

13. If **ABCDEFGHIJK** is written by graphite pencil, it weighs 3.0×10^{-10} g. How many carbon atoms are present in it? ($N_A = 6 \times 10^{23}$)
 (a) 1.5×10^{13} (b) 5×10^{12}
 (c) 2×10^{33} (d) 1.5×10^{10}
14. The atomic masses of two elements P and Q are 20 and 40, respectively. If 'a' g of P contains 'b' atoms, how many atoms are present in '2a' g of Q?
 (a) a (b) b
 (c) 2a (d) 2b
15. The molecular formula of a compound is X_4O_9 . If the compound contains 40% X, by mass, what is the atomic mass of X?
 (a) 24 (b) 12
 (c) 26 (d) 13
16. A quantity of 1 g of metallic carbonate XCO_3 is completely converted into a chloride XCl_2 weighing 1.11 g. The atomic mass of the element 'X' is
 (a) 10 (b) 20
 (c) 30 (d) 40
17. An element, X, have three isotopes X^{20} , X^{21} and X^{22} . The percentage abundance of X^{20} is 90% and its average atomic mass of the element is 20.18. The percentage abundance of X^{21} should be
 (a) 2% (b) 8%
 (c) 10% (d) 0%
18. A sample of hydrogen gas is collected and it is observed that it contains only hydrogen and deuterium atoms in the atomic ratio 6000:1. The number of neutrons in 3.0 g of such a sample should be nearly
 (a) 0.0005
 (b) 3.01×10^{20}
 (c) 1.80×10^{24}
 (d) 1.0
19. If isotopic distribution of C^{12} and C^{14} is 98.0% and 2.0%, respectively, then the number of C^{14} atoms in 12 g of carbon is
 (a) 1.032×10^{22}
 (b) 1.20×10^{22}
 (c) 5.88×10^{23}
 (d) 6.02×10^{23}
20. The fractional abundance of Cl^{35} in a sample of chlorine containing only Cl^{35} (atomic weight = 34.9) and Cl^{37} (atomic weight = 36.9) isotopes, is 0.6. The average mass number of chlorine is
 (a) 35.7 (b) 35.8
 (c) 18.8 (d) 35.77

Molecular Mass

21. Twenty molecules of SO_3 will weigh as much as molecules of oxygen.
 (a) 100 (b) 50
 (c) 15 (d) 8
22. The mass of CO_2 that must be mixed with 20 g of oxygen such that 27 ml of a sample of the resulting mixture would contain equal number of molecules of each gas
 (a) 13.75 g
 (b) 27.50 g
 (c) 41.25 g
 (d) 55 g
23. A mixture of 2×10^{21} molecules of P and 3×10^{21} molecules of Q weighs 0.60 g. If the molecular mass of P is 45, the molecular mass of Q will be ($N_A = 6 \times 10^{23}$)
 (a) 45 (b) 180
 (c) 90 (d) 270
24. The shape of tobacco mosaic virus (TMV) is cylindrical, having length 3000 Å and diameter 170 Å. If the specific volume of virus is 12.5 ml/g, the molecular mass of TMV is ($N_A = 6 \times 10^{23}$)
 (a) 3.28 (b) 5.44×10^{-24}
 (c) 5.44×10^{-18} (d) 3.28×10^6