**67.** A mixture of formic acid and oxalic acid is heated with conc. $H_2SO_4$. The gaseous product is passed into KOH solution where the volume decreased by $1/6^{th}$. What was the molecular proportion of the organic acids, formic and oxalic acid, in the mixture?

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

**68.** A volume of 50 ml of a gas mixed with 70 ml of oxygen gave after explosion 50 ml of $CO_2$ and after absorption by KOH, 45 ml of oxygen are left. What is the molecular formula of the gas?

(a) $CH_4$
(b) $C_2H_4$
(c) CO
(d) $C_2H_2$

**69.** A human patient suffering from a duodenal ulcer may show a concentration of HCl of $80 \times 10^{-3}$ molar in gastric juice. If his stomach receives 3 l of gastric juice per day, how much medicine (antacid syrup) containing 2.6 g of $Al(OH)_3$ per 100 ml must he consumes per day to neutralize the acid?

(a) 27 ml
(b) 80 ml
(c) 240 ml
(d) 120 ml

**70.** When $V$ ml of 2.2 M – $H_2SO_4$ solution is mixed with $10V$ ml of water, the volume contraction of 2% takes place. The molarity of diluted solution is

(a) 0.2 M
(b) 0.204 M
(c) 0.196 M
(d) 0.224 M

**71.** A quantity of 23.6 g of succinic acid is dissolved in 500 ml of 0.1 M acetic acid solution. Assuming that neither acid is dissociated in solution, calculate the molarity of '–COOH' in the solution.

(a) 0.3 M
(b) 0.5 M
(c) 0.9 M
(d) 0.8 M

**72.** Chlorofluorocarbons such as $CCl_3F$ (M = 137.5) and $CCl_2F_2$ (M = 121) have been linked to ozone depletion in Antarctica. As of 2004, these gases were found in 275 and 605 parts per trillion ($10^{12}$), by volume. What are the concentrations of these gases under conditions typical of Antarctica stratosphere (200 K and 0.08 atm)? ($R$ = 0.08 l-atm/K-mol)

(a) $[CCl_3F] = 1.375 \times 10^{-12}$ mol $l^{-1}$, $[CCl_2F_2] = 3.025 \times 10^{-12}$ mol $l^{-1}$
(b) $[CCl_3F] = 2.75 \times 10^{-14}$ mol $l^{-1}$, $[CCl_2F_2] = 6.05 \times 10^{-14}$ mol $l^{-1}$
(c) $[CCl_3F] = 2.75 \times 10^{-10}$ mol $l^{-1}$, $[CCl_2F_2] = 6.05 \times 10^{-10}$ mol $l^{-1}$
(d) $[CCl_3F] = 1.375 \times 10^{-13}$ mol $l^{-1}$, $[CCl_2F_2] = 3.025 \times 10^{-12}$ mol $l^{-1}$

**73.** A quantity of 1 kg of 2m urea solution is mixed with 2 kg of 4 M urea solution. The molality of the resulting solution is

(a) 3.33 M
(b) 10 M
(c) 3.29 M
(d) 5 m

**74.** A quantity of 1 kg of 1 M glucose solution is diluted to 5 kg. The molality of the diluted solution should be

(a) 0.2 M
(b) 0.02 M
(c) 0.207 M
(d) 0.175 M

**75.** A quantity of 500 g of a urea solution of mole fraction 0.2 is diluted to 1500 g. The mole fraction of solute in the diluted solution is

(a) 0.05
(b) 0.067
(c) 0.6
(d) 0.1