Q.1 (a)

The dimensions of each term must be the same, so $V = V_0 + at + \frac{x}{t}$ where each term has the unit of LT^{-1}.

Q.2 (b)

$$v^2 = cx \Rightarrow c = \frac{v^2}{x} = \frac{L^2T^{-2}}{L} = LT^{-2} \equiv \boxed{m/s^2}$$

Q.3 (a)

$$\vec{A} = 10\cos 30^\circ \hat{i} + 10\sin 30^\circ \hat{j} = 8.7\hat{i} + 5\hat{j}$$

$$\vec{B} = 5\cos 60^\circ \hat{i} + 5\sin 30^\circ \hat{j} = 2.5\hat{i} + 4.35\hat{j}$$

$$R_x = 2 * 8.7 + 2.5 = \boxed{19.9}$$

Q.4 (b)

$$\vec{T} = (8.7 + 2.5)\hat{i} + (5 + 4.35)\hat{j} + 5\hat{k}$$

$$|\vec{T}| = \sqrt{237.8} = \boxed{15.4}$$

Q.5 (b)

$\vec{B}$ is in the x-y plane, while $\vec{C}$ is in z-direction. This means they are <u>perpendicular</u> to each other.

Q.6 (b)

$$\vec{A} \times \vec{C} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 8.7 & 5 & 0 \\ 0 & 0 & 5 \end{vmatrix} = \hat{i}(25) - \hat{j}(43.5) + 0$$

$$= \boxed{25\hat{i} - 43.5\hat{j}}$$

Q.7 (d)

$$\bar{v} = \frac{x_1 + x_2 + x_3}{t_1 + t_2 + t_3} = \frac{5*60 + 10*90 - 10*30}{180} = \boxed{5\ m/s}$$