



INDIAN SCHOOL SOHAR
UNIT TEST 1 (2023-24)
CHEMISTRY THEORY (043)
 SET-1

CLASS : XI
 DATE : 18/05/23

MAX. MARK : 20
 TIME : 40 MINUTES

General instructions:

1. There are **10** questions in this question paper with internal choice.
2. **SECTION A-** consists of 6 multiple-choice questions carrying **1** mark each.
3. **SECTION B-** consists of 1 very short answer questions carrying **2** marks each.
4. **SECTION C-** consists of 1 short answer questions carrying **3** marks each.
5. **SECTION D-** consists of 1 case-based question carrying **4** marks.
6. **SECTION E-** consists of 1 long answer questions carrying **5** marks with internal choice.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed**

SECTION- A

Question no. **1** to **6** are multiple choice (MCQ) type questions, carrying **1** mark each.

1. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water? 1
 - (i) 0.1 m
 - (ii) 1 M
 - (iii) 0.5 m
 - (iv) 1 m
2. Which of the following statements about a compound is incorrect? 1
 - (i) A molecule of a compound has atoms of different elements.
 - (ii) A compound cannot be separated into its constituent elements by physical methods of separation.
 - (iii) A compound retains the physical properties of its constituent elements.
 - (iv) The ratio of atoms of different elements in a compound is fixed
3. Which of the following properties of atom could be explained correctly by Thomson Model of atom? 1
 - (i) Overall neutrality of atom.
 - (ii) Spectra of hydrogen atom.
 - (iii) Position of electrons, protons and neutrons in atom.
 - (iv) Stability of atom.
4. The Planet Rock station broadcasts on a frequency of 1368kHz. Calculate the wave length of electromagnetic radiation emitted by the transmitter. 1
 - (i) 5.093 m
 - (ii) 124.2m
 - (iii) 219.3m
 - (iv) 316.3m

In the following questions (Q.No.5 and 6) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices:

- (a) Assertion and Reason both are correct statements and Reason is the correct explanation for assertion.
- (b) Assertion and Reason both are correct statements but reason is **not** the correct explanation for assertion.
- (c) Assertion is correct statement, but Reason is wrong statement.
- (d) Assertion is wrong statement, but Reason is correct statement

5. **Assertion (A):** One atomic mass unit is defined as one twelfth of the mass of one carbon-12 atom. 1
Reason (R): Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.
6. **Assertion (A):** Photoelectric effect is most readily shown by cesium metal. 1
Reason (R): Photons have easiest access to the surface of cesium metal

SECTION- B

7. Yellow light emitted from a sodium lamp has a wavelength of 580nm. Calculate frequency and wave number of the yellow light. 2

SECTION- C

8. Explain the properties of cathode and Anode rays. 3

SECTION- D

This question is a case-based questions. Read the case carefully and answer the question that follow.

9. Stoichiometry is a section of chemistry that involves calculation based on chemical equations. Chemical equations are governed by laws of chemical combination. Mass of reactants is equal to mass of products. Compound obtained from different methods contain the same elements in the fixed ratio by mass. 4
Mole is a counting unit, equal to 6.022×10^{23} particles. One mole is equal to molar mass expressed in grams. One mole of every gas at STP has volume equal to 22.4L. The reacting species which are consumed in the reaction completely is called limiting reagent which decides amount of products formed. Concentration of solution is expressed in terms of molarity, molality and mole fraction.
- Find the number of moles of NH_3 formed by reaction of 2moles of N_2 with 2moles of H_2 ?
 - What do you understand by the term Mole?
 - Vitamin C is known to contain 1.29×10^{24} hydrogen atoms. Calculate the number of moles of hydrogen atoms.

OR

- What is mole fraction? Find the number of mole fraction of H_2O in aqueous solution of glucose with χ_{glucose} is 0.1.

SECTION- E

The following question is long answer type, carrying 5 marks with an internal choice.

10. A compound on analysis gave the following percentage composition: Na = 14.31% , S = 9.97% , H = 6.22% , O = 69.5%. Calculate the molecular formula of the compound on the assumption that all hydrogen in the compound is present in combination with oxygen as water of crystallization. Molecular mass of compound is 322. 5

OR

How many milliliters of 0.5M H_2SO_4 are needed to dissolve 0.5g of copper (II) carbonate? (Molar mass of Cu= 63.5u)



INDIAN SCHOOL SOHAR
UNIT TEST 1 (2023-24)
CHEMISTRY THEORY (043)
SET-2

CLASS : XI
 DATE : 18/05/23

MAX. MARK : 20
 TIME : 40 MINUTES

General instructions:

1. There are **10** questions in this question paper with internal choice.
2. **SECTION A-** consists of 6 multiple-choice questions carrying **1** mark each.
3. **SECTION B-** consists of 1 very short answer questions carrying **2** marks each.
4. **SECTION C-** consists of 1 short answer questions carrying **3** marks each.
5. **SECTION D-** consists of 1 case-based question carrying **4** marks.
6. **SECTION E-** consists of 1 long answer questions carrying **5** marks with internal choice.
7. **All questions are compulsory.**
8. **Use of log tables and calculators is not allowed**

SECTION- A

Question no. **1** to **6** are multiple choice (MCQ) type questions, carrying **1** mark each. 6x1

=6

1. If the concentration of glucose ($C_6H_{12}O_6$) in blood is 0.9 g L^{-1} , what will be the molarity of glucose in blood? 1
 - (i) 5 M
 - (ii) 50 M
 - (iii) 0.005 M
 - (iv) 0.5 M
2. Which of the following pairs have the same number of atoms? 1
 - (i) 16 g of $O_2(g)$ and 4 g of $H_2(g)$
 - (ii) 16 g of O_2 and 44 g of CO_2
 - (iii) 28 g of N_2 and 32 g of O_2
 - (iv) 12 g of $C(s)$ and 23 g of $Na(s)$
3. Which of the following conclusions could not be derived from Rutherford's α -particle scattering experiment? 1
 - (i) Most of the space in the atom is empty.
 - (ii) The radius of the atom is about 10^{-10} m while that of nucleus is 10^{-15} m .
 - (iii) Electrons move in a circular path of fixed energy called orbits.
 - (iv) Electrons and the nucleus are held together by electrostatic forces of attraction
4. If travelling at same speeds, which of the following matter waves have the shortest wavelength? 1
 - (i) Electron
 - (ii) Alpha particle (He^{2+})
 - (iii) Neutron
 - (iv) Proton

In the following questions (Q.No.5 and 6) a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices:

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- (d) Assertion is wrong statement, but Reason is correct statement.

5. **Assertion (A):** Black body is an ideal body that emits and absorbs radiations of all frequencies. 1
Reason (R): The frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature.

6. **Assertion (A):** The empirical mass of ethene is half of its molecular mass. 1
Reason (R): The empirical formula represents the simplest whole number ratio of Various atoms present in a compound.

SECTION- B

7. The wave number of a beam of light is 400cm^{-1} . What is the wavelength of the light in nanometers? Also find out frequency of the light. 2

SECTION- C

- 8 Explain observation and conclusion of Rutherford's alpha particle scattering experiment. 3

SECTION- D

This question is a case-based questions. Read the case carefully and answer that question that follow.

9. Concentrations of solution can be expressed in terms of mass percentage, volume percentage, mass/volume percentage. Molarity, molality and mole fractions are also used to express concentration of solution. Molality can be converted into molarity and vice-versa if density of solution is given. Mole fraction of solute can be converted into molality and vice-versa if we know molar mass of solvent. Laws of chemical combinations are applicable to compounds and also in chemical reactions. 4
- a) How many electrons are present in 18mL of H_2O ? (Density of $\text{H}_2\text{O} = 1\text{g/mL}$).
b) Define molality.
c) Find the mole fraction of solute in 1m aqueous solution.

OR

- c) 250mL of 1.5M solution of sulphuric acid is diluted by adding 5L of water. What is the molarity of the diluted solution?

SECTION- E

The following question is long answer type, carrying 5 marks with an internal choice.

10. An organic compound on analysis gave the following data: C = 57.82% , H=3.6% and rest is oxygen. Its vapour density is 83. Find its empirical and molecular formula. 5

OR

- a) Zinc and hydrochloric acid react according to the following reaction.
$$\text{Zn (s)} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \text{ (g)}$$

If 0.30mol of Zn are added to hydrochloric acid containing 0.52mol of HCl , how many moles of hydrogen are produced?
- b) Light of wave length 400nm strikes a certain metal which has a photoelectric work function of 2.13eV. Find out the maximum kinetic energy of the photoelectrons.