ANSWERS

1 B
2 B
3 D
4 D
5 B
6 C
7 A
8 A

9 $P_{gas} = P_{atmosphere} + 18$ cmHg
$P_{gas} = 76$ cmHg + 18 cmHg
$P_{gas} = 94$ cmHg

10 (a) 0 mmHg

(b) Pressure at base of hill = 76 cmHg
Pressure at top of hill = (70 – 10) = 60 cmHg

Pressure difference between top & bottom of hill = 76 – 60 = 16 cm Hg

16 cmHg of pressure = 0.16 x 13600 x 10 = 21760 Pa

Cause of pressure difference is H metres of air (H is the height of the hill)

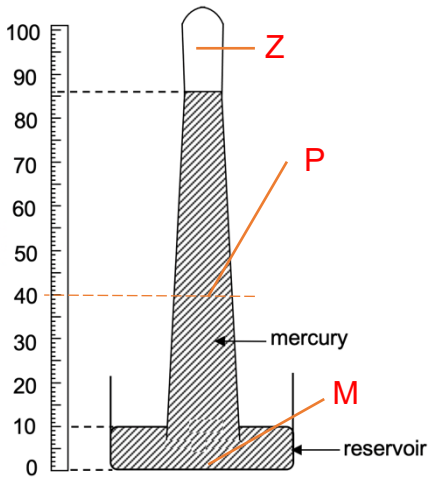
21760 = h ρ g = H x 1.3 x 10

H = 1670 m

(c) Air will flow INTO the mercury column as the pressure of the outside air (atmospheric pressure) is greater than the pressure of the mercury at that point.

11 (a) atmospheric pressure = 86 – 10 = 76 cmHg

(b)



12 (a) Atmospheric pressure is due to the force per unit area exerted against a surface by the weight of the atmosphere above that surface. The S.I. unit is **pascal** (Pa) or **newton per square metre** (N m^{-2}).

(b)(i) A & D, B & C

(b)(ii) Since the pressure at point B = the pressure at point C
using $P = h \rho g$, $(9.0\ cm)(8.20\times10^{2}\ kg\ m^{-3}) = J\ (1.00\times10^{3}\ kg\ m^{-3})$
J = <u>7.4 cm</u> (2 s.f.)

(c)(i) $F/A = 0.017\ N / \pi\ (6 \times 10^{-3}\ m)^2$ = <u>150 Pa</u>

(c)(ii) Since the pressure at point B = the pressure at point C using $P = h \rho g$
$150\ Pa + (0.090\ m)(8.20\times10^{2}\ kg\ m^{-3})(10\ N\ kg^{-1}) + (0.028\ m)(1.00\times10^{3}\ kg\ m^{-3})(10\ N\ kg^{-1})$
$= (K\ m)(1.00\times10^{3}\ kg\ m^{-3})(10\ N\ kg^{-1})$
$K = 0.1168\ m$ = <u>0.117 m</u>