**MARKING SCHEME PHYSICS PAPER 232/1**

**ARISE AND SHINE**

**FORM FOUR TRIAL 1 EXAMINATION-MARCH APRIL 2023**

**SECTION A**

1. Volume of water displaced = 100 – 60 = 40cm3√

Volume of water displaced = Vol.of stone = 40cm3

P = $\frac{M}{V}$ (do not award a mark for the formula)

P = $\frac{567g}{4ocm^{3}}$ = 14.175g/cm3 (correct substitution)√

P = 14.18g/cm3

1. The ball expands when heated and cannot go through the ring√, but when left on the ring for some time is heats the ring causing the ring to expand hence it passed through√.
2. Clockwise moments = Anticlockwise moments

300 x 1.5 = X x 650√ (correct substitution 1mk)

$\frac{450}{650}$ = $\frac{650x}{650}$

 X = $\frac{450}{650}$√

X = 0.6923M (at least 2dp)√

1. Water rises up the glass tube√

Hydrogen diffuses out the porous pot faster than air diffusing into the pot creating√ partial vacuum (low pressure) hence atmospheric pressure pushes water upwards

1. Pressure decreases with increase in speed/pressure increases with decreases in speed
2. Upthrust = weight of water displaced by the metal

Wt of water displaced = wt in air – wt in water - (3-2) = 1N

Mass of water displaced = $\frac{1}{10}$ = 0.1kg

 Density of water = 1000kgm-3

Vol.of the water displace $\frac{0.1}{1000}$ = 0.001m3

Therefore vol. of metal = 0.001m3

1. He sucks the air in the straw reducing the pressure inside the straw√ 1. The greater atmospheric pressure outside pushes the liquid into the mouth√
2. Clean water has a high surface tension addition of detergent reduces/breaks/lowers the surface tension√1
3. Each spring experiences a force of $\frac{30}{2}$ = 15N

F = ke√ e = $\frac{F}{k}$ = $\frac{15}{3}$ = 5cm

Each spring extends to 5cm√

10 To reflect the outwards or inwards hence reduce heat loss by radiation

11. (a) Hold wax to prevent it from floating

(b). Floating wax heat reaches it by convection current (hot water rises)

**SECTION B**

12. (a) (i). Velocity√

 (ii). B√ it moves with a lower velocity√ has less momentum.

(b) (i). V2 = u2+ 2as√

 502 = 302+ 2 x 5s√

2500 = 900 + 105

.$\frac{105}{10}$ = $\frac{1600}{10}$

 S = 160m√

(ii) F= m $\left(\frac{v-u}{t}\right)$√

F = $\frac{2000}{1000}\left(\frac{0-50}{5}\right)√$

F = -20N√

c). For a system of colliding bodies the linear momentum is conserved provided no external force acts.

d). i) P = mu√

= 100 x 20

= 2000 kg m/s√

e) ii) 2000 kg m/s√

iii) (m1 + m2)v = p√

(100 + 20) v = 2000

120v = 2000

V = 16.67ms√

13. a) Pressure√ decreases with decrease in √depth

 b ) i) pressure law, pressure and temperature√ varies

ii) -Volume√

* Mass√

iii) Even distribution of heat√

c) .$\frac{P\_{I}V\_{I}}{T\_{I}}$ = $\frac{P\_{2V\_{2}}}{T\_{2}}$

3x106x1.5= p2x3

 20+273 273+5

P2 = 1.423 x 106pa

d). gases are made up of molecules which are in a constant random motion.

14.a)(i) H = pt

 = 2.5 x 1000 x 1 x 60

 =150 000 J

ii) mC$θ=H$

2 x 4200 x $θ $= 150000

 .$ θ$ = 17.86k

b) It evaporates by absorbing latent heat of vaporization

c). It evaporates easily

d)

|  |  |
| --- | --- |
| **Boiling** | **Melting** |
| 1. Pressure increases the boiling point
2. Boiling is change of state from liquid to gas
 | 1. Pressure reduces the melting point
2. Its change of state from solid to liquid
 |

15.a) V.R = $\frac{distance moved by effort}{distance moved by load }√$

 = $\frac{L}{h}$√

But sin$ a= \frac{h}{L}∴\frac{1}{\sin(a)}$ = $\frac{L}{h}$ √

 V.R = $\frac{1}{\sin(a)}$

b)(i) $ η$ = $\frac{MA}{VR}$ x 100%$√$

72% = $\frac{MA}{\frac{1}{\sin(30)}}$ x 100%$√$

 72 = $\frac{MA }{2}$x 100

MA = 1.44

MA $\frac{L}{E}√$

1.44 = $\frac{50 x 10}{E}$

 E = 347.22N$ √$

II) Work done against function = (100 – 72) % of work input

= 28% of E x dE√

= $\frac{28}{100}$ x 347.22 x 4 sin 30$√$

= 194.44J$√$

16.a) gravitational force

b) II) FR = m$ω^{2}$r$√$

 0.2 = $\frac{50}{1000}ω^{2}$ x $\frac{10}{1000}√$

 .$w^{2}$ = 40

. $ω=6.325 rad/s√$

II)$ ω$ = $\frac{2π}{T}$

 6.325 = 2 x $\frac{22}{\frac{7}{T}}√$

 T = 2 x $\frac{22}{7}$ x $\frac{1}{6.325}$

 T = 0.9938s$√$

ii)

c) 1. Increase the radius of rotation

 2. Reduce the angular velocity/speed of rotation