPACE SCIENCE *Multiple Choice* In which of the following parts of the HR Diagram would a super giant appear?

W. Upper left

X. Upper right

Y. Lower left

Z. Lower right

ANSWER: X

EARTH AND SPACE SCIENCE *Multiple Choice-* Which of the following statements are not true about star formation?

W. Stars are first formed when a cloud of gas and dust collapses within itself due to gravitational attraction.

X. A star like our Sun would take about 10 million years to mature from beginning of collapse to adulthood.

Y. The spinning cloud of gas and dust may separate into two or three separate clouds.

Z. The material at the center of a collapsing cloud heats up.

ANSWER: X

1. BIOLOGY *Short Answer-* Gnathostomes are vertebrates distinguishable from other types of vertebrates because of what anatomical structure?

ANSWER: Jaws

BIOLOGY *Short Answer-* Name the kingdom, phylum, subphylum, infraphylum, and class of the great white shark, respectively.

ANSWER: Animalia, Chordata, Vertebrata, Gnathostomata, Chondrichthyes

1. MATH *Short Answer-* What is the period of the function y=2sin(12πx/17)

ANSWER: 17/6

MATH *Multiple Choice-* Which of the following is not equal to 1?

W. sec(988π)

X. sin(-119π/2)

Y. cos(6π)

Z. sin(119π/2)

ANSWER: Z

1. ENERGY *Short Answer-* What is the name of the phenomenon where carbon dioxide combines with other compounds, creating a “shield” that lets the Sun’s light enter Earth’s atmosphere, but does not let the heat energy produced escape?

ANSWER: The Greenhouse Effect

ENERGY *Multiple Choice-* Which of the following is not true about energy consumption in the United States?

W. Roughly 36% of the energy the U.S. consumes comes from Petroleum.

X. Roughly 92% of the energy the U.S. consumes is nonrenewable.

Y. The most commonly used renewable energy source in the U.S. comes from hydropower.

Z. The least commonly used nonrenewable energy source in the U.S. comes from uranium.

ANSWER: Y

1. CHEMISTRY *Short Answer-* What law states that the ratios of the volumes of reacting gasses are small, whole numbers, when measured at the same temperature and pressure?

ANSWER: Gay-Lussac’s law of combining volumes

CHEMISTRY *Short Answer-* Rank the following four elements in increasing electronegativity. Tantalum, Iron, Vanadium, Hafnium.

ANSWER: Hafnium, Tantalum, Vanadium, Iron.

1. PHYSICS *Short Answer-* What is the radius of the curvature of a concave mirror if the focal length is 5 cm?

ANSWER: 10 cm.

PHYSICS *Multiple Choice-* To the nearest tenth of a cm, what is the image’s distance from a convex lens if the object distance from it is 4 cm, and the focal length is 7 cm?

W. 9.0

X. 9.3

Y. 9.6

Z. 9.9

ANSWER: X

1. EARTH AND SPACE SCIENCE *Short Answer-* What type of volcano is formed when viscous lava forces its way up the volcano and causes a bulge?

ANSWER: Cryptodomes

EARTH AND PACE SCIENCE *Short Answer-* Arrange the following types of magma from lowest silica composition. Intermediate composition, ultra mafic, mafic, and felsic.

ANSWER: Ultra mafic, mafic, intermediate composition, and felsic.