28. A sample of protein was analysed for metal content and analysis revealed that it contained magnesium and titanium in equal amounts, by mass. If these are the only metallic species present in the protein and it contains 0.016% metal, by mass, the minimum possible molar mass of the protein is (Mg = 24, Ti = 48)

(a) 6,00,000
(b) 1,50,000
(c) 3,00,000
(d) 12,00,000

29. One mole of mixture of N_2, NO_2 and N_2O_4 has a mean molar mass of 55.4 g. On heating to a temperature, at which all the N_2O_4 may be dissociated into NO_2, the mean molar mass tends to a lower value of 39.6 g. What is the mole ratio of N_2, NO_2 and N_2O_4 in the original mixture?

(a) 5:1:4 (b) 1:1:1
(c) 1:4:5 (d) 1:5:4

30. A protein, isolated from a bovine preparation, was subjected to amino acid analysis. The amino acid present in the smallest amount was lysine, $C_6H_{14}N_2O_2$ and the amount of lysine was found to be 365 mg per 100 g protein. What is the minimum molecular mass of the protein?

(a) 40,000,000 (b) 40,000
(c) 40 (d) 4,00,000

31. Cupric ammonium sulphate was found to contain 27.03% water of crystallization, by mass. Upon strongly heating, it gave cupric oxide corresponding to 19.89% of starting mass. Find the empirical formula of cupric ammonium sulphate. (Cu = 63.5)

(a) $CuSO_4 \cdot (NH_4)_2SO_4 \cdot 6H_2O$
(b) $CuSO_4 \cdot (NH_4)_2SO_4 \cdot 5H_2O$
(c) $CuSO_4 \cdot 2(NH_4)_2SO_4 \cdot 6H_2O$
(d) $CuSO_4 \cdot (NH_4)_2SO_4 \cdot 8H_2O$

32. A drug, marijuana, owes its activity to tetrahydrocannabinol, which contains 70 per cent as many carbon atoms as hydrogen atoms and 15 times as many hydrogen atoms as oxygen atoms. The number of moles in a gram of tetrahydrocannabinol is 0.00318. Determine its molecular formula.

(a) CH_3O_2 (b) $C_{21}H_{30}O_2$
(c) $C_{15}H_{30}O_2$ (d) $C_{70}H_{15}O$

33. How many millilitres (at 0°C and 1 atm) of hydrogen sulphide are needed to precipitate cupric sulphide completely from 100 ml of a solution containing 2.69 g of $CuCl_2$ in a 1 l solution? (Cu = 63.5)

(a) 448 (b) 4.48
(c) 22.4 (d) 44.8

34. When the hydrocarbon propane is burned in air, carbon dioxide and water are formed. If 0.15 mol of CO_2 is produced, how many drops of water will be formed, assuming one drop is 0.05 cm^3 and contains 1.70×10^{21} water molecules?

(a) 1.2×10^{23} (b) 4
(c) 53 (d) 70

35. When a hydrocarbon is burnt completely, the ratio of masses of CO_2 and H_2O formed is 44:27. The hydrocarbon is

(a) CH_4 (b) C_2H_6
(c) C_2H_4 (d) C_2H_2

36. An aqueous ammonium sulphate solution containing 50 moles of solute reacts with excess of calcium hydroxide. How many litres of a solution (specific gravity 0.85) containing 20% by mass of ammonia can be prepared using this reaction?

(a) 10.0 L (b) 8.5 L
(c) 20.0 L (d) 17.0 L

37. Specialized cells in the stomach release HCl to aid digestion. If they release too much, the excess can be neutralized by antacid tablets. Which of the following should be more effective active ingredient of antacid tablets?

(a) $Mg(OH)_2$ (b) $Al(OH)_3$
(c) $Ca(OH)_2$ (d) H_2SO_4