TOSS-UP

1. CHEMISTRY; Multiple Choice: Lemon juice has which one of the following levels of pH?

(W) 2

(X) 6

(Y) 10

(Z) 14

ANSWER: W—2

BONUS

1. CHEMISTRY; Multiple Choice: Under alkaline conditions, red litmus paper turns what

color?

(W) Red

(X) Blue

(Y) Yellow

(Z) Pink

ANSWER: X—BLUE

TOSS-UP

2. CHEMISTRY; Short Answer: What does the acronym VSEPR stand for?

ANSWER: VALENCE-SHELL ELECTRON-PAIR REPULSION

BONUS

1. CHEMISTRY; Multiple Choice: A tetrahedral molecule has what bond angle between its atoms?

(W) 90 degrees

(X) 104.5 degrees

(Y) 109.5 degrees

(Z) 120 degrees

ANSWER: Y—109.5 DEGREES

TOSS-UP

1. CHEMISTRY; Short Answer: What is the term for a solution that has more solute than can be dissolved?

ANSWER: SUPERSATURATED (ACCEPT: SUPERSATURATED SOLUTION)

BONUS

3. CHEMISTRY; Short Answer: What is the unit for molar solubility?

ANSWER: MOLES PER LITER (ACCEPT: MOL/L)

TOSS-UP

4. CHEMISTRY; Short Answer: Organic compounds that have twice as many hydrogen

atoms as carbon atoms are known as what?

ANSWER: ALKENES

BONUS

4. CHEMISTRY; Multiple Choice: Name the functional group that contains two hydrogen atoms and one nitrogen atom.

(W) Carboxyl

(X) Amide

(Y) Nitrogenous

(Z) Amino

ANSWER: Z—AMINO

TOSS-UP

5. CHEMISTRY; Multiple Choice: What is the common name for 2,4-dichlorophenoxacetic acid?

(W) Gibberellin

(X) Napalm

(Y) Agent Orange

(Z) Gunpowder

ANSWER: Y—AGENT ORANGE

BONUS

5. CHEMISTRY; Multiple Choice: What class of chemicals is used as herbicides?

(W) Auxins

(X) Abscisic acids

(Y) Sulfates

(Z) Hydrazines

ANSWER: W—AUXINS

TOSS-UP

1. CHEMISTRY; Short Answer: A chemical reaction is said to be in what if the rates of its forward and reverse reactions are equal?

ANSWER: CHEMICAL EQUILIBRIUM (ACCEPT: EQUILIBRIUM)

BONUS

6. CHEMISTRY; Short Answer: The ratio of a reaction’s forward rate to its reverse rate is known as what?

ANSWER: EQUILIBRIUM CONSTANT

TOSS-UP

7. CHEMISTRY; Multiple Choice: Which of the following is not used to determine the amount of free energy of a reaction?

(W) Temperature

(X) Rate of reaction

(Y) Entropy

(Z) Enthalpy

ANSWER: X—RATE OF REACTION

BONUS

7. CHEMISTRY; Multiple Choice: In a thermally isolated system, which of the following will always remain constant?

(W) Pressure

(X) Rate of reaction

(Y) Potential energy

(Z) Total energy

ANSWER: Z—TOTAL ENERGY

TOSS-UP

8. CHEMISTRY; Short Answer: What is the equation for the ideal gas law?

ANSWER: PV=nRT

BONUS

8. CHEMISTRY; Multiple Choice: In joules per Kelvin per mole, the universal gas constant is approximately

(W) 8.314

(X) 8.734

(Y) 9.003

(Z) 9.421

ANSWER: W—8.314

TOSS-UP

9. CHEMISTRY; Multiple Choice: How many atoms are in one molecule of glucose?

(W) 6

(X) 10

(Y) 16

(Z) 24

ANSWER: Z—24

BONUS

1. CHEMISTRY; Short Answer: To three significant figures, how many atoms are in one mole of glucose?

ANSWER: 1.44 X

TOSS-UP

10. CHEMISTRY; Short Answer: Name the four major types of macromolecules found in biological systems.

ANSWER: CARBHYDRATES, LIPIDS, PROTEINS, NUCLEIC ACIDS

BONUS

10. CHEMISTRY; Multiple Choice: Amino acids are the monomers of what class of macromolecules?

(W) Nucleic acids

(X) Lipids

(Y) Proteins

(Z) Carbohydrates

ANSWER: Y—PROTEINS

TOSS-UP

11. CHEMISTRY; Short Answer: What is the most electronegative element?

ANSWER: FLUORINE

BONUS

11. CHEMISTRY; Multiple Choice: Water molecules display adhesive properties due to what

type of bonding?

(W) Covalent

(X) Ionic

(Y) Hydrogen

(Z) Van der Waals

ANSWER: Y—HYDROGEN

TOSS-UP

12. CHEMISTRY; Short Answer: What man-made element has the lowest atomic number?

ANSWER: NEPTUNIUM

BONUS

12. CHEMISTRY; Multiple Choice: What is the most abundant element in the universe?

(W) Hydrogen

(X) Helium

(Y) Oxygen

(Z) Iron

ANSWER: W—HYDROGEN

TOSS-UP

13. CHEMISTRY; Multiple Choice: What is the term for a substance that can act as either an acid or a base?

(W) Pluripotent

(X) Totipotent

(Y) Amphipathic

(Z) Amphoteric

ANSWER: Z—AMPHOTERIC

BONUS

13. CHEMISTRY; Short Answer: A substance of pH 3 is how many more times acidic than a substance of pH 9?

ANSWER: ONE MILLION

TOSS-UP

14. CHEMISTRY; Short Answer: Name the simplest organic acid.

ANSWER: FORMIC ACID

BONUS

14. CHEMISTRY; Multiple Choice: What is the parent compound of aromatic carboxylic

acids?

(W) Acetic acid

(X) Abscisic acid

(Y) Benzanoic acid

(Z) Butyric acid

ANSWER: Y—BENZANOIC ACID

TOSS-UP

15. CHEMISTRY; Short Answer: What is the type of reaction that occurs when an acid reacts with a base?

ANSWER: NEUTRALIZATION REACTION

BONUS

15. CHEMISTRY; Multiple Choice: When in solution, bases increase the concentration of what substance?

(W) Hydrogen

(X) Hydroxide

(Y) Water

(Z) Deuterium

ANSWER: X—HYDROXIDE

TOSS-UP

16. CHEMISTRY; Short Answer: Substances that can rotate plane-polarized light are known to have what property?

ANSWER: OPTICAL ACTIVITY

BONUS

16. CHEMISTRY; Multiple Choice: If a substance rotates plane-polarized light to the right, it

is known as what?

(W) devorotatory

(X) dextrorotatory

(Y) levorotatory

(Z) lextrorotatory

ANSWER: X—DEXTROROTATORY

TOSS-UP

17. CHEMISTRY; Multiple Choice: What class of chemicals is found in aerosol cans and is currently creating a hole in earth’s ozone layer?

(W) Sulfates

(X) Carbon oxides

(Y) CFCs

(Z) POPs

ANSWER: Z—CFCS

BONUS

17. CHEMISTRY; Short Answer: The last column of the periodic table contains what class of elements?

ANSWER: NOBLE GASES (ACCEPT: INERT GASES)

TOSS-UP

18. CHEMISTRY; Multiple Choice: The curve that the surface of a liquid takes when placed in a container is known as the what?

(W) Meniscus

(X) Micelle

(Y) Capillary action

(Z) Lorenz curve

ANSWER: W—MENISCUS

BONUS

18. CHEMISTRY; Short Answer: What is the property in which the molecules within a liquid

are attracted to each other?

ANSWER: COHESION

TOSS-UP

19. CHEMISTRY; Multiple Choice: What is the term for the loss of electrons of a substance?

(W) Reduction

(X) Oxidation

(Y) Ionization

(Z) Dissociation

ANSWER: X--OXIDATION

BONUS

19. CHEMISTRY; Short Answer: Based on the activity series of metals, what metal is easiest to oxidize?

ANSWER: POTASSIUM

TOSS-UP

20. CHEMISTRY; Multiple Choice: Which of the following is the most commonly used metal

element in the world?

(W) Iron

(X) Copper

(Y) Aluminum

(Z) Tin

ANSWER: W—IRON

BONUS

20. CHEMISTRY; Short Answer: Steel is primarily made up of which two elements?

ANSWER: IRON AND CARBON

TOSS-UP

21. CHEMISTRY; Short Answer: What is the term for a partial or complete solid solution of

one or more elements in a metallic matrix?

ANSWER: ALLOY

BONUS

21. CHEMISTRY; Multiple Choice: A mixture in which the size of each particle is 10−9 to 10−6 meters is known as a(n)

(W) Emulsion

(X) Homogeneous mixture

(Y) Heterogeneous mixture

(Z) Colloid

ANSWER: Z—COLLOID

TOSS-UP

22. CHEMISTRY; Short Answer: Protons and neutrons are collectively known as what?

ANSWER: NUCLEONS

BONUS

22. CHEMISTRY; Multiple Choice: Which of the following does not have a charge of minus

one?

(W) Three bottom quarks

(X) A beta particle

(Y) A muon

(Z) Three charm quarks

ANSWER: Z—THREE CHARM QUARKS

TOSS-UP

23. CHEMISTRY; Short Answer: An alpha particle consists of how many protons and how

many neutrons?

ANSWER: TWO PROTONS AND TWO NEUTRONS

BONUS

23. CHEMISTRY; Multiple Choice: Which of the following is a unit that measures radioactivity?

(W) Langley

(X) Stokes

(Y) Roentgen

(Z) Jansky

ANSWER: Y—ROENTGEN

TOSS-UP

24. CHEMISTRY; Multiple Choice: A carbon that is bonded to four different functional

groups is known as

(W) Symmetric

(X) Asymmetric

(Y) Optically active

(Z) Optically inactive

ANSWER: X—ASYMMETRIC

BONUS

24. CHEMISTRY; Short Answer: All thiols contain what functional group?

ANSWER: SULFHYDRYL

TOSS-UP

25. CHEMISTRY; Short Answer: Organic compounds can be divided into two groups, one containing benzene rings and one not containing them. What is the name of the group that does not contain benzene rings?

ANSWER: ALIPATHIC COMPOUNDS

BONUS

25. CHEMISTRY; Multiple Choice: Acetylene falls under what class of organic compounds?

(W) Alkanes

(X) Alkenes

(Y) Alkynes

(Z) Aromatics

ANSWER: Y—ALKYNES

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Mira Loma Science Bowl

25 Chemistry Questions

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