CBSE

ATOMS AND MOLECULES WS 4

Class 09 - Science

Section A

1. What information do we get from the molecular formula? **[1]**

   a. It represents one molecule of the substance.

   b. It does not tell the name of the substance.

   c. It tells about the type of atoms.

   d. It represents the formula mass unit of the substance.

   a) (b) and (c) are correct
   b) All of these
   c) (a) and (b) are correct
   d) (a), (c) and (d) are correct

2. Which of the following represents a correct chemical formula? Name it. **[1]**

   a) $NaSO_4$
   b) NaS
   c) CaCl
   d) $BiPO_4$

3. Which of the following elements are present in Quick lime? **[1]**

   A. Calcium, Oxygen

   B. Sodium, Hydrogen, Oxygen

   C. Calcium, Bromine

   D. Calcium chloride

   a) (B)
   b) (D)
   c) (C)
   d) (A)

4. An element P forms an oxide with formula PO. The formulae of its sulphate and phosphate will be respectively **[1]**

   a) $P_2(SO_4)_3$ and PPO_4
   b) PSO_4 and $P_2(PO_4)_3$
   c) $P(SO_4)_2$ and $P(PO_4)_2$
   d) PSO_4 and $P_3(PO_4)_2$

5. The formula for quicklime is **[1]**

   a) $Ca(OH)_2$
   b) $CaCl_2$
   c) CaO
   d) $CaCO_3$

6. Sulphate of a divalent metal M exists in hydrated form. If 0.10 mol of metal sulphate combines with 9.0 g of water to form the hydrated salt then, the formula of metal sulphate will be **[1]**

   a) $M_2SO_4 \cdot 3H_2O$
   b) $MSO_4.5H_2O$
   c) $M_2SO_4 \cdot 2H_2O$
   d) $MSO_4 \cdot H_2O$

7. Which of the following statements are incorrect? **[1]**

i. Dichromate ion is a divalent and positive ion.

ii. Barium ion is trivalent and positive.

iii. Solid sulphur is a polyatomic molecule.

iv. Ammonium ion is divalent and positive.

a) i, ii and iv only

b) i, ii and iii only

c) iii and iv only

d) i and ii only

8. What is the formula of calcium phosphide? **[1]**

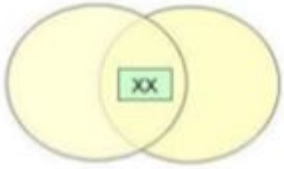
a) CaP

b) $Ca_3(PO_4)_2$

c) $CaCl_2$

d) Ca_3P_2

9. Which type of bond displace in the following figure? **[1]**



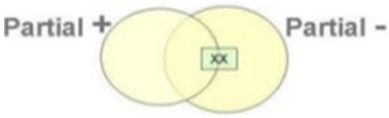
a) Polar covalent bonds

b) Ionic bond

c) Hydrogen bond

d) Covalent bond

10. **[1]**



The bond displace in this figure is _____.

a) polar covalent bonds

b) covalent bond

c) ionic bond

d) hydrogen bond

11. Match the following with correct response. **[1]**

(a) Nitrate	(i) NO_2^-
(b) Phosphide	(ii) NO_3^-
(c) Nitrite	(iii) PO_4^{3-}
(d) Phosphate	(iv) P^{3-}

a) (a) - (i), (b) - (iii),(c) - (ii), (d) - (iv)

b) (a) - (iv), (b) - (i),(c) - (iii), (d) - (ii)

c) (a) - (ii), (b) - (iv),(c) - (i), (d) - (iii)

d) (a) - (iii), (b) - (ii),(c) - (iv), (d) - (i)

12. Match the following with the correct response: **[1]**

(1) PCl_5	(A) Phosphorous pentachloride
(2) N_2O_5	(B) Dinitrogen tetraoxide
(3) N_2O_4	(C) Dinitrogen pentaoxide
(4) CCl_4	(D) Carbon tetrachloride

a) 1-B, 2-D, 3-A, 4-C

b) 1-C, 2-B, 3-D, 4-A

c) 1-D, 2-A, 3-C, 4-B

d) 1-A, 2-C, 3-B, 4-D

13. Match the following with the correct response: **[1]**

(1) PCl_5	(A) Dinitrogen tetraoxide
(2) N_2O_5	(B) Phosphorous pentachloride
(3) N_2O_4	(C) Carbon tetrachloride
(4) CCl_4	(D) Dinitrogen pentaoxide

a) 1-C, 2-B, 3-D, 4-A
b) 1-D, 2-A, 3-C, 4-B
c) 1-A, 2-C, 3-B, 4-D
d) 1-B, 2-D, 3-A, 4-C

14. Which of the following is an incorrect chemical formula of the given compound? **[1]**

A. Zinc Phosphate - $Zn_3(PO_4)_2$
B. Ferric Carbonate - $Fe_2(CO_3)_2$
C. Calcium Phosphate - Ca_3PO_4
D. Sodium Sulphide - Na_2S

a) All of these
b) B and C
c) B and D
d) A and D

15. Which of the following is/are the incorrect chemical formulas of the given compound? **[1]**

a. Zinc Phosphate - $Zn_3(PO_4)_2$
b. Ferric carbonate - $Fe_3(CO_3)_2$
c. Calcium Phosphate - Ca_3PO_4
d. Sodium Sulphide- Na_2S

a) (a) and (b) are incorrect
b) All of these
c) (a), (b) and (c) are incorrect
d) (b) and (c) are incorrect

16. Which of the following statements is not true about H_2SO_4? **[1]**

A. It is composed of 2 Hydrogen, 1 Sulphur, and 4 Oxygen atoms.
B. Its relative molecular mass is 98.
C. It is composed of one molecule of H_2, one atom of S, and two molecules of O_2.
D. Its relative molecular mass is 108.

a) All of these
b) C and D
c) B and C
d) A, B and D

17. What is the valency of calcium is $CaCO_3$? **[1]**

18. Formula of the carbonate of a metal M is M_2CO_3. Write the formula of its chloride. **[1]**

19. The valency of the of an element A is 4. Write the formula of its oxide. **[1]**

20. An element X has valency 3 while the element Y has valency 2. Write the formula of the compound between X and Y. **[1]**

21. An elements Z forms an oxide with formula Z_2O_3. What is its valency? **[1]**

Section B

22. **Fill in the blanks:** **[2]**

(a) The chemical formula of a molecular compound is determined by the _____ of each element. **[1]**

(b) A _____ of a compound shows its constituent elements and the number of atoms of each combining element. **[1]**

23. Give the chemical formulae for the following compounds and compute the ratio by mass of the combining elements in each one of them. (You may use appendix-III). **[2]**

a. Ammonia

b. Carbon monoxide

c. Hydrogen chloride

d. Aluminium fluoride

e. Magnesium sulphide

24. Give the formulae of the compounds formed from the following sets of elements. **[2]**

i. Calcium and fluorine

ii. Hydrogen and sulphur

iii. Nitrogen and Hydrogen

iv. Carbon and chlorine

v. Sodium and oxygen

vi. Carbon and oxygen

25. What are polyatomic ions? Give examples . **[2]**

26. What is meant by the term chemical formula? **[2]**

27. Write the chemical formula for **[2]**

a. Calcium Phosphate

b. Magnesium Hydroxide

c. Aluminium chloride.

28. Write down the formulae of: **[2]**

i. sodium oxide

ii. Aluminium chloride

iii. sodium Sulphide

iv. magnesium hydroxide

29. Define Valency? Find the Valency of oxygen and Aluminum. **[2]**

30. An element shows variable valencies 4 and 6. Write the formula of its two oxides. **[2]**

31. Write the molecular formulae of all the compounds that can be formed by the combination of following ions: **[2]**

$Cu^{2+}, Na^{+}, Fe^{3+}, Cl^{-}, SO_4^{2-}, PO_4^{3-}$

Section C

32. Carbon dioxide produced by action of dilute hydrochloric acid on potassium hydrogen carbonate is moist whereas that produced by heating potassium hydrogen carbonate is dry. What would be the difference in the composition of carbon dioxide in the two cases? State the associated law. **[3]**

33. Write down the names of compounds represented by following formulae: **[3]**

i. $Al_2(SO_4)_3$

ii. $CaCl_2$

iii. K_2SO_4

iv. KNO_3

v. $CaCO_3$

Section D

34. Write the formulae for the following and calculate the molecular mass for each one of them. **[5]**

a. Caustic potash

b. Baking soda

c. Limestone

d. Caustic soda

e. Ethanol

f. Common salt

35. Write the chemical formulae of the following: **[5]**

a. Magnesium chloride

b. Calcium oxide

c. Copper nitrate

d. Aluminium chloride

e. Calcium carbonate.

36. Write the molecular formulae for the following compounds: **[5]**

a. Copper (II) bromide

b. Aluminium (III) nitrate

c. Calcium (II) phosphate

d. Iron (III) sulphide

e. Mercury (II) chloride

f. Magnesium (II) acetate

Section E

37. **State True or False:** **[10]**

(a) The valency of silicon and carbon is 3. **[1]**

(b) The valency of calcium is +2. **[1]**

(c) The formula of Phosphorous pentachloride is PCl_3. **[1]**

(d) The chemical formulae of Magnesium sulphide are MgS. **[1]**

(e) The ratio by a number of atoms in mercurous chloride is 1:2. **[1]**

(f) The valency is the combining capacity of an element. **[1]**

(g) The formula of Aluminium chloride is $AlCl_4$. **[1]**

(h) The name of Li_3N is Lithium Nitrate. **[1]**

(i) Element present in Quick lime is Calcium and Magnesium. **[1]**

(j) The formula of Nickel sulphide is NiS_2. **[1]**