ASUMBI GIRLS HIGH SCHOOL

POST -MOCK 1

AUGUST/SEPTEMBER

2022

**PHYSICS PAPER 1 MS**

**SECTION A (25 MARKS)**

1. (a)



(b)

 3.68 – 0.03

 =3.65mm

1. Marble rolls down because brass contracts more than iron.
2. Gases are compressible
3. Adhesive forces between water molecules and glass beaker are stronger than cohesive forces between water molecules hence resultant force makes water to form a concave meniscus. Cohesive forces between mercury molecules are greater than adhesive forces between mercury molecules and glass beaker hence resultant force makes mercury form a convex meniscus.
4. 0.7 x 13600 x 10 = h x 1000 x 10

 h= 9.52m

1. Volume flux = AV

 Volume = 3.142 x 102  x 5 x 10-6

 Volume flux = 3.142 x 3.142 x 10-4 x 5 = 4.936 x 10-3 m3/s

1. For a system in equilibrium; Moment = Fd

 Sum of clockwise moments = sum of anticlockwise moments

 (30 x 0.1) + (2 x 0.1) = (20 x 0.1) + (x x 0.3)

 6.2 – 2 = 0.3x

 x = 14N

1. V

 (m/s)

 t (s)

1. The papers bulge outwards away from each other. This is due to the pressure outside reducing below atmospheric pressure hence resultant outward force.
2. Weight of water displaced ( upthrust)

 U = WA – WW V = 0.5 W = ρvg

 = 2.5 – 2.0 1000 x 10 ρ = W

 = 0.5 N V = 5 x 10-5  m3 vg

 W = ρvg Volume of water = Volume of ρ = 2.5

 V = W displaced stopper 5 x 10-5 x 10

 ρg ρ = 5000kg/m3

1. -Temperature

-Mass

1. Increase in cross-section area increases the number of free electrons per unit length which are responsible for thermal conductivity.
2. The size of the molecules is negligible.

 Intermolecular forces are negligible.

1.

**Mechanical**

**advantage**

 load

1. (a) The number of collisions per unit time will increase due to an increase in molecules of the gas per unit volume. Hence, the rate of change of momentum increases with the increase in number of collisions per unit time increase pressure.

 (b) The volume of a fixed mass of a gas is directly proportional to its absolute

 temperature if the pressure is kept constant

 (c) V1  = V2 V2 = 200 x 353

T1 T2  293

V2=V1 T2  V2 = 240.96cm3

T1

 (d) (i) The volume of air at closed end decreases since more mercury exerts greater

 pressure resulting into reduction in volume

 (ii) Adding the mercury slowly / in little amounts to let the pressure change be slow

 (e) (i) Methane will liquify before zero volume is reached / methane is a real gas. Boyle`s

 law applies for an ideal gas

 (ii)

 Pressure

 Volume

1. (a)
2. Periodic time = 1 = 0.2 s

 f

 = 1

 5

1. w = 25c+

 = 2 x 3.142 x 5

 = 31.42 rads-1

1. Linear velocity = distance V = 2 x 3.142 x 0.7 x 5 = 21.99ms-1

 time 15

 C = 2πr

1. T = mg + mv2

 r

 = (0.04 x 10) + 0.04 x (21.99)2  = 28.03N

 0.7

 (b)

1. time = 1 second; t = 4 seconds

gradient = (45 – 5 )m (60 – 50)m

 (2 – 0)s (4.25 – 2)s

 = (40) ms-1

 2 = 4.444m/s

 = 20ms-1

1. a = v – u a = -5.185ms-2

 t

= (4.444 – 20)ms-1

 (4 – 1)s

1. (a) When a body is partially or totally immersed in a fluid, it experiences an upthrust equal to the weight of the fluid displaced.

(b)



 -Tie the piece of metal with the spring and suspend it in air.

- Record its weight W1.

 - Fill Eureka can with water until it flows out freely through the spout.

 - Weigh an empty beaker. Put the beaker under the spout and immerse the metal

 partially in water.

* Wait until dripping stops and weigh the beaker with its contents.
* Record the weight of partially immersed piece of metal W2.
* Remove the object (metal) from water and repeat the experiment with a re-filled Eureka can and empty

 beaker (now piece of metal partially immersed.) Record weight W3.

(c) Weight of hydrometer = weight of water displaced

 W = mg W =ρvg V = Ah

 (0.015 x 10) = 1000 x 2 x 10-4 x h x 10

 1000 x 20 x 10-4 1000 x 20 x 10-4

 h = 0.075m

(d)

1. Upthrust = weight of air displaced

 W = vρg

 = 200 x 1.2 x 10

 = 2400N

1. (a) Adding impurities

 Application of pressure

 (b) (i)



* Arrange the apparatus as shown in the set up
* Switch on the immersion heater and start your stop watch. Note reading of ammeter and the corresponding voltmeter reading.
* After a reasonable amount of water has been collected, stop the stopwatch and note the time taken to heat the ice
* determine the mass of water collected.
* Use the equation VIt = mLf  to determine Lf

 c) (i) H = Cθ

 = 40 JK-1 x (34 – 25) K

 = 360 J

1. H = mcθ

= 0.1 x 4200 x 9

= 3780 J

1. 360 + 3780 = 4140 J
2. $c= \frac{Q}{mθ}$

$$c= \frac{4140}{0.15 x (100-34)}$$

$$c=418.18 J/kgK$$