ANS

1. $\%C\,(v/v) = \frac{\text{V of solute}}{\text{V of solution}} \times 100\%$

$= \frac{36\,\cancel{mL}}{208\,\cancel{mL}} \times 100\%$

$= \boxed{17.3\%}$

2. a) $\%C\,(v/v) = \frac{\text{V of solute}}{\text{V of solution}} \times 100\%$

$27\% = \frac{x}{200mL} \times 100\%$

this means

$\frac{27mL}{100mL} \times 100\% = \frac{x}{200mL} \times 100\%$

$\frac{27mL}{100mL} \times \frac{\cancel{100\%}}{\cancel{100\%}} = \frac{x}{200mL} \times \frac{\cancel{100\%}}{\cancel{100\%}}$

$\frac{27mL}{100mL} = \frac{x}{200mL}$

$x = \frac{200mL \times 27\,\cancel{mL}}{100\,\cancel{mL}}$

$x = \boxed{54mL}$

b) Volume of solution = Volume of solute + Volume of solvent

$200mL = 54mL + x$

$x = 200mL - 54mL = \boxed{146mL}$

3. $C = \frac{m}{V}$ $\quad 600\,\text{mL} \times \frac{1\,\text{L}}{1000\,\text{mL}} = 0.6\,\text{L}$

$m = C \times V$

$m = 37\,\text{g/L} \times 0.6\,\text{L}$

$m = \boxed{22.2\,\text{g}}$

4. $C = \frac{m}{V}$

$V = \frac{m}{C} = \frac{13\,\text{g}}{23\,\text{g/L}} = \boxed{0.57\,\text{L}}$

5. $C = \frac{m}{V}$ $\quad 120\,\text{mL} \times \frac{1\,\text{L}}{1000\,\text{mL}} = 0.12\,\text{L}$

$C = \frac{18\,\text{g}}{120\,\text{mL}} = \boxed{0.15\,\text{g/mL}}$ or $C = \frac{18\,\text{g}}{0.12\,\text{L}} = \boxed{150\,\text{g/L}}$

6. a) $\frac{50\,\text{g}}{700\,\text{mL}} = 0.072\,\text{g/mL}$

b) $0.2\,\text{kg} \times \frac{1000\,\text{g}}{1\,\text{kg}} = \frac{200\,\text{g}}{1000\,\text{mL}} = 0.2\,\text{g/mL}$

c) $2\,\text{L} \times \frac{1000\,\text{mL}}{1\,\text{L}} = 2000\,\text{mL}$ $\quad \frac{300\,\text{g}}{2000\,\text{mL}} = 0.15\,\text{g/mL}$

ANS: $\boxed{\text{A, C, B}}$

7. $\frac{C_1}{C_2} = \frac{V_2}{V_1}$

$\frac{40\,g/L}{C_2} = \frac{300\,mL}{100\,mL}$

$C_2 = \frac{100\,mL \times 40\,g/L}{300\,mL}$

$C_2 = \boxed{13.\overline{3}\,g/L}$

8. $\frac{C_1}{C_2} = \frac{V_2}{V_1}$

$\frac{30\%}{14\%} = \frac{200\,mL}{V_1}$

$V_1 = \frac{14\% \times 200\,mL}{30\%}$

$V_1 = \boxed{93.\overline{3}\,mL}$

b) $200\,mL - 93.\overline{3}\,mL = \boxed{106.7\,mL}$

9. $\frac{C_1}{C_2} = \frac{V_2}{V_1}$

$\frac{15\%}{C_2} = \frac{250mL}{150mL}$

$C_2 = \frac{150\cancel{mL} \times 15\%}{250\cancel{mL}}$

$C_2 = \boxed{9\%}$