

0	1	2	3	4	5	6	7	8	9
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Answers

9. (5) 10. (8) 11. (4)



NCERT

Exemplar Problems

Objective Questions

Multiple Choice Questions (Type-I)

1. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data mark the correct option out of the following statements.

Student	Readings	
	(i)	(ii)
A	3.01	2.99
B	3.05	2.95

- (a) Results of both the students are neither accurate nor precise.
 (b) Results of student A are both precise and accurate.
 (c) Results of student B are neither precise nor accurate.
 (d) Results of student B are both precise and accurate.
2. A measured temperature on Fahrenheit scale is 200°F . What will this reading be on Celsius scale?
 (a) 40°C (b) 94°C
 (c) 93.3°C (d) 30°C
3. What will be the molarity of a solution, which contains 5.85 g of $\text{NaCl}(s)$ per 500 mL?
 (a) 4 mol L^{-1} (b) 20 mol L^{-1}
 (c) 0.2 mol L^{-1} (d) 2 mol L^{-1}

4. If 500 mL of a 5M solution is diluted to 1500 mL, what will be the molarity of the solution obtained?
 (a) 1.5 M (b) 1.66 M
 (c) 0.017 M (d) 1.59 M
5. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
 (a) 4 g He (b) 46 g Na
 (c) 0.40 g Ca (d) 12 g He
6. If the concentration of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in blood is 0.9 g L^{-1} , what will be the molarity of glucose in blood?
 (a) 5 M (b) 50 M
 (c) 0.005 M (d) 0.5 M
7. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water?
 (a) 0.1 m (b) 1 M
 (c) 0.5 m (d) 1 m
8. One mole of any substance contains 6.022×10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in 100 mL of 0.02M H_2SO_4 solution is _____
 (a) 12.044×10^{20} molecules
 (b) 6.022×10^{23} molecules
 (c) 1×10^{23} molecules
 (d) 12.044×10^{23} molecules
9. What is the mass percent of carbon in carbon dioxide?
 (a) 0.034 % (b) 27.27 %
 (c) 3.4 % (d) 28.7 %

Answers

1. (b) 2. (c) 3. (c) 4. (b) 5. (d) 6. (c) 7. (d) 8. (a) 9. (b)

Competition File

10. The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?
 (a) $\text{C}_9\text{H}_{18}\text{O}_9$ (b) CH_2O
 (c) $\text{C}_6\text{H}_{12}\text{O}_6$ (d) $\text{C}_2\text{H}_4\text{O}_2$
11. If the density of a solution is 3.12 g mL^{-1} , the mass of 1.5 mL solution in significant figures is _____.
 (a) 4.7 g (b) $4680 \times 10^{-3} \text{ g}$
 (c) 4.680 g (d) 46.80 g.
12. Which of the following statements about a compound is incorrect?
 (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.
13. Which of the following statements is correct about the reaction given below:

$$4\text{Fe}(s) + 3\text{O}_2(g) \longrightarrow 2\text{Fe}_2\text{O}_3(g)$$

 (a) Total mass of iron and oxygen in reactants = total mass of iron and oxygen in product, therefore it follows law of conservation of mass.
- (b) Total mass of reactants = total mass of product; therefore, law of multiple proportions is followed.
 (c) Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess.
 (d) Amount of Fe_2O_3 produced will decrease if the amount of any one of the reactants (iron or oxygen) is taken in excess.
14. Which of the following reactions is not correct according to the law of conservation of mass.
 (a) $2\text{Mg}(s) + \text{O}_2(g) \longrightarrow 2\text{MgO}(s)$
 (b) $\text{C}_3\text{H}_8(g) + \text{O}_2(g) \longrightarrow \text{CO}_2(g) + \text{H}_2\text{O}(g)$
 (c) $\text{P}_4(s) + 5\text{O}_2(g) \longrightarrow \text{P}_4\text{O}_{10}(s)$
 (d) $\text{CH}_4(g) + 2\text{O}_2(g) \longrightarrow \text{CO}_2(g) + 2\text{H}_2\text{O}(g)$
15. Which of the following statements indicates that law of multiple proportions is being followed.
 (a) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1 : 2.
 (b) Carbon forms two oxides namely CO_2 and CO , where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2 : 1.
 (c) When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed.
 (d) At constant temperature and pressure 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour.

Answers

10. (c) 11. (a) 12. (c) 13. (a) 14. (b) 15. (d)

Multiple Choice Questions (Type-II)

16. One mole of oxygen gas at STP is equal to
 (a) 6.022×10^{23} molecules of oxygen
 (b) 6.022×10^{23} atoms of oxygen
 (c) 16 g of oxygen
 (d) 32 g of oxygen
17. Sulphuric acid reacts with sodium hydroxide as follows:

$$\text{H}_2\text{SO}_4 + 2\text{NaOH} \longrightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$$

 When 1L of 0.1M sulphuric acid solution is allowed to react with 1L of 0.1M sodium hydroxide solution, the amount of sodium sulphate formed and its molarity in the solution obtained is
 (a) 0.1 mol L^{-1} (b) 7.10 g
 (c) 0.025 mol L^{-1} (d) 3.55 g
18. Which of the following pairs have the same number of atoms?
 (a) 16 g of $\text{O}_2(g)$ and 4 g of $\text{H}_2(g)$
 (b) 16 g of O_2 and 44 g of CO_2
 (c) 28 g of N_2 and 32 g of O_2
 (d) 12 g of $\text{C}(s)$ and 23 g of $\text{Na}(s)$
19. Which of the following solutions have the same concentration?
 (a) 20 g of NaOH in 200 mL of solution
 (b) 0.5 mol of KCl in 200 mL of solution
 (c) 40 g of NaOH in 100 mL of solution
 (d) 20 g of KOH in 200 mL of solution

Answers

16. (a, d) 17. (b, c) 18. (c, d) 19. (a, b)

20. 16 g of oxygen has same number of molecules as in
 (a) 16 g of CO (b) 28 g of N₂
 (c) 14 g of N₂ (d) 1.0 g of H₂

21. Which of the following terms are unitless ?

- (a) Molarity (b) Molarity
 (c) Mole fraction (d) Mass percent

22. One of the statements of Dalton's atomic theory is given below :

"Compounds are formed when atoms of different elements combine in a fixed ratio."

Which of the following laws is not related to this statement ?

- (a) Law of conservation of mass
 (b) Law of definite proportions
 (c) Law of multiple proportions
 (d) Avogadro law

20. (c, d) 21. (c, d) 22. (a, d)

Matching Type Questions

23. Match the following :

- | | |
|---|--------------------------------------|
| (i) 88 g of CO ₂ | (a) 0.25 mol |
| (ii) 6.022×10^{23} molecules of H ₂ O | (b) 2 mol |
| (iii) 5.6 litres of O ₂ at STP | (c) 1 mol |
| (iv) 96 g of O ₂ | (d) 6.022×10^{23} molecules |
| (v) 1 mol of any gas | (e) 3 mol |

24. Match the following physical quantities with units :

Physical quantity	Unit
(i) Molarity	(a) g mL ⁻¹
(ii) Mole fraction	(b) mol
(iii) Mole	(c) Pascal
(iv) Molality	(d) Unitless
(v) Pressure	(e) mol L ⁻¹
(vi) Luminous intensity	(f) Candela
(vii) Density	(g) mol kg ⁻¹
(viii) Mass	(h) Nm ⁻¹
	(i) kg

23. (i) - (b); (ii) - (c); (iii) - (a); (iv) - (e); (v) - (d).
 24. (i) - (e); (ii) - (d); (iii) - (b); (iv) - (g); (v) - (c); (vi) - (f); (vii) - (a); (viii) - (i).

Assertion and Reason Type Questions

In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is given. Choose the correct option out of the choices given below each question.

25. **Assertion (A)** : The empirical mass of ethene is half of its molecular mass.
Reason (R) : The empirical formula represents the simplest whole number ratio of various atoms present in a compound.
 (a) Both A and R are true and R is the correct explanation of A.
 (b) A is true but R is false.

- (c) A is false but R is true.
 (d) Both A and R are false.

26. **Assertion (A)** : One atomic mass unit is defined as one twelfth of the mass of one carbon-12 atom.

Reason (R) : Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) Both A and R are false.

Answers

25. (a) 26. (b)

Competition File

27. (c) 28. (c)

Answers

27. **Assertion (A)** : Significant figures for 0.200 is 3 where as for 200 it is 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.

(a) Both A and R are true and R is the correct explanation of A.

(b) Both A and R are true but R is not a correct explanation of A.

(c) A is true but R is false.

(d) Both A and R are false.

28. **Assertion (A)** : Combustion of 16 g of methane gives 18 g of water.

Reason (R) : In the combustion of methane, water is one of the products.

(a) Both A and R are true but R is not the correct explanation of A.

(b) A is true but R is false.

(c) A is false but R is true.

(d) Both A and R are false.

Hints & Explanations for Difficult Objective Type Questions