Some Basic Concepts of Chemistry MCQ

NATURE OF MATTER

1. The substances whose compositions are not uniform and different components are mixed are called _____
a) Homogenous substances
b) Heterogeneous substances
c) Pure substances
d) Elements

2. A _____ is made up of two or more pure substances which may be in any ratio.
a) Mixture
b) Element
c) Molecule
d) Atom

3. Matter can be divided into two types i.e. mixture and pure substance.
a) True
b) False

4. Which of the following is not a pure substance?
a) Copper
b) Gold
c) Sugar solution
d) Water

5. What are pure substances classified as?
a) Elements and Atoms
b) Molecules and Compounds
c) Elements and Compounds
d) Atoms and Molecules

6. When two or more atoms of different elements combine with each other in a fixed ratio, the molecule of a ____ is obtained.
a) Compound
b) Element
c) Atom
d) Ion

7. Compounds cannot be separated by chemical methods.
a) True
b) False

8. Point out an example of a compound.
a) Sugar solution
b) Hydrogen

c) Ammonia
d) Sodium

9. Which among the three states of matter has a definite shape and size?
a) Solids
b) Liquids
c) Gases
d) Vapor

10. Water is a/an _____
a) Element
b) Compound
c) Pure substance
d) Mixture

ANSWERS

1-b	2-a	3-a	4-c	5-c	6-a	7-b	8-c	9-a	10-b

IMPORTANCE OF CHEMISTRY

1. Patients suffering from AIDS can be helped using which of the following drugs?
a) Cisplatin
b) AZT (Azidothymidine)
c) Taxol
d) Codeine

2. What are the basic constituents of matter?
a) Atoms & Molecules
b) Atoms & Moles
c) Molecules & Ions
d) Nuclei & Ions

3. Which of the following is a chemical change?
a) Conversion of water to ice
b) Rusting of iron
c) Crumpling a sheet of aluminum foil
d) Casting silver

4. What does Sushruta Samhita explain?
a) Alkanes
b) Alkynes
c) Noble gases
d) Alkalies importance

5. Philosophy of changing substances into another form is called as _____
a) Physiology
b) Anatomy

c) Alchemy
d) Transformation

6. Rasopanishada says how the gunpowder mixture is used in war.
a) True
b) False

7. What does the Elixir of life of do?
a) grants immortality
b) cures diseases
c) kills a person
d) cause an incurable disease

8. The paintings on the walls of Ajanta and Ellora cave were based on _____
a) Varahmihir's Brihat Samhitha
b) Sushruta Samhita
c) Rasopanishada
d) Charaka Samhita

9. Seeds of Manhua plant and oil of Eranda were used in making _____
a) cosmetic powder
b) color dye
c) perfume
d) soap

10. Charaka Samhita is the oldest known book of Ayurvedic in India.
a) True
b) False

ANSWERS

1-b	**2-a**	**3-b**	**4-d**	**5-c**	**6-b**	**7-a**	**8-a**	**9-d**	**10-a**

Properties of Matter and their Measurement

1. Which of the following may not be a physical property?
a) Odor
b) Color
c) Density
d) Composition

2. The observation of _____ properties needs a chemical change to occur.
a) Chemical
b) Physical
c) Extrinsic
d) Intrinsic

3. Candela is the S.I. unit of _____
a) Luminous intensity

b) Thermodynamic temperature
c) Amount of substance
d) Electric current

4. How many scientific fundamental quantities are given S.I. units?
a) 5
b) 7
c) 3
d) 9

5. What is the symbol of the amount of substance's S.I. unit?
a) K
b) s
c) mol
d) kg

6. What are the multiples for the prefixes yocto, atto respectively?
a) 10^{-24}, 10^{-18}
b) 10^{-9}, 10^{-15}
c) 10^{-15}, 10^{-24}
d) 10^{-24}, 10^{-21}

7. 1Litre = _____ m^3.
a) 1000
b) 0.001
c) 1
d) 10

8. What is the difference in units between Kelvin and centigrade scales of temperature?
a) 212.15
b) 32
c) 298
d) 273.15

9. What is the human body temperature in Fahrenheit?
a) 212
b) 98.6
c) 273.15
d) 32

10. Convert 40°C to °F.
a) 104K
b) 313°F
c) 104°F
d) 313K

ANSWERS

1-d	2-a	3-a	4-b	5-c	6-a	7-b	8-d	9-b	10-c

Uncertainty in Measurement

1. Write 6354000000 in scientific notation.
a) 6.354×10^9
b) 6354×10^6
c) 0.64×10^{10}
d) 6354000×10^3

2. _____ is referred to as the closeness of different measurements for the same quantity.
a) Accuracy
b) Precision
c) Analysis
d) Dimension

3. How many seconds are there in a half day?
a) 86,400 seconds
b) 43,200 seconds
c) 172,800 seconds
d) 3660 seconds

4. A piece of iron is 5 inches long. How much would it be in centimeters?
a) 12.7 cm
b) 6.35 cm
c) 5 cm
d) 500 cm

5. How many significant figures does 0.057 have?
a) 2
b) 4
c) 3
d) 0

6. How many significant figures does 63180 have?
a) 5
b) 4
c) 1
d) 2

7. The exact value is 150m. A students record it as 140.1m in 1st turn and 140.8m in the 2nd turn. Comment his/her recordings.
a) precise
b) accurate
c) neither precise nor accurate
d) both precise and accurate

8. The exact value is 150m. A students record it as 149.1m in 1st turn and 150.8m in the 2nd turn. Comment his/her recordings.
a) precise
b) accurate
c) neither precise nor accurate
d) both precise and accurate

9. Multiply 1.2 and 3.91. Obtain the result as per the rules of significant figures.
a) 4.692
b) 4.69
c) 5
d) 4.7

10. How many significant figures are there in 60.6?
a) 4
b) 2
c) 3
d) 1

ANSWERS

1-a	**2-b**	**3-b**	**4-a**	**5-a**	**6-b**	**7-a**	**8-b**	**9-d**	**10-c**

Laws of Chemical Combination

1. How many basic laws are required to govern the combination of elements to form compounds?
a) 6
b) 5
c) 4
d) 1

2. Who proposed Law of Conservation of Mass?
a) Antoine Lavoisier
b) Joseph Proust
c) Lorenzo Romano
d) Joseph Louis

3. What did Joseph Proust state regarding Law of Definite Proportions?
a) A given mixture always contains absolutely the same proportion of elements by weight
b) A given compound always contains absolutely the same proportion of moles by weight
c) A given compound always contains absolutely the same proportion of elements by volume
d) A given compound always contains absolutely the same proportion of elements by weight

4. What did Dalton propose?
a) Law of Multiple Proportions
b) Avogadro's Law

c) Law of Definite Composition
d) Law of Conservation of Mass

5. Who proposed the Law of Definite Composition?
a) Joseph Proust
b) Lorenzo Romano
c) Joseph Louis
d) Antoine Lavoisier

6. Law of Definite Composition is also known as _____
a) Law of Multiple Proportions
b) Avogadro's Law
c) Law of Definite Proportion
d) Law of Conservation of Mass

7. The volumes of hydrogen & oxygen when combined bear a simple ratio of 2:1.This is explained by _____
a) Law of Multiple Proportions
b) Avogadro's Law
c) Law of Definite Proportion
d) Gay Lussac's Law of Gaseous Volumes

8. Who proposed that equal volumes of all gases at the same temperature & given pressure should contain an equal number of molecules?
a) Antoine Lavoisier
b) Joseph Proust
c) Avogadro
d) Joseph Louis

9. Which of the following is not a law of chemical combination?
a) Law of Multiple Proportions
b) Avogadro's Law
c) Law of Definite Proportion
d) Law of Conservation of volume

10. Which of the following may be an incorrect statement?
a) Law of Definite Composition is also known as Law of Definite composition
b) Mass can neither be created nor destroyed is Law of Conservation of Volume
c) Antoine Lavoisier conducted many experiments regarding combustion
d) Five basic laws are required to govern the combination of elements to form compounds

ANSWERS

1-b	**2-a**	**3-d**	**4-a**	**5-a**	**6-c**	**7-d**	**8-c**	**9-d**	**10-b**

Dalton's Atomic Theory

1. According to Dalton's Atomic Theory, matter consists of indivisible _____
a) Molecules
b) Atoms
c) Ions
d) Mixtures

2. Atoms of different elements differ in mass.
a) True
b) False

3. What did Dalton's Theory couldn't explain?
a) gaseous volumes
b) conservation of mass
c) chemical philosophy
d) indivisible atoms

4. What is the name of Dalton's publication?
a) A New system of atomic Philosophy
b) An old system of Chemical Philosophy
c) A New System of Chemical Philosophy
d) A New System of Chemical Prophecy

5. Which of the following may not be explained by Dalton's atomic theory?
a) reason for combining atoms
b) conservation of mass
c) chemical philosophy
d) indivisible atoms

6. Law of conservation of mass isn't explained in Dalton's atomic theory.
a) True
b) False

7. What is 1 Dalton?
a) a unified mass unit, $1.360539040(20)\times10^{-27}$kg
b) a unified mass unit, $1.640539040(20)\times10^{-27}$kg
c) a unified mass unit, $1.660539040(20)\times10^{-27}$kg
d) a unified mass unit, $1.660539040(20)\times10^{-27}$kg

8. Could Dalton's atomic theory explain the laws of chemical combinations?
a) No
b) Yes
c) Only a few
d) Except one

9. They are no limitations to Dalton's atomic theory.
a) True
b) False

10. All atoms of a given element have identical _____ including identical _____
a) Properties, mass
b) Weight, volume
c) Volume, properties
d) Temperature, pressure

ANSWERS

1-b	**2-a**	**3-a**	**4-c**	**5-a**	**6-b**	**7-d**	**8-b**	**9-b**	**10-a**

Atomic and Molecular Masses

1. As, per the current system, carbon-12 has been taken as the standard for measuring atomic masses.
a) True
b) False

2. What is the mass of hydrogen in terms of amu?
a) 1.0020 amu
b) 1.0180 amu
c) 1.0070 amu
d) 1.0080 amu

3. What is the abbreviation of amu?
a) Atomic matter unit
b) Atomic mass unified
c) Atomic mass unit
d) At mass unity

4. Nowadays, “amu” is replaced by ____
a) u
b) g
c) kg
d) am

5. Calculate the average atomic mass of nitrogen present in the atmosphere?

ISOTOPE	ABUNDANCE	ATOMIC MASS
^{14}N	99.69%	14.0031 amu
^{15}N	0.39%	15.0001 amu

a) 14.007 amu
b) 15.001 amu

c) 14.000 amu
d) 14.0031 amu

6. A sample of carbon that contains 70% carbon-12 and 30% carbon-14. What do you think is the average atomic mass of this sample?
a) 14.5
b) 14.14
c) 14
d) 12

7. _____ is the sum of atomic masses of the elements present in a molecule.
a) Average atomic mass
b) Atomic mass
c) Gram formula mass
d) Molecular mass

8. What's the molecular mass of carbon dioxide?
a) 43
b) 28
c) 44
d) 40

9. What's the formula mass of NaCl?
a) 23 u
b) 35.5 u
c) 58 u
d) 58.5 u

10. Calculate the molecular mass of sucrose($C_{12}H_{22}O_{11}$) molecule?
a) 342 amu
b) 343 amu
c) 341 amu
d) 340 amu

ANSWERS

1-a	**2-d**	**3-c**	**4-a**	**5-a**	**6-c**	**7-d**	**8-c**	**9-d**	**10-a**

Mole Concept and Molar Masses

1. According to S.I. the system, _____ was used to measure the amount of substance.
a) mole
b) weight machine

c) weight
d) mass

2. What's the number of entities or particles together in mole concept known as?
a) Boltzmann constant
b) Avogadro's number
c) Universal gas constant
d) Reynold's number

3. 1 u = M_a/N_A.
a) True
b) False

4. A mole of any substance contains _____
a) 6.022 x 10^{26} particles
b) 6.022 x 10^{22} particles
c) 6.022 x 10^{23} particles
d) 3.022 x 10^{22} particles

5. 12.044 x 10^{23} atoms of oxygen contains _____
a) 1 mole of oxygen
b) 2 moles of oxygen
c) 3 moles of oxygen
d) 4 moles of oxygen

6. If one mole of ammonia contains "y" number of particles, then how many particles do 1 mole of glucose contain?
a) 2y
b) 0.5y
c) 3y
d) y

7. What's the number of particles in 10 moles of hydrochloric acid?
a) 6.022 x 10^{22} particles
b) 6.022 x 10^{23} particles
c) 6.22 x 10^{23} particles
d) 3.22 x 10^{22} particles

8. Which of the following statement is correct?
a) The value of Avogadro's number is 6.022×10^{22} atoms
b) One molecule of any substance contains Avogadro's number of particles
c) One mole is the amount of a substance that contains as many particles as there are atoms in exactly 12 g of the carbon atom
d) 1 u is not equal to M_a/N_A

9. One mole of sucrose contains how many grams of sucrose?
a) 342g
b) 343g
c) 341g
d) 340g

10. 1 mole of ammonia is of 17 g. Then what is the mass of 0.3 moles of ammonia?
a) 21g
b) 2.1g
c) 17g
d) 1g

ANSWERS

1-a	**2-b**	**3-a**	**4-c**	**5-b**	**6-d**	**7-a**	**8-c**	**9-a**	**10-b**

Percentage Composition

1. A _____ formula represents a whole number ratio to the simplest form.
a) Molecular
b) Empirical
c) Simpler
d) Shorter

2. Even without knowing the mass percent of each element, we can calculate the empirical formula.
a) True
b) False

3. _____ formula can be calculated if the molar mass is known after having an empirical formula.
a) Molecular
b) Empirical
c) Simpler
d) Shorter

4. Which of the following is an empirical formula?
a) $C_6H_{12}O_6$
b) H_2O_2
c) CH_4
d) C_2H_6

5. The molecular formula of a compound is $C_6H_{12}O_6$. What's the empirical formula for this compound?
a) $C_6H_{12}O_6$
b) CHO
c) $C_2H_6O_2$
d) CH_2O

6. A compound consists of 52.17% of carbon, 13.04% of hydrogen and 34.78% of oxygen. Find the molecular formula if the given molecular weight of the compound is 46g.
a) C_2H_5OH
b) C_2H_6
c) $C_6H_{12}O_6$
d) CH_2O

7. Which of the following cannot be a molecular formula for an empirical formula HO?
a) H_2O
b) H_2O_2
c) HO
d) HO_2

8. In glucose simplest ratio between C, H and O is _____
a) 6:12:6
b) 3:4:3
c) 1:2:1
d) 2:3:2

9. Which of the following is true regarding molecular formula?
a) actual whole numbered ratio
b) rational numbered ratio
c) simplest possible whole numbered ratio
d) the same as the empirical ratio

10. Which of the following cannot be an empirical formula?
a) NH_3
b) C_5H_{10}
c) H_2O
d) NaCl

ANSWERS

1-b	**2-b**	**3-a**	**4-c**	**5-d**	**6-a**	**7-b**	**8-c**	**9-a**	**10-b**

Stoichiometry and Stoichiometric Calculations

1. In a particular reaction, one of the reactants limits the number of products formed. That is called as _____
a) Limiting reagent
b) Limiting product
c) Excessive reagent
d) Excessive reactant

2. Which of the following is not true regarding balanced chemical equations?
a) They contain the same number of atoms on each side
b) Electrons are also balanced
c) An equal number of molecules on both the side
d) Follows the law of conservation of mass

3. Which of the given reactions are counted as balanced reactions?
a) $H_2 + O_2 \rightarrow 2H_2O$
b) $4Al + 3O_2 \rightarrow 2Al_2O_3$
c) $Mg(OH)_2 + 2HNO_3 \rightarrow 2Mg(NO_3)_2 + 2H_2O$
d) $N_2 + 3H_2 \rightarrow NH_3$

4. What is the amount of water produced when 8g of hydrogen is reacted with 32g of oxygen?
a) 2moles
b) 1mole
c) 3 moles
d) 0.5mole

5. Calculate the mass percent of magnesium in the formation of magnesium oxide.
a) 0.3
b) 1.5
c) 0.67
d) 0.6

6. A and B are two solutions that are mixed. Calculate the resultant solution's molarity.

Initial Solutions	Molarity	Volume
A	1.3	100ml
B	0.8	500ml

a) 0.8 mol/L
b) 0.88 mol/L
c) 1.3 mol/L
d) 1.05 mol/L

7. A solution contains 8 moles of solute and the mass of the solution is 4 kg. What's the molality of this solution?
a) 5 mol/kg
b) 8 mol/kg
c) 4 mol/kg
d) 0.5 mol/kg

8. In a container, there are 4 moles of nitrogen, 3 moles of oxygen and 7 moles of hydrogen; find out the mole fraction of oxygen in this reaction.
a) 0.2143
b) 0.2142
c) 0.1234
d) 0.2434

9. Find the amount of carbon dioxide produced by the combustion of 20g of methane.
a) 44g
b) 20g
c) 66g
d) 22g

10. What's the balanced equation of $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$?
a) $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$
b) $6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6\ O_2$
c) $6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 2\ O_2$
d) $3\ CO_2 + 2H_2O \rightarrow C_6H_{12}O_6 + O_2$

ANSWERS

1-a	2-c	3-b	4-a	5-d	6-b	7-d	8-a	9-c	10-b