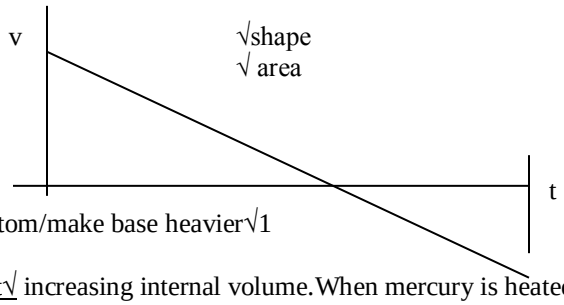
PHYSICS SCHOOL BASED EXAM –MARKING SCHEME

1)Reading indicated = 2.4 +(8 x 0.01)
= 2.48 cm√
Error - 0.05cm
Actual reading 2.48
+0.05
2.53cm√

2.



√shape
√ area

3. Add weight at bottom/make base heavier√1

4.Glass expands first√ increasing internal volume.When mercury is heated it expands faster than glass.

5.(a) V.R = 6 ✓①

(b) $M.A = \frac{800}{2+2} = 2.941$ ✓①

n = $\frac{M.A}{V.R} \times 100 = \frac{2.941}{6} \times 100$ ✓①

= 49.01% ✓①

(c) (i) Loudspeaker ✓①

(ii) Motor ✓①

6)More air is pumped into the tyre. The **number of** particles **colliding with the walls** increases. the increase in the rate of change of momentum , hence the force per unit area increase.√

7). (a) A collision in which objects combine / fuse, losing kinetic energy in the process.

(b) Final momentum = Initial momentum(0.5 + 1.5) V = (1.5 x 1.2) + (0.5 x 0.2)
2.0V = 1.8 + 0.1
2.0V = 0.9
V = 0.95 m/s

8). - Convection takes place in air upwards direct due to density effect √1
Convection requires material medium but the space between the sun and the atmosphere has no material medium.

9).Extention in A=6+1=4.667m Extention in B and C= 6 =2.0m

1.5 2x1.5

Total extension =6.667m

10.Has higher density thus height is reduced in mercury.√
Does not vaporize easily.√1 Any one correct

11. Clockwise moments = Anticlockwise moments√

$W \times 0.4 = 2X\ 0.1$√

$W = \frac{0.2}{0.4}$

$W = 0.5$ N

Upward force = downward force.

$T = 2 + 0.5$

$T = 2.5$ N√

SECTION B (55 Mrks)

12(a)

(i) $V = \omega r$√

$V = 6\pi \times 1.5$

$= 6 \times 3.142 \times 1.5$

$= 28.278$m/s √

(ii) At A

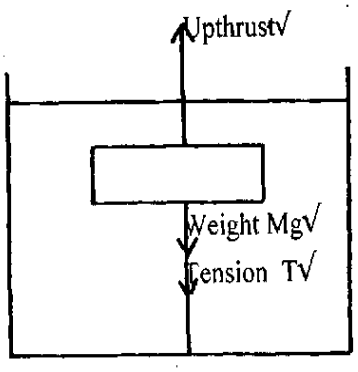
$\frac{Mv^2}{r} = T_A + mg$ √1

$\therefore T_A = \frac{mv^2}{r} - mg = \frac{0.45(28.28)^2}{1.5} - 0.45x10$

$=235.43$N

13) (a) A floating body displaces its own weight of the fluid in which it floats. √1

(b) (i)



Correct direction of forces must be indicated.

(ii) $U = mg + T$ √1mk

(c) (i) Upthrust = weight of solid √1

$= \ell vg$

$=$ 800kg/m3 x (115 x 10-6)m^3 x 10N/Kg√

$= 0.092$N √

(ii) Weight of liquid displaced = upthrust

$\rho vg = 0.92$ √

$\rho = \frac{0.092}{(8.5 \times 10^{-6}) \times 10}$

=1082 kg/m3

14. (a)(i) –length of air column √

- temperature of the water √

(ii) –a set of readings of length of air column and corresponding temperature obtained √

- a graph of length of air column (volume) against temperature is plotted.

- a straight line graph is obtained showing that V ά T √

14(b)Heat gained by ice=Heat lost by water

(0.04x340000)+(0.04x4200Q)=0.4X4200(20-Q)

13600+168Q=33600-1680Q

Q=10.82 C

(c) The pressure acting on the bubble reduces as the depth/height below liquid surface reduces. √

(d) Temperature at which a gas will occupy zero volume. √

15). (i) Work done = mgh ✓ (2mks)

= 30 ×10 × 10 = 3000J ✓

(ii) Work by force 100N = FS (2mks)

$$= 100 \times \frac{10}{Sin\,15^{o}} \quad \checkmark$$

= 100 × 38.6370

= 3863.70J ✓

(iii)Efficiency $= \frac{Work\ output}{Work\ input} \times 100\%$ ✓ (3mks)

$$= \frac{3000}{3863.7} \times 100\% \ \checkmark$$

= 77.57% ✓

(iv) Work done in overcoming friction = 3863.7 – 3000

= 863.7J ✓(1mk)

(v)

V.R= 1/Sin15

=3.864

Efficiency = $\frac{M.A}{V.R} \times 100\%$

77.57 = $\frac{M.A}{V.R} \times 100$ ✓ (3mks)

M.A = 0.7757 ×3.864

=2.997

16(a) Is a gas that obeys the gas laws completely.;

(b) (i) By carrying out the experiment in a room (where temp. is constant);

(ii) $k = \frac{\Delta P}{\Delta 1/v}$

$= \frac{(4.0 \times 10^5) - (0)}{(4.85 \times 10^6) - (0)}$

$= 4 \times 10^{-1}$

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$= 0.8247 \times 10^{-1}$

$= 8.247 \times 10^{-2}$ Nm

(iii) energy/work done

(iv) allow air to adjust to room temperature;

17(a) $\frac{V_1}{T_1} = \frac{V_2}{T_2}$

$\frac{4000}{310} = \frac{V2}{340}$

$V_2 = \frac{4000 \times 340}{310}$

= 4387 litres

17(b) MV-MU=Ft

0.6v-0=720x0.1

V=120m/s

17(c) Upthrust in liquid = 1.04 – 0.72 = 0.32N√1
Upthrust in water = 1.04 – 0.64 = 0.40√1
Density of liquid = $1000 Kgm^{-3} \times 0.32 = 0.8 \times 10^3 Kgm^{-3}$√1
0.40√1