47. From 2 mg calcium, 1.2×10^{19} atoms are removed. The number of g-atoms of calcium left is (Ca = 40)

(a) 5×10^{-5}
(b) 2×10^{-5}
(c) 3×10^{-5}
(d) 5×10^{-6}

48. The number of g-molecules of oxygen in 6.023×10^{24} CO molecules is

(a) 1 g-molecule
(b) 0.5 g-molecule
(c) 5 g-molecules
(d) 10 g-molecules

49. Equal masses of oxygen, hydrogen and methane are taken in identical conditions. What is the ratio of the volumes of the gases under identical conditions?

(a) 16:1:8 (b) 1:16:2
(c) 1:16:8 (d) 2:16:1

50. A pre-weighed vessel was filled with oxygen at NTP and weighed. It was then evacuated, filled with SO_2 at the same temperature and pressure, and again weighed. The weight of oxygen is

(a) the same as that of SO_2
(b) $\frac{1}{2}$ that of SO_2
(c) twice that of SO_2
(d) $\frac{1}{4}$ that of SO_2

Average Molecular Mass

51. Molecular mass of dry air is

(a) less than moist air
(b) greater than moist air
(c) equal to moist air
(d) may be greater or less than moist air

52. At room temperature, the molar volume of hydrogen fluoride gas has a mass of about 50 g. The formula weight of hydrogen fluoride is 20. Gaseous hydrogen fluoride at room temperature is therefore, probably a mixture of

(a) H_2 and F_2
(b) HF and H_2F_2
(c) HF and $H_{2.5}F_{2.5}$
(d) H_2F_2 and H_3F_3

53. A gaseous mixture contains 70% N_2 and 30% unknown gas, by volume. If the average molecular mass of gaseous mixture is 37.60, the molecular mass of unknown gas is

(a) 42.2
(b) 60
(c) 40
(d) 50

54. The mass composition of universe may be given as 90% H_2 and 10% He. The average molecular mass of universe should be

(a) 2.20 (b) 2.10
(c) 3.80 (d) 3.64

55. A quantity of 10 g of a mixture of C_2H_6 and C_5H_{10} occupy 4480 ml at 1 atm and 273 K. The percentage of C_2H_6 by mass, in the mixture is

(a) 30% (b) 70%
(c) 50% (d) 60%

56. The density (in g/l) of an equimolar mixture of methane and ethane at 1 atm and 0°C is

(a) 1.03 (b) 2.05
(c) 0.94 (d) 1.25

57. 'n' mol of N_2 and 0.05 mol of Ar are enclosed in a vessel of capacity 6 l at 1 atm and 27°C. The value of 'n' is ($R = 0.08$ l atm mol^{-1} K^{-1})

(a) 0.25
(b) 0.20
(c) 0.05
(d) 0.4