MARKING SCHEME 232/1

PAPER 1

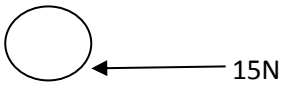
SECTION A: (25MARKS)

1. 4 .50

   +0.48 2mks

   4.98mm√

   4.98+0.06=5.05mm√

2. 

   1mk

   The length should be equal to 1.5cm to represent 15N

3. Low temperature reduces K.E velocity of molecules√

   This lowers the rate of collision therefore reducig pressure√ 2mks

4. On heating, the bimetallic strip bends√, this causes the position of the centre of gravity of the section to the left to shift to the right causing imbalance and so tips to the right√

   2mks

5. $W=\frac{1}{2}Ke^2$ e=30.24=6cm

   $=\frac{1}{2}x2x(0.06)^2$√ 2mks

   $=3.6x10^{-3}$ J√

6. $A_1V_1=A_2V_2$√ 3mks

   $\pi x6^2XV_1=\pi x9^2x2$ √

   V_1=4.5m/s√

7. Water does not conduct heat to the bottom√ 1mk

8. 1. To compare the rate of diffusion of gases.]√

   2. The level of water drops in arm A and rises in arm B of the U-tube√

   3. The H_2 gas particles, being smaller than air particles, diffuse into the pot faster than air diffuses out. The gas pressure inside the pot increases pushing the liquid in arm A downwards.√ 3mks

9. Volume of the bottle=$\frac{40g}{0.8g/cm^3}$ =50cm^3√

   3mks

   Density of the liquid=$\frac{(86-26)g}{50cm}$ √

   =1.2g/cm^3

10. It is the study of light of as it traverses various media.√ 1mk

11. Perpendicular distance from point support √ 1mk

12. As the temperature changes, the volume of the gases in the balloons change differently. √The change in volume and hence change in upthrust will differ√ 2mks

13. P=FXv

    200W=400v √ 2mks

    V=0.5m/s √

14. **SECTION B** 1mk

(a) A body remains in a state of rest or uniform motion in a straight line unless acted upon by an external force.√ 2mk

    The car stops√

(b) car has a lower momentum compared to the bus√

1. U=20m/s V=0m/s t=10s

(c) a=$\frac{v-u}{t}$ √

=$\frac{0-20}{10}$ =-2m/s^2

$V^2=U^2+2as$ √

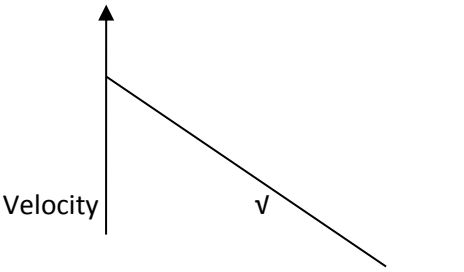
$0=20^2+(2x-2xs)$

-4no=-4s

S=100m√

(ii) The policeman will not be hit (car stops 145-100m) away from policeman.√

d 1mk



3mks

(e)(i) Time

t=$\frac{2u}{g}$ √

=$\frac{2X1s}{10}$√

(ii)

=3.5seconds√

2mk

H=$\frac{u^2}{2g}$ √

$=\frac{15x15}{2\times10} = \frac{225}{20}$ √

=11.25m√

15.(a) Angular velocity is the rate of change of angular displacement with time√ 1mk

(b) F_r=umg

(i) u=$\frac{Fr}{Mg}=\frac{1.2}{2}$ √ 2mks

u=0.6√

(ii) $F_c=F_r$

3mks

1.2=$\frac{mr^2}{R}$√

$v^2=\frac{1.2r}{m} =\frac{1.2\times0.09}{0.2}$√

V^2=0.54

V=0.73m/s√

(iii) ω=$\frac{V}{R} =\frac{0.73}{0.09}$ √ 4mks

=8.16rad/s√

New ω=8.16=(3.14x2)

=14.44rad/s

F=mω^2r

=0.2x$(14.44)^2$x 0.09√ 1mk

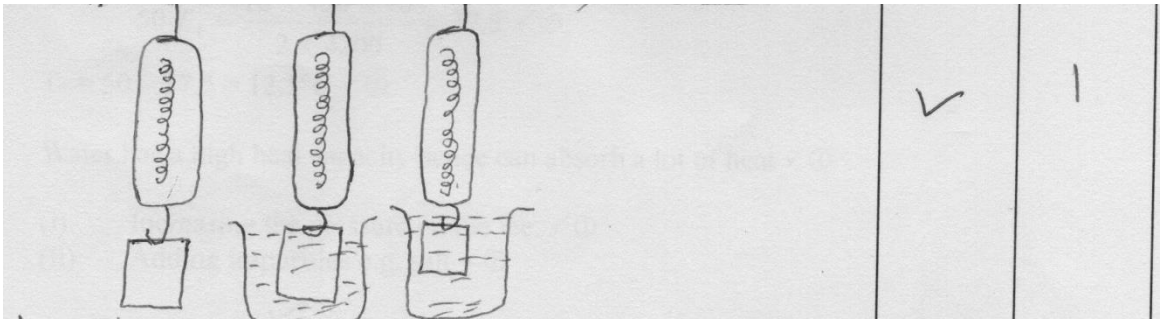
=3.75N√

(c)

Raising the load from the outlet side of the bend√

16. (a) A body fully of partially immersed in a fluid experiences an upthrust equal to the weight of the fluid displaced. 1

(b)

(i)  1

Weight in air

100g: { Uw=0.12 vs=0.09N }

15o: √ { Uw=0.18N vs=0.14N }√√ 2

(ii) 200g: Uw=0.2N vs=0.18

(iii) Relative density=$\frac{upthrust\ in\ spirit}{upthrust\ in\ water}$√

3

Average =$\left(\frac{0.09}{0.12}+\frac{0.14}{0.18}+\frac{0.18}{0.24}\right)$√

=0.76√

17. (a) (i) Increasing the surface area of the liquid.√ 1

(ii) Reducing the pressure on the liquid surface√ 1

(b) Heat gained by water =Heat lost by metal blocks

$M_wC_wO_w=M_mC_mO_m$√ 3

2X4200x(50-T1)=10X450x70

50***T***1=$\frac{10\times450\times70}{2\times4200}$ √

=37.5√

T_1=50-37.5=12.5^{0}C√

(c) Water has a high specific heat capacity hence can absorb a lot of heat.√ 1

(d) (i) Increasing the pressure on the ice.√

(ii) Adding impurities e.g salt√ 2

(e) As ether evaporates,√ it extractts the latent heat of vaporazation from its surroundings hence the water is cooled.√ 2

(g)

Heat	Temperature	
- Form of energy which flows from a hotter to a cooler part of an object	- Degree of hotness or coldness of an Of an object measured on a given scale	Any 2
1. Measured in joules	2. Measured in Kelvin or ^{o}C.	
3. Measured using a calorimeter	4. Measured using a thermometer	

18. (a)

1. $P=\frac{F}{A}$

$=\frac{20}{0.0005}$√

=40x10^{4}N/m^2√ 2

2. $P=\frac{F}{A}$

$\boldsymbol{A}=\frac{F}{P}=\frac{5000}{4\times10^4}$√

= 250m^2√

The 3rd mark will only be scored if the first 2 are correct.

(iii)V.R=$\frac{\pi R^2}{\pi r^2}$

$=\frac{0.125}{0.0005}$√

= 250√

(iv) Volume of liquid that leaves the master cylinder√

=volume of liquid that enters the slave cylinder

Distance moved by effort X cross section area of master cylinder

=Distance moved by slave cylinder X cross section area of the slave cylinder

VR=$\frac{Distanc\ moved\ by\ effort}{distance\ movedd\ by\ load}$ = $\frac{cross\ area\ of\ slave\ \ cylinder}{cross-section\ area\ of\ master\ cylinder}$√

VR=$\frac{\pi R^2}{\pi r^2}$

= $\frac{R^2}{r^2}$√

55
MARKS