Recent JEE [2021-2025]

30. Which has maximum number of atoms? **(2003, 1M)**

(a) 24 g of C (12) (b) 56 g of Fe (56)

(c) 27 g of Al (27) (d) 108 g of Ag (108)

31. How many moles of electron weighs 1 kg? **(2002, 3M)**

(a) 6.023×10^{23} (b) $\frac{1}{9.108} \times 10^{31}$

(c) $\frac{6.023}{9.108} \times 10^{54}$ (d) $\frac{1}{9.108 \times 6.023} \times 10^{8}$

32. The largest number of molecules is in **(1979, 1M)**

(a) 36 g of water

(b) 28 g of CO

(c) 46 g of ethyl alcohol

(d) 54 g of nitrogen pentaoxide (N_2O_5)

33. The total number of electrons in one molecule of carbon dioxide is **(1979, 1M)**

(a) 22 (b) 44 (c) 66 (d) 88

34. A gaseous mixture contains oxygen and nitrogen in the ratio of 1:4 by weight. Therefore, the ratio of their number of molecules is **(1979, 1M)**

(a) 1 : 4 (b) 1 : 8 (c) 7 : 32 (d) 3 : 16

35. The ratio mass of oxygen and nitrogen of a particular gaseous mixture is 1 : 4. The ratio of number of their molecule is **(2014 Main)**

(a) 1 : 4 (b) 7 : 32 (c) 1 : 8 (d) 3 : 16

36. 5 moles of AB_2 weight 125×10^{-3} kg and 10 moles of A_2B_2 weight 300×10^{-3} kg. The molar mass of $A(M_A)$ and molar mass of $B(M_B)$ in kg mol^{-1} are **(2019 Main, 12 April I)**

(a) $M_A = 10 \times 10^{-3}$ and $M_B = 5 \times 10^{-3}$

(b) $M_A = 50 \times 10^{-3}$ and $M_B = 25 \times 10^{-3}$

(c) $M_A = 25 \times 10^{-3}$ and $M_B = 50 \times 10^{-3}$

(d) $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$

37. The weight of 1×10^{22} molecules of $CuSO_4 \cdot 5H_2O$ is ..... . **(1991, 1M)**

38. The total number of electrons present in 18 mL of water is ..... . **(1980, 1M)**

39. The modern atomic mass unit is based on the mass of ..... . **(1980, 1M)**

40. 20% surface sites have adsorbed N_2. On heating N_2 gas evolved from sites and were collected at 0.001 atm and 298 K in a container of volume is 2.46 cm^3. Density of surface sites is $6.023 \times 10^{14}/cm^2$ and surface area is 1000 cm^2, find out the number of surface sites occupied per molecule of N_2. **(2005, 3M)**

41. A plant virus is found to consist of uniform cylindrical particles of 150 Å in diameter and 5000 Å long. The specific volume of the virus is 0.75 cm^3/g. If the virus is considered to be a single particle, find its molar mass. **(1999, 3M)**

42. **2021 (01 Sep Shift 2)**

The number of atoms in 8 g of sodium is $x \times 10^{23}$.

The value of x is ____. (Nearest integer)

[Given : $N_A = 6.02 \times 10^{23}$ mol^{-1}

Atomic mass of Na = 23.0u]

43. **- 26 July - Shift 2** (2022)

Hemoglobin contains 0.34% of iron by mass. The number of Fe atoms in 3.3 g of hemoglobin is :

(Given : Atomic mass of Fe is 56 u, N_A in 6.022×10^{23} mol^{-1})

(A) 1.21×10^5 (B) 12.0×10^{16}

(C) 1.21×10^{20} (D) 3.4×10^{22}

44. **- 25 June - Shift 1** (2022)

The number of N atoms is 681 g of $C_7H_5N_3O_6$ is $x \times 10^{21}$. The value of x is ____ ($N_A = 6.02 \times 10^{23}$ mol^{-1}) (Nearest Integer)

45. Match List-I with List-II

	List-I		List-II
A	16 g of CH_4 (g)	I	Weighs 28g
B	1 g of H_2(g)	II	60.2 × 10^{23} electrons
C	1 mole of N_2 (g)	III	Weighs 32g
D	0.5 mol of SO_2(g)	IV	Occupies11.4 L volume at STP

Choose the correct answer from the options given below:

[2023 (10 Apr Shift 2)]

(1) A-II, B-III, C-IV, D-I

(2) A-II, B-IV, C-I, D-III

(3) A-I, B-III, C-II, D-IV

(4) A-II, B-IV, C-III, D-I

46. The number of molecules and moles in 2.8375 litres of O_2 at STP are respectively

[2023 (10 Apr Shift 1)]

(1) 7.527×10^{23} and 0.125 mol

(2) 7.527×10^{22} and 0.250 mol

(3) 1.505×10^{23} and 0.250 mol

(4) 7.527×10^{22} and 0.125 mol

46. . 2.8×10^{-3} mol of CO_2 is left after removing 10^{21} molecules from its ' x ' mg sample. The mass of CO_2 taken initially is Given: $N_A = 6.02 \times 10^{23}\ mol^{-1}$ JEE 2025

(1) 98 .3 mg

(2) 48.2 mg

(3) 196 .2 mg

(4) 150 .4 mg

47. **- 2024 (30 Jan Shift 1)**

0.05 cm thick coating of silver is deposited on a plate of 0.05 m^2 area. The number of silver atoms deposited on plate are _____ $\times 10^{23}$. (At mass Ag = 108, d = 7.9 g cm^{-3})