**MWAKICAN COMMON EXAMINATION**

**Kenya Certificate of Secondary Education**

**PHYSICS Paper 1**

**232/1 March/April 2014**

Marking scheme

1. Main scale = 5.5mm

Thimble scale = 0.22mm

 5.72mm (1mk)

1. Cohesion forces between water molecules are stronger than adhesion forces between water and air molecules. (1mk)
2. P=Phg

$\frac{750}{1000}$×13600×g=1000×h×g

h=75 x 136

 1000

 =10.2m. (3mks)

1. Gas molecule are far apart as compared to liquid molecules.(1mk)
2. Steel and concrete have the same rate of expansion(Linear expansivity) (1mk)
3. Where temperature rise(fire) the bimetallic strip bends downwards since brass expands faster than iron. Contact is made, current flows and the bell rings.(3mks)
4. Spring constant for A & B =150 x2=300

 e1 =$\frac{F}{K}$ = $\frac{1000}{300}$ = 0.033 m

 e = $\frac{1000}{150}$ = 0.067

Total extension = 0.33 + 0.067 = 3mks

 0.10m

1. Metalic chair is a good conductor of heat.It conducts the heat away hence the cooling effect.(1mk)

 0.4 –x k x 0.4

 5N 2N

 8N

1. Clockwise moments=Anticlockwise moments

(5 × x)+ 2(0.4 + x) = 8(0.4 – x)

5x + 0.8 + 2x = 3.2 – 8x. (3mks)

 $\frac{15x}{15 }$ = $\frac{2.4}{15 }$

x =0.16m

0.4 – x = 0.4 – 0.16

=0.24m.

1. Volume of rod in water = 16cm2 x 10cm=160cm3

Volume of liquid displaced =160cm3

Weight of liquid displace = 160 x 10-6  x 1000 x 10 (evg)

 =1.6N.

By Law of floatation, weight of rod = weight of fluid displaced

 = 1.6N.

1. Velocity of air inside the tube increases, which results to a corresponding decrease in pressure.

Atmospheric pressure pushes the paper inwards.(3 mks)

1. The vehicle and pass angers are travelling at the same velocity. When the vehicle is stopped, the passengers tend to remain in uniform motion in a straight line (Inertial) (2mks)

**SECTION B(55MKS)**

1. a)For a fixed mass of a gas, pressure is inversely proportional to the volume at constant temperature.(1mk)

b)i)P1 760 mmHg

 P2 = 760 + 240 =1000Hg.

 V1 = Au = V1 L1= 240mm.(A is uniform )

P1L1 P2L2

760 x 240 = 1000 xL2

L2 = 760 x 240

 1000

= 182.4 mm.

ii. P1L1 = P3L3.

L3 = P1L1 = 760 x 240

P3 520

= 350.77mm.

c.P1V1 = P2V2

 T1 T2

2.5 x 105 x 3000 = 2.2 x 105 x V2

 298 288

V2 =2.5 x105 x 3000 x 288

 298 x 2.2 x 105

3294 .69 cm3

1. a.Speed is a scaler quantity while velocity is a vector quantity or speed is the rate of change of distance with time while velocity is the rate of change of displacement with time.

b. I OA – the body is moving with uniform acceleration.

IIAB –Velocity of the body is constant uniform.

III.CD-the body is decelerating uniformly to rest.

Distance =Area under the graph.

Area=½ (4+8)10 + ½(10 + 15) 2 + ½x 13.5 x 15

= 60 +25+

101.25m.

c.t=$\frac{1}{f}$ = $\frac{1}{50 }$ = 0.025

1. VAB = $\frac{1.5}{0.04}$ = 37.5 cm/s (3mks)

VCD = $\frac{3.2}{0.06}$ = 53.33 cm/s

1. A =$\frac{v-u }{l }$ = $\frac{53.33-37.5}{0.13}$ = $\frac{15.83}{0.13 }$ (2mks)

121.77 cm/s2

(Are 6.5 ticks)

1. a.The efficiency of a machine is the ratio of workout put to the work input.

(Any other acceptable definition is 02)

 b.V.R =$\frac{1}{SinӨ }$=$\frac{1}{sin}$Ө = 2(2mks)

c.Efficiency= $\frac{MA}{VR}$

 $\frac{MA}{2}$=$\frac{75}{100}$

 MA =$\frac{75 X 2}{100}$ = 1.5

MA =$\frac{L}{E}$ 1.5 $\frac{900}{E}$

 E=600N.

1. a.Specific latent heat of fusion is the heat energy required to change a unit mass of a substance from solid to liquid. State without change in temperature.(1mk)

b.i)heat absorbed by ice = MLf

=$\frac{40}{1000}$ x 334000J

=13360J (2mks)

ii)Heat absorbed by melted ice = MCO

 $\frac{40}{1000}$ x 4200 x(T.O)

 =168T (2mks)

 iii)

Heat lost by colorimeter = $\frac{160}{1000}$ x 900x(60-T)

 8640 – 144T

Heat cost by water $\frac{400}{1000}$ x 4200 x(60 –T)2

 100800 – 1680T(3mks)

iv)Heat lost = Heat gained

 109440 – 1824 T = 168 T + 13360(3mks)

 1992T = 96080

T= 48.230C.

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

b(i)V=rw

w = $\frac{v}{r}$ = $\frac{3.0}{1 }$ = 3 rods-1 (2mks)

1. T = Fa = $\frac{mv}{r}$ = 0.2 x 32

1.0

=1.8N.(2mks)

iv) –C = y intercept

 = 0.18N.

c)i) Table 1

|  |  |
| --- | --- |
| Angular velocity w(rods-1) | 2.0 3.0 4.0 5 .0 6.0 |
|  Tension T(N) | 0.04 0.34 0.67 1.30 1.90 |
| W2 | 4.0 9.0 16.0 25.0 36.0 |

ii)T =GRAPH ON SEPARATE SHEET

Axis-Questions with units (1mk)

Scale –simple & uniform (1mk)

Plotting - ½x 4 points (1mk)

Line 1mk)

T = mrw2 c(Compare with y = mx + c)

Slope =mr

=1.1-0.4

 22-10

Mx 0.3 = 0.7

=$\frac{0.7}{12}$

M x 0.3 = $\frac{0.7}{12 x 0.3}$ = 0.194kg.

Iv.-c=y intercept

 = 0.18 N.