**Paper 1 232/1 marking scheme**

1. Fig.

2a. mercury has a higher density than water

b.i. V = vacuum

ii. P = h eg = 1.36 X $10^{4}$ x 10 x 0.7

 = 95, 200 N/m²

3.Fig (a) cohesive forces are greater than adhesive force while fig (b) adhesive forces are greater than cohesive forces.

4. -120 + 273 = 153 K

5. gases have weak intermolecular forces and long intermolecular distance while solid have strong intermolecular forces and short inter molecular distance

6. F = K e

e 1 = $\frac{f}{k}$ = $\frac{50.2}{300}$ = 0.167m

e2 = $\frac{f}{k}$ = $\frac{75.05}{300}$ = 0.25 m

total extension = 0.417 m

7a. principle of moment states that for a system in equilibrium the sum of clockwise moment at a point is equals to the sum of anticlockwise moment about the same point

b. Sum of clockwise moment = sum of anticlockwise moment

2 x 0.1 = 0.35 w

W = $\frac{0.2}{0.35}$ = 0.5714 N

8.The pith ball is lifted /rises /moves upwards

-Air at high speed creates low pressure region at the mouth of the bottle

-The pressure difference lifts the ball upwards.

9. Elastic collusion is a collision where both momentum are conserved while inelastic collusion is a collusion where only a momentum is conserved.

10. density / temperature

11. fig.

12. shinny/ silvered glass surface

13a. action and reaction/ forces are equal and opposite.

b. U = 50mls V = 0 mls

$v^{2}$ = $u^{2}$ + 2as

$o^{2}$ = $50^{2}$ + 2 x (-2) s

$\frac{-2500}{-4}$ = $\frac{-4}{-4}$

a= - 2m/s²

s = 625 M

c. i. I = $V\_{AB}$ = $\frac{-1.5}{0.02 x 4}$ = 18.75m/s

II = $V\_{CD}$ $\frac{3.2}{0.02 x 4}$ = 40 m/s

ii). a= $\frac{V-u}{t}$ = $\frac{40-18.75}{0.02 x 1.7}$ = $\frac{21.25}{0.34}$

= 62.5 cm/s ²

d. F = $\frac{mv²}{r}$

F = $\frac{2.4 x 16²}{1.2}$

F = 512N

14. pressure Law – pressure of a fixed mass of a gas is directly proportional to the absolute temperature at a constant volume.

b. i. Temperature

pressure

ii. fill a table of temperature and corresponding pressure

Plot a graph of pressure against temperature

The graph is a straight line showing that p < T

c. $\frac{P1 V1}{T1}$ = $\frac{P2 V2}{T2}$

$\frac{2400x 2.4}{32.7}$ =$\frac{300 x 6}{T2}$

T2 = 102.2 k

15a i. V.R =$\frac{1}{\sin(30)}$ = ½

ii. W.o = 300 x 2 = 600J

iii. W. I = 200 x 4 = 800J

iv. efficiency = $\frac{w.o}{w.I}$ x 100 % = $\frac{600}{800}$ x 100%

= 75 %

b. fig.

16a. Archimedes principle state that when a body is partially or fully immersed in a fluid it experiences up thrust equal to weight of fluid displaced.

b. fig.

c. i. U = UA + UB

U = V eg

UA = $\frac{4 x 5 x 1.5 x 1000 x 10}{1000000}$ = 0.3

UB = $\frac{4 x 2.5 x 0.8 x 1000}{1000,000}$ x 10 = 0.08

U = 0.3 + 0.08 = 0.38

ii. Upthrust = Weight of the floating object = 0.38 N

e = $\frac{M}{V}$ = $\frac{0.038}{80}$ x 1000 000

e = 475 kg/m³

17. hf = this is the quantity of heat required to change a unit mass of a substance from solid to liquid at a constant temperature.

B i. = MIf

= $\frac{10}{1000}$ x 3.34 x 10 = 3340J.

ii. = MI Cw ø

= $\frac{10}{1000}$ x 42000 (T – O)

= 42T

Iii. Mw Cw Æ + Me Cc ø

0.25 x 42 (65 –T) + 0.08 x 900 (65 – T)

68 250 – 1050 + 4680 – 72 T

=72930 – 1122T

iv. 3340 + 42T = 72930 – 1122T

42 T + 1122T = 72930 – 3340

$\frac{1164 T}{1164 }$ = $\frac{69590}{1164}$

T = 59.79˚C