BASIC CONCEPTS OF CHEMISTRY

MCQ

1. A pure substance which contains only one type of atom is called ————.

(a) An element (b) a compound

(c) a solid (d) a liquid

2. The smallest particle that can take part in chemical reactions is ————.

(a) Atom (b) molecule (c) Both (a) and (b) (d) none of these

3. Which of the following is a homogeneous mixture?

(a) Mixture of soil and water (b) Sugar solution

(c) Mixture of sugar, salt and sand (d) Iodised table salt

4. The significant figures in 0.00051 are ————.

(a) 5 (b) 3 (c) 2 (d) 2

5. Formation of CO and CO2 illustrates the law of ————.

(a) Law of conservation of mass (b) Law of Reciprocal proportion

(c) Law of Constant Proportion (d) Law of Multiple Proportion

6. The number of significant figures in 6.02 x 1023 is ————.

(a) 23 (b) 3 (c) 4 (d) 26

7. The prefix 10^6

is ————.

(a) giga (b) exa (c) kilo (d) mega

8. The mass of an atom of carbon is ————.

(a) 1g (b) 1.99 x 10-23 g (c) 1/12 g (d) 1.99 x 1023 g

9. A measured temperature on Fahrenheit scale is 200F. What will this reading be on the Celsius

Scale?

(a) 40 ℃ (b) 94 ℃ (c) 93.3 ℃ (d) 30 ℃

10. Which of the following pairs of gases contains the same number of molecules?

(a) 16 g of O2 and 14 g of N2 (b) 6 g of O2 and 22 g of CO2

(c) 28 g of N2 and 22 g of CO2 (d) 32 g of CO2 and 32g of N2

ASSERTION (A) AND REASON (R)

Directions : Each of these questions contain two statements, Assertion and Reason. Each of these

questions also has four alternative choices, only one of which is the correct answer. You have to

select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

© Assertion is correct, reason is incorrect

(c) Assertion is incorrect, reason is correct.

1. Assertion : Equal moles of different substances contain same number of constituent particles.

Reason : Equal weights of different substances contain the same number of constituent particles.

2. Assertion : 1.231 has three significant figures.

Reason : All numbers right to the decimal point are significant.

3. Assertion : Volume of a gas is inversely proportional to the number of moles of gas.

Reason : The ratio by volume of gaseous reactants and products is in agreement with their mole Ratio.

4. Assertion : Significant figures for 0.200 is 3 whereas for 200 it is 1.

Reason : Zero at the end or right of a number are significant provided they are not on the right Side of the decimal point.

5. Assertion : One atomic mass unit is defined as one twelfth of the mass of one carbon – 12 atom.

Reason : Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as Standard.

6. Assertion : The empirical mass of ethene is half of its molecular mass.

Reason : The empirical formula represents the simplest whole number ratio of various atoms Present in a compound.

7. Assertion: The number of O atoms in 16 g of oxygen and 16 g of ozone is same.

Reason: Each of the species represent 1 g-atom of oxygen.

CASE BASED QUESTION – 1

An Indian philosopher Maharishi Kanad(400400 BC), postulated that if matter keeps on Dividing, then a stage will come when the particles obtained by division would no longer Divide further, i.e. further division will not be possible. These particles were called paramanu by Him. Democritus and Leucippus, the ancient Greek philosophers, also suggested the same thing Around that period. Democritus first used the word atom (meaning indivisible) for these Indivisible particles. But there was no experimental verification available for these Considerations. Some essential laws of the chemical combination were given by Antoine Lavoisier and Joseph L Proust. These laws have proved very helpful in the development of Chemistry. Chemical laws are those laws of nature relevant to chemistry. The most fundamental Concept in chemistry is the law of conservation of mass, which states that there is no detectable Change in the quantity of matter during an ordinary chemical reaction. Modern physics shows that It is actually

energy that is conserved, and that energy and mass are related; a concept which Becomes important in nuclear chemistry. Conservation of energy leads to the important concepts Of equilibrium, thermodynamics, and kinetics.

Answer the following questions:

(a)Define atom.

OR

Name the chemist who proposed the “Law of Definite Proportions”

(b)What is the law called which deals with the ratios of the volumes of the gaseous reactants and Products?

©If two elements can combine to form more than one compound, the masses of one element that

(i) Is this statement true?
(ii) If yes, state according to which law?

CASE BASED QUESTION – 2

One of the more frequent activities in healthcare is the measurement of biological quantities such As body mass, body temperature, blood pressure or plasma cholesterol concentration. Unfortunately, When reading biomedical journals some confusion related to the basic metrological concepts and Terms may be observed. Among these concepts, concentration is one of the more important ones,Because the different types of concentration are the most frequently generic quantities taken into Account. But other generic quantities, such as the different types of contents, are often taken into Account and often confused with concentration. Clarification of these concepts is necessary.In Practice, when we are considering a solution or a suspension, it is to say, an amount of any Type per volume of liquid or gas we are dealing with a concentration. It should be kept in mind that The same SI unit may be used to express the values of quantities of different kind, i.e. volume mass And mass concentration use kg/L, and as molarity and substance concentration use mol/L-1.

Answer the following questions:

(a)How is the mole defined?

(b)What is the symbol for the SI unit of the mole?

©What is the mass per cent of carbon in carbon dioxide?

d) What will be the molarity of a solution, which contains 5.85 g of NaCl(s) per 500 mL?