विद्या सर्वार्थि साधिका

ANANDALAYA

PERIODIC TEST -1

Class: XI

Subject: Chemistry MM: 30

Date : 21-07-2023 Time: 1 Hr. 30 min.

General Instructions:

(1) There are 17 questions in all. All questions are compulsory.

(2) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.

(3) Section A consists of eleven MCQs of 1 mark each, Section B consists of two questions of 2 marks each, Section C consists of two questions of 3 marks each, Section D consists of one long question of 5 marks and Section E consists of one case- study based question of 4 marks.

(4) Use of calculators is not allowed.

SECTION A

1. Which of the following statements about a compound is incorrect? (1)
   (A) A molecule of a compound has atoms of different elements.
   (B) A compound cannot be separated into its constituent elements by physical methods of separation.
   (C) A compound retains the physical properties of its constituent elements.
   (D) The ratio of atoms of different elements in a compound is fixed.

2. The number of significant figures for the three numbers 221 cm, 0.221 cm, 0.0221 cm are (1)
   (A) 3,3, and 3 respectively. B) 3, 4 and 4 respectively
   (C) 3, 4 and 5 respectively D) 3, 3 and 4 respectively

3. How much copper is present in 50 grams of copper? (Atomic mass of Cu= 63.5, S=32, O=16) (1)
   (A) 19.90 g (B) 39.81g (C) 63.5 g (D) 31.71 g

4. Which of the following is the most appropriate measurement? (1)
   (A) 9 m (B) 9.0 m (C) 9.00 m (D) 9.000 m

5. A solution is made by dissolving 49 g of H_2SO_4 (Molecular mass-98 u)in 250 mL of water. The molarity of the solution prepared is: (1)
   (A) 2 M (B) 1 M (C) 4 (D) 5 M

6. How many moles of oxygen gas can be produced during electrolytic decomposition of 180 g of water (Molecular mass of water = 18u) (1)
   (A) 2.5 moles (B) 5 moles (C) 10 moles (D) 7 moles

7. 2.82 g of glucose is dissolved in 30 g of water. The mole fraction of glucose (180 u)is: (1)
   (A) 0.01 (B) 0.99 (C) 0.52 (D) 1.66

8. What will be the number of hydrogen atoms in 8.5 g of NH_3? (Atomic mass of N = 14 u, H=1u) (1)
   (A) 6.023×10^{23} (B) 5.31×10^{-23} (C) 9.034×10^{23} (D) 3×10^{23}

9. Which one of the following will have largest number of atoms? (1)
   (A) 1 g Au (s) (B) 1 g Na (s) (C) 1 g Li (s) (D) 1 g Cl_2 (s)
   Atomic mass of Au = 197 u, Na = 23 u, Li = 7 u, Cl= 35.5 u

For question numbers 10 and 11, two statements are given-one labelled Assertion and the other labelled Reason. Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion

(B) Both Assertion and Reason are true but Reason is NOT the correct explanation of Assertion.

(C) Assertion is true but Reason is false
(D) Assertion is false and Reason is also false.

10. 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.

11. Assertion (A): Significant figures for 0.200 is 3 whereas for 200 it is 1. (1)
Reason (R): Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.

SECTION B

12. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction $2A + 4B \rightarrow 3C + 4D$, when 5 moles of A react with 6 moles of B, then (2)
(i) Which is the limiting reagent? (ii) Calculate the amount of C formed?

13. Volume of a solution changes with change in temperature, then, will the molality of the solution be affected by temperature? Give reason for your answer. (2)

SECTION C

14. Calcium carbonate reacts with aqueous HCl to give $CaCl_2$ and CO_2 according to the reaction, $CaCO_3$ (s) + 2 HCl (aq) $\rightarrow$ $CaCl_2$ (aq) + CO_2 (g) + H_2O(l) What mass of $CaCO_3$ is required to react completely with 25 mL of 0.75 M HCl? (3)

15. Calculate the concentration of nitric acid in moles per litre in a sample which has a density, 1.41 g mL–1 and the mass per cent of nitric acid in it being 69% (3)

SECTION D

16. (i) Express 2.54 mm into S.I units. (5)
(ii) Out of milk, diamond, air, petrol which is pure substance?
(iii) Balance the equation: $NO_2 + H_2O \rightarrow HNO_3 + NO$
(iv) What is percentage of Na in Na_2CO_3? (Na = 23u, C = 12, O = 16u)

OR

(i) $_{17}Cl^{35}$ and $17Cl^{37}$ are in ratio of 3: 1 in nature. What is atomic mass of Cl?
(ii) What is empirical formula of $C_6H_{12}O_6$?
(iii) Chlorophyll contains 2.68% magnesium atoms. Calculate mass of magnesium atoms in 2g of chlorophyll.

SECTION E

Questions 17 is a Case Study Based question carrying 4 marks.

17. Every experimental measurement has some amount of uncertainty associated with it. However, one would always like the results to be precise and accurate. Precision and accuracy are often referred to while we talk about the measurement.
In the table given below to illustrate precision and accuracy. Study the table and answer the questions based on the table and related studied concepts.
Data to Illustrate Precision and Accuracy

Measurement in g	I	II	III	Average
Student A	0.521 g	0.515 g	0.509 g	0.515 g
Student B	0.516 g	0.515 g	0.514 g	0.515 g
Student C	0.521 g	0.520 g	0.520 g	0.520 g

(i) Which student data is precise but not accurate? (1)
(ii) The data of which student is both precise and accurate? (1)
(iii) If actual mass of a piece of metal is 0.520 g, data for which student is neither precise nor accurate. What do you mean by precision? (2)

OR

(iii) How many significant figures are in 0.520? What is the scientific notation for 0.520?