Tejas Pradeep

Science Bowl Questions-Chemistry and Energy

1. *Short Answer-*TOSSUP: What is the first element in the aluminum group?

ANSWER: Boron

1. *Short Answer-*BONUS: After which element does the Lanthanide series start?

ANSWER: Lanthanum

1. *Short Answer-*TOSSUP: What is the abbreviation of kinetic energy?

ANSWER: KE

1. *Short Answer-* BONUS: What does a dot in a chemical equation usually refer to?

ANSWER: loosely bonded

1. *Short Answer-*TOSSUP: What type of change is occurring in the digestion of food?

ANSWER: Chemical

1. *Short Answer-*BONUS: Using joules, what is the most common unit for specific heat?

ANSWER: joules per grams degree Celsius (J/g˚C)

1. *Multiple Choice-*TOSSUP: Who came up with the atomic model accepted by scientists today?

W. Bohr

X. Dalton

Y. Mendel

Z. Mendelev

ANSWER: X. Dalton

1. *Short Answer-*BONUS: What is the chemical formula for the compound octane?

ANSWER: C8H18

1. *Short Answer-*TOSSUP: What is the relative electrical charge of a proton?

ANSWER: +1

1. *Short Answer-*BONUS: What is the chemical formula for the substance Galena?

ANSWER: PbS

1. *Short Answer-*TOSSUP: What is the anion name of bromine?

ANSWER: Bromide

1. *Multiple Choice-*BONUS: What is the classical name of titanium (IV)?

W. Titanous

X. Titan

Y. Titanic

Z. Titanium

ANSWER: Titanic

1. *Short Answer-*TOSSUP: What is the electrical charge of acetate?

ANSWER: -1

1. *Short Answer-*BONUS: What is the anion name for the anion formula ClO-

ANSWER: Hypochlorite

1. *Short Answer-*TOSSUP: How many objects is equivalent to one gross?

ANSWER: 144 objects

1. *Short Answer-*BONUS: What is the value of one hundred moles of ions?

ANSWER: 602.2 X 1023 ions

1. *Short Answer-*TOSSUP: What is the Greek letter delta written above or below an arrow usually interpreted as, in a chemical equation?

ANSWER: Heat or Heat is added

1. *Short Answer-*BONUS: What are compounds containing only hydrogen and carbon called?

ANSWER: Hydrocarbons

1. *Short Answer-*TOSSUP: What are the discrete packets through which energy is emitted called?

ANSWER: Quanta

1. *Short Answer-*BONUS: What is the electron configuration of neon?

ANSWER: 1s22s22p6

1. *Short Answer-*TOSSUP: In organic chemistry, what is a reaction in which two substances join to produce one compound called?

ANSWER: Addition Reaction

1. *Short Answer-*BONUS: What are moth balls made of today?

ANSWER: Para-dichlorobenzene

1. *Short Answer-*TOSSUP: What is the degree equivalent of tertiary alcohol?

ANSWER: 3 degrees

1. *Short Answer-*BONUS: What is the boiling point in ˚C of methyl ethyl ether?

ANSWER: 8˚C

1. *Short Answer-*TOSSUP: What is the general formula for ethers?

ANSWER: ROR’

1. *Short Answer-*BONUS: What is the small repeating unit of a polymer?

ANSWER: Monomer

1. *Short Answer-*TOSSUP: What enzyme catalyzes the digestion of maltose to glucose?

ANSWER: Maltase

1. *Short Answer-*BONUS: What is the bond connecting amino acids in a protein called?

ANSWER: Peptide linkage or Peptide bond

1. *Short Answer-*TOSSUP: What is the most common name of the structure of DNA?

ANSWER: Double helix

1. *Short Answer-*BONUS: What is the process by which DNA directs the synthesis of RNA called?

ANSWER: Transcription

Energy

1. *Short Answer-*TOSSUP: According to what theorem is the conservation of energy a consequence of fact that the laws of physics do not change over time?

ANSWER: Noether’s theorem

1. *Short Answer-*BONUS: What type of photon is the lowest quantum mechanical energy state of photons?

ANSWER: Virtual photons

1. *Short Answer-*TOSSUP: What quasiparticle represents the quantization of the modes of lattice vibrations of periodic, elastic crystal structures of solids?

ANSWER: Phonon

1. *Short Answer-*BONUS: The energy of a harmonic oscillator is alternatively what two types of energy?

ANSWER: Kinetic and potential

1. *Short Answer-*TOSSUP: In an ideal gas, the interaction potential between particles is essentially what generalized function?

ANSWER: Delta function

1. *Short Answer-*BONUS: What is the name for the thermodynamic property that is a measure of the energy not available for work in a thermodynamic process?

ANSWER: Entropy

1. *Short Answer-*TOSSUP: What is the SI unit for energy?

ANSWER: Joules

1. *Short Answer-*BONUS: When oil reacts with oxygen, what type of energy is released?

ANSWER: Potential energy

1. *Short Answer-*TOSSUP: What is the process in which chemical potential energy is retrieved from sunlight by plants?

ANSWER: Photosynthesis

1. *Short Answer-*BONUS: What is the name of a physical system that does not interact with its surroundings?

ANSWER: Isolated system

1. *Short Answer-*TOSSUP: What type of energy includes thermal energy and radiant energy?

ANSWER: Kinetic energy

1. *Short Answer-*BONUS: What are three major forms of fossil fuels?

ANSWER: Coal, oil, and natural gas

1. *Short Answer-*TOSSUP: What energy does hydroelectric power use from moving water to make electricity?

ANSWER: Kinetic energy

1. *Short Answer-*BONUS: What is a kind of renewable energy that is found in landfills?

ANSWER: Biomass

1. *Short Answer-*TOSSUP: What kind of energy is associated with the motion or position of an object?

ANSWER: Mechanical energy

1. *Short Answer-*BONUS: What kind of energy were main reasons for Chernobyl and the Three Mile Island disaster?

ANSWER: Nuclear energy

1. *Short Answer-*TOSSUP: What kind of energy is the part the total, internal energy of a sample of matter that results in the material's temperature?

ANSWER: Thermal energy

1. *Short Answer-*BONUS: The thermal energy is partitioned equally between what all available quadratic degrees of particles?

ANSWER: Degrees of freedom

1. *Short Answer-*TOSSUP: What kind of energy is of electromagnetic waves?

ANSWER: Radiant energy

1. *Short Answer-*BONUS: What measure is needed to calculate the quantity of radiant energy with respect to time?

ANSWER: Integrating radiant flux