**FORM FOUR END OF TERM 2 EXAMINATION**

**Kenya Certificate of Secondary Education (K.C.S.E)**

**232/1**

**PHYSICS**

**PAPER 1**

**MARKING SCHEME**

1. -Reading = 2.32 cm (1 mk)

-Actual reading = 2.32 cm - 0.06cm = 2.26 cm ( 1 mk)

2. a) vacuum reduces heat transfer (gain or loss) by conduction and convection. ( 1mk)

-There is absence of material medium in the vacuum while both conduction and convection regquires a material medium( 1 mk)

3. -The metal bench ( 1 mk)

-The metal is a better conducrtor of heat than wood, it therefore conducts heat away from the body faster than the wood (1 mk)

4. -The stability reduces/decreases /lowers(1 mk)

-The position of center of gravity is raised because more mass is added to the upper part. (1 mk)

5. -Let the weight of the pan be x

Mass = 200g

Extension = 32 – 15 = 17 cm

K1 =

=

Mass = 250g

Extension = 35 – 15 = 20 cm

K2 =

= ( 1 mk) For both k1 and k2

K1 = k2 since springs are identical

= ( 1 mk)

X = 0.833333333 N

Mass of the pan

W = mg

m =

m = 0.08333 kg ( 1 mk)

m = 83.33 g

6. -This is when the upwards forces equals the downwards forces(1 mk)

-The net ( resultant) force is zero/ the acceleration is zero ( 1 mk)

7. - Gases have larger intermolecular distances than in solids and in liquids

8. -pressure of the gas, Pg= Pa+ hρg (1 mk)

hρg = X 13600 X 10

= 27,200N/m2 (1mk)

Pg= 103360 + 27200

= 130,560 N/m2 (1 mk)

9. -The bulb of the thermometer is heated first and expands, the level of the mercury falls. ( 1mk)

-Later, the mercury in the bulb is heated and expands more than the bulb, this makes the level of mercury to rise. ( 1 mk)

10. clockwise moments = anticlockwise moments

OR F1d1= F1d1 ( 1 mk)

24 x 50 = 16( 100 – x) ( 1 mk)

1200 = 1600 – 16x

X = 25 cm ( 1 mk)

11. =

T1 = 27 + 273 = 300K

T2 = 67 + 273 = 340K

P1  = P2 since pressure is constant

= (1mk)

= (1mk)

V2 = 226.67 ml ( 1 mk)

12. a) a floating object displaces its own weight of the fluid in which it floats. 1mk

b) i) U = Vρg ( 1 mk)

= X X X 800 X 10 ( 1 mk)

= 3.2 N ( 1mk)

ii) density =

W = 3.2 N since the object is floating

m =

=

= 0.32 kg or 320 g ( 1 mk)

Density = ( 1 mk)

=

= 0.4 g/cm3( 1 mk)

OR V = X X

= 8.0 X 10-4 m3

Density =

= 400 kg/ m3

c) put some sand into the testtube. ( 1mk)

put some water into the beaker about full.

Dip the testtube with its contents into the water in the beaker.

Mark the level of water on the testtube as 1. ( maximum). ( 1 mk)

Pour the water from the beaker and replace it with kerosene about full.

Dip the testtube with its contents into the kerosene in the beaker. Mark the level of kerosene on the testtube as 0.8 ( minimum). ( 1 mk)

Divide the interval in equal divisions to read relative densities in that range. ( 1 mk)

13. a) Mechanical advantage is the ratio of Load to Effort. 1mk. Reject formula M.A=L/E

1. i) V.R = ( 1 mk)

V.R =

( 1 mk)

- if the effort gear makes 1 revolution, the load gear makes **P/Q** revolutions.

V.R = ( 1 mk)

V. R =  **Q/P**

ii) V.R = Q/P

P = 10

Q = 30

V.R =

= 3 ( 1 mk)

M. A =

=

= 2.25 ( 1 mk)

Efficiency = X 100

= X 100

= 75 % ( 1 mk)

(Working of efficiency must be shown)

1. Work done by the system = F X d

= 1800 X 0.8

= 1440 J

Efficiency = X 100 ( 1 mk)

75 = X 100 ( 1 mk)

X = X 1440

X = 1080 J ( 1 mk)

14. i) -increasing the speed of rotation/increasing the rate of whirling/increasing frequency of rotation. (1 mk)

-reducing the radius of the circular path. ( 1mk)

ii) – weight of the object ( 1mk)

- Tension in the string. ( 1mk

Velocity

iii)

Force

1. There is change in the direction of the velocity because the direction of motion of the object changes with time. ( 1 mk)
2. I) f = 3 Hz

Ѡ = 2πf ( 1 mk)

= 2 π X 3 ( 1 mk)

= 6 π

= 18.85 rad/s ( 1 mk)

II) T = mr Ѡ2 + mg ( 1 mk)

= 0.2 X 18.85 X 18.85 X 1.2 + 0.2 X 10

( 1 mk)

= 85.2774 + 2

= 87.28 N ( 1mk)

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

b) i) I) mass of condensed steam

= 264 – ( 150 + 100)

= 264 – 250

= 14 g ( 1 mk)

II) H = mccc∆θ + mwcw∆θ

= X 400 X 50 + X 4200 X 50

( 1 mk) ( 1 mk)

= 2000 + 31500

= 33500 J ( 1mk)

ii) heat lost = heat gained

heat lost by steam = X L + X 4200 X 32

( 1 mk)

= 0.014 L + 1881.6 ( 1 mk)

0.014L + 1881.6 = 33500 ( 1 mk)

0.014L = 31618.4

L =

= 2,258,457.143 J /kg ( 1 mk)

1. – impurities (1 mk)

- pressure ( 1 mk)

16. a) i) V = U + gt

V = 0 + 10 X 2.5

= 25 m/s ( 1 mk)

ii) V2 = U2 + 2gs

25 X 25 = 0 x 0 + 2 X 10 X h

20h = 625

h = 31.25 ( 1 mk)

iii) V2 = U2 + 2as

0 X 0 = 25 X 25 + 2 X a X 0.125

0 = 625 + 0.25a

a = - 2500m/s2 ( 1 mk)

retardation = 2500 m/s2 ( 1 mk)

b) for a system of colliding bodies, the total linear momentum remains constant provided no external forces are acting. ( 1 mk)

c) – use of rollers

- use of ball bearings

- lubrication ( oiling or greasing )

( any two for 2 mk)