



## CHEMISTRY

### BOOKS - ARIHANT PUBLICATION JHARKHAND

## CONCEPT OF ATOMIC MOLECULAR AND EQUIVALENT MASSES

#### Exam Booster For Cracking Exam

1. Scale of atomic mass is

A. C-14

B. C-13

C. C-12

D. All of these

**Answer: C**



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2. Chlorine occurs in nature in the form of two isotopes with atomic mass 35 and 37 in the ratio of 3 : 1 respectively. The average atomic mass of chlorine is

A. 38.5

B. 35.5

C. 36

D. none of these

**Answer: B**



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3. Which of the following has maximum number of atoms?

A. 18 g of water

B. 16g of  $O_2$

C. 4.4 g of  $O_2$

D. 16 g of  $CH_4$

**Answer: D**

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**4.** Atomic mass of an element is

A. actual mass of one atom of the element

B. average relative mass of different atoms of the element

C. relative mass of an atom of the element

D. always a whole number

**Answer: C**

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5. The statement which is wrong about gram atomic mass is

- A. It is the atomic mass expressed in grams
- B. It is also called gram atom
- C. One gram atom of all elements have same number of atoms
- D. One gram atom of an element contain  $6 \times 10^{23}$  atoms

**Answer: C**

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6. Number of atoms present in a molecule is called

- A. mole ratio
- B. molecularity
- C. atomicity
- D. Avogadro's number

**Answer: C**

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7. The mass of an atom of nitrogen is

A.  $\frac{14}{6.023 \times 10^{23}} g$

B.  $\frac{28}{6.023 \times 10^{23}} g$

C.  $\frac{1}{6.023 \times 10^{23}} g$

D. 14u

**Answer: A**

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8. 1 u is equal to

A.  $\frac{1}{12}$  of  $C^{12}$

B.  $\frac{1}{14}$  of  $O^{18}$

C. 1 g of  $H_2$

D.  $1.66 \times 10^{-23} \text{ kg}$

**Answer: A**

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**9. The mass of a molecule of water is**

A.  $3 \times 10^{-26} \text{ kg}$

B.  $3 \times 10^{-25} \text{ kg}$

C.  $1.5 \times 10^{-26} \text{ g}$

D.  $2.5 \times 10^{-25} \text{ kg}$

**Answer: A**

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10. The volume occupied by 4.4 g of  $CO_2$  at STP is

- A. 22.4L
- B. 2.24 L
- C. 0.224 L
- D. 0.1 L

**Answer: B**



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11. Vapour density of a gas is 22. What is its molecular mass?

- A. 33
- B. 22
- C. 44
- D. 11

**Answer: C**



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**12.** How many moles of electrons weigh one kilogram?

A.  $6.023 \times 10^{23}$

B.  $\frac{1}{9.08} \times 10^{31}$

C.  $\frac{6.023}{9.108} \times 10^{54}$

D.  $\frac{1}{9.108 \times 6.023} \times 10^8$

**Answer: D**



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**13.** The number of sulphur atoms in its 40 g is

A.  $40 \times 6.023 \times 10^{23}$



B.  $32 \times 6.023 \times 10^{23}$

C.  $\frac{40 \times 6 \times 10^{23}}{32}$

D.  $\frac{32 \times 6 \times 10^{23}}{40}$

**Answer: C**

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14. Number of electron present in 10 g of  $H_2O$  is

A.  $\frac{6.023 \times 10^{-23}}{6}$

B.  $\frac{6.023 \times 10^{25}}{18}$

C.  $\frac{6.023 \times 10^{22}}{6}$

D. none of these

**Answer: B**

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15. 74 g of a metallic chloride contains 35.5 g of chlorine. The equivalent weight of the metal is

A. 32.73

B. 74.4

C. 35.5

D. 71

**Answer: A**



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16. Approximate atomic weight of an element is 26.89. If its equivalent weight is 8.9, the exact atomic weight of element would be

A. 26.7

B. 8.9

C. 26.89

D. 17.8

**Answer: A**

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17. Equivalent weight of  $KMnO_4$  in acidic medium is

A.  $M/2$

B.  $M/4$

C.  $M/7$

D.  $M/5$

**Answer: D**

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18. Equivalent weight of  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$  is

A. M

B. M/8

C. M/6

D. M/2

**Answer: B**

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19. Equivalent weight of  $Al_2(SO_4)_3$  is

A. M/2

B. M/3

C. M/5

D. M/6

**Answer: D**

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20. Potassium permanganate gives the following reactions in neutral medium  $MnO_4^- + 2H_2O + 3e^- \rightarrow MnO_2 + 4OH^-$  . The equivalent weight of  $KMnO_4$  is (atomic mass of Mn= 55u )

A. 158

B. 79

C. 52.66

D. 31.6

**Answer: C**



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21. Equivalent weight of crystalline oxalic acid is

A. 45

B. 90

C. 126

D. 63

**Answer: D**



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22. What is the equivalent mass of  $KMnO_4$  when it change into  $Mn_2(SO_4)_3$  ?

A. M

B. M/5

C. M/6

D. M/4

**Answer: D**



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23. A g of a metal forms B g of its chloride. The equivalent weight of the metal is given by the relation

A.  $\frac{A}{B - A} \times 35.5$

B.  $\frac{A}{A - B} \times 35.5$

C.  $\frac{B - A}{A} \times 35.5$

D.  $\frac{A}{A + B}$

**Answer: A**



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24. Which of the following is always a whole number?

A. Atomic number

B. Atomic volume

C. Atomic weight

D. None of these

**Answer: A**

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**25.** Molecular weight of a tribasic acid is  $M$ , its equivalent weight is

A.  $M$

B.  $M/3$

C.  $M/6$

D.  $M^3$

**Answer: B**

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**26.** Atomic weight of a trivalent element of equivalent weight 9 is

A. 9



B. 27

C. 18

D. 36

**Answer: B**



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27. An ion is reduced to the element when it absorbs  $6 \times 10^{20}$  electrons.

The number of equivalents of the ion is

A. 0.1

B. 0.01

C. 5

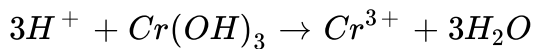
D. 1

**Answer: C**



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28. The equivalent weight of  $Cr(OH)_3$  in the following reaction is



A. 34.3

B. 103

C. 51.5

D. 43.5

**Answer: A**

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29. A metallic oxide contains 60% of the metal. The equivalent weight of the metal is

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30. How many atoms are present in a mole of  $H_2SO_4$  ?

A.  $3 \times 6.02 \times 10^{23}$

B.  $5 \times 6.02 \times 10^{23}$

C.  $6 \times 6.02 \times 10^{23}$

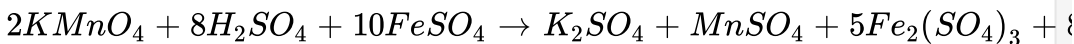
D.  $7 \times 6.02 \times 10^{23}$

Answer: D



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31. In acidic medium,  $KMnO_4$  (molecular weight=158.04) reacts with ferrous ammonium sulphate  $[FeSO_4(.NH_4)_2SO_2.6H_2O]$  (molecular weight 892.14) as follows



The equivalent weight of  $KMnO_4$  is

A. 22.58

B. 31.61

C. 52.68

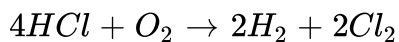
D. 158.04

**Answer: B**



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**32.** A reaction between HCl and  $O_2$  is given by



The equivalent weight of HCl is equal to

A. its molecular weight

B. half of its molecular weight

C. twice of its molecular weight

D. four times its molecular weight

**Answer: A**



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33. 19.7 kg of gold was recovered from a smuggler. How many atoms of gold were recovered (Au = 197)

A. 100

B.  $6.02 \times 10^{23}$

C.  $6.023 \times 10^{24}$

D.  $6.02 \times 10^{25}$

**Answer: D**



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34. Equivalent weight of sulphur in  $S\text{Cl}_2$  is 16. What is the equivalent weight of S in  $S_2\text{Cl}_2$ ?

A. 16

B. 64

C. 32

D. 8

**Answer: C**



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35. What weight of  $SO_2$  can be made by burning sulphur in 5.0 moles of oxygen?

A. 640 g

B. 160 g

C. 80 g

D. 320 g

**Answer: D**



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36. Equivalent weight of a metal is 29.4. It forms metal sulphate isomorphous with epsom salt. The atomic weight of the metal is

- A. 58.8
- B. 14.7
- C. 29.4
- D. 88.2

**Answer: A**



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37. 2 g of oxygen contain number of atoms equal to that contained in

- A. 0.5 g hydrogen
- B. 4.0 g sulphur
- C. 7.0 g nitrogen

D. 2.3 g sodium

**Answer: B**



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**38.** Number of atoms in 4.25 g of  $NH_3$  is (approx.)

A.  $1 \times 10^{23}$

B.  $1.5 \times 10^{23}$

C.  $2 \times 10^{23}$

D.  $6 \times 10^{23}$

**Answer: D**



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39. If the density of water is  $1 \text{ g cm}^3$ , then the volume occupied by one mol of water is approximately

- A.  $18 \text{ cm}^3$
- B.  $22400 \text{ cm}^3$
- C.  $6.03 \times 10^{-23} \text{ cm}^3$
- D.  $3.0 \times 10^{-23} \text{ cm}^3$

**Answer: D**



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40. The equivalent weight of potassium chromate as an oxidising agent in acidic medium is

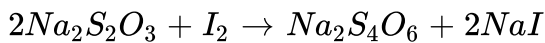
- A.  $\frac{2}{3}$  rd of its molecular weight
- B.  $\frac{1}{3}$  rd of its molecular weight
- C.  $\frac{1}{6}$  th of its molecular weight

D.  $\frac{1}{6}$  half of its molecular weight

**Answer: B**

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**41.** In the reaction



The equivalent weight of  $Na_2S_2O_3$  (molecular weight = M) will be

A. M

B. M/2

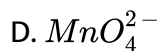
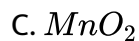
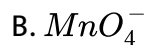
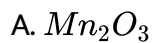
C. 2M

D. 3M

**Answer: A**

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42. The equivalent weight of  $MnSO_4$  is half its molecular weight when it is converted to



**Answer: C**



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43. 2240 mL of  $NH_3$  gas at NTP weight

A. 34.0 g

B. 17.0 g

C. 8.5g

D. 1.7 g

**Answer: D**

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**44.** At NTP 5.6 L of gas has a mass of 60 g. The vapour density of the gas is

A. 30

B. 60

C. 120

D. 240

**Answer: C**

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**45.** Which of the following has largest number of atoms?

A. 71 g of chlorine

B. 48 g of magnesium

C. 127 g of iodine

D. 4g of hydrogen

**Answer: D**

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**46.** The number of moles of  $CO_2$  which contain 16 g of oxygen is

A. 0.25

B. 0.5

C. 1

D. 2

**Answer: B**

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47. Which of the following sets of compounds have their molecular weight and equivalent weight the same?

A.  $\text{KCl}$  and  $\text{BaCl}_2$

B.  $\text{NaCl}$  and  $\text{KCl}$

C.  $\text{MgSO}_2$  and  $\text{NaCl}$

D.  $\text{Hg}_2\text{Cl}_2$  and  $\text{BaCl}_2$

**Answer: B**



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48. 1 g of metal oxide on reduction gives 0.68 g of the metal. The equivalent weight of the metal is

A. 17

B. 32

C. 34

D. 68

**Answer: A**



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**49.** The weight of oxalic acid dihydrate is 126. Its equivalent weight is

A. 36

B. 63

C. 126

D. 252

**Answer: B**



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**50.** Equivalent weight of nitrogen varies in its oxides, because it

- A. contains five electron in its valence orbit
- B. contains half filled p orbitals
- C. is a diatomic molecule
- D. has variable valency

**Answer: B**

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51. The determination of vapour density of a substance is useful to determine

- A. atomic weight
- B. molecular weight
- C. equivalent weight
- D. boiling point

**Answer: B**



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52. A mole of compound is composed of  $6.023 \times 10^{23}$  atoms of hydrogen, 35.5g of chlorine and 48g of oxygen. The compound is

A.  $HClO$

B.  $HClO_2$

C.  $HClO_3$

D.  $HClO_4$

**Answer: D**

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53. 0.45 g of acid (molecular weight 90) was neutralised by 20 mL 0.5 N caustic potash. The basicity of acid is

A. 1

B. 2

C. 3

D. 4

**Answer: B**



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**54.** The amount of zinc for getting 336 mL  $H_2$  from an acid at NTP will be

(Zn = 65)

A. 0.4875 g

B. 6.5 g

C. 0.975 g

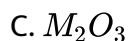
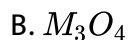
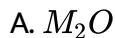
D. 12.6 g

**Answer: C**



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55. 4 g of metal oxide  $M_xO_y$  is reduced by  $H_2$  and 2.4 g metal is obtained, if the atomic weight of metal is 32, the formula of oxide is



**Answer: B**

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56. In Victor Meyer method 0.45 g of a volatile liquid displace 112 cc air at NTP. The molecular weight of liquid is

A. 90

B. 45

C. 25

D. none of these

**Answer: A**



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57. A metal oxide contains 32% oxygen and the vapour density of its chloride is 78.75. The atomic weight of metal is

A. 157.50

B. 17

C. 51

D. none of these

**Answer: C**



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58. Chloride  $MCl_2$  of a metal M contains 52.07% chlorine. Its atomic weight is

A. 38.57

B. 63.35

C. 32.68

D. none of these

**Answer: A**



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59. 1.60 g of metal oxide on heating with H, gives 0.86 g water. The equivalent weight of metal is

A. 35.5

B. 64

C. 32

D. none of these

**Answer: C**



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60. The number of molecules in 19.75 g  $KMnO_4$  is (K= 39, Mn= 55, O=16)

A.  $7.528 \times 10^{22}$

B.  $3.0112 \times 10^{23}$

C.  $6.0224 \times 10^{23}$

D. none of these

**Answer: A**



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61. Haemoglobin is a compound of iron. It contains 0.335% iron. If one molecule of haemoglobin contains four iron atoms its molecular weight will be (Fe = 55.84)

A. 5584

B. 66675

C. 666.75

D. none of these

**Answer: B**



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62. 26 g carbon is burnt and  $CO_2$  formed is absorbed in soda lime and there is an increase of 9.7 g its weight. The equivalent weight of carbon is

A. 8.79

B. 5.86

C. 2.93

D. 4.36

**Answer: C**



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**63.** The specific heat of an element is  $0.031 \text{ cal/g/}^\circ\text{C}$ . 25.9 g of it reacts with 4g  $\text{O}_2$ . The atomic weight of element is

A. 51.8

B. 207.2

C. 103.6

D. None of these

**Answer: B**



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64. The weight of 56 cc of, a gas at NTP is 0.11 g. Its molecular weight is

A. 11

B. 22

C. 33

D. 44

**Answer: D**



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65. Which of the following will contain same number of atoms as 20g of calcium?

A. 12 g Mg

B. 12gC

C. 24 g Mg

D. 32g O

**Answer: A**



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**66.** A metal chloride contains 25.26% metal. Its equivalent weight is

A. 12

B. 24

C. 36

D. 48

**Answer: A**



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