Qu. 9

For each condition we can calculate the 'constant'

p (kPa)	v (m/s)	h (m)	$\frac{p}{\rho g} + \frac{v^2}{2g} + h$
200	5	0	$\frac{200\times10^3}{1000\times9.81} + \frac{5^2}{2\times9.81} + 0 = 21.662$
101	11.1	4.2	$\frac{101\times10^3}{1000\times9.81} + \frac{11.1^2}{2\times9.81} + 4.2 = 20.775$

In percentage terms taking the first set of readings the error as a percent is given by:.

$$\frac{20.775 - 21.662}{21.662} \times 100\% = \underline{\underline{-4.1\%}}$$

Each term has the dimension of length or height and does in fact represent the fluid energy

(pressure/flow, kinetic, potential).

When fluid flows in a duct it encounters friction and therefore some of its energy is dissipated as heat.

The model is for frictionless flow but measurements indicate the effect of friction (which is not too large).