**NAME:………………………………………………………INDEX NO:……………………**

**SCHOOL:…………………………………………………..DATE: ......................................**

 **SIGN:…………………**

**232/1**

**PHYSICS**

**PAPER 1 (THEORY)**

**March/ April 2016**

**TIME: 2 HOURS**

**ELERAI PRE – MOCK EXAMINATIONS - 2016**

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

**PHYSICS PAPER 1**

**2 HRS**

**INSTRUCTIONS TO CANDIDATES**

* *Write your* ***name****,* ***index number*** *and* ***school*** *in the spaces provided above.*
* *This paper consist of* ***two*** *sections;* ***A*** *and* ***B***
* *Answer* ***all*** *the questions in the spaces provided*
* *All working* ***must*** *be clearly shown.*
* *Mathematical tables and electronic calculators may be used*
* **Take g = 10m/s2**

*This paper consists of 12 printed pages. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.*

 **SECTION A** (25 MARKS)

 *Answer* ***ALL*** *the questions in this section in the spaces provided.*

1.A student determined the volume of a stone by displacement method and collected the water in a measuring cylinder.Figure 1shows the levels shown when the experiment was repeated four times

0

1

2

(ii)&(iv)

Figure 1

­(i)&(iii)

3

Volume in cm3

State the reading the student should record (2marks)

2.Figure 2 shows an object whose length is being determined using vernier calipers

5

6

4

Figure2

0

10

5

Object

Object

7

Determine the length of the object (1mark)

3.State two contact forces (2marks)

4.Figure3 shows an arrangement used to determine the lung pressure of a per

water

130cm

Open tube

Figure3

10cm

Given that atmospheric pressure is 100000Pa and the density of water is 1gcm-3determine the lung pressure.(3marks)

5.Explain the solid state of matter in terms of particles.(2marks)

6. Figure 4 shows a flashing indicator of a car

Switch

battery

bulb

contacts

Bimetallic strip

Heating coil

Figure 4

Explain how the flashing unit works. (3marks)

7.Give a reason why a vest keeps a person warm even though it is a collection of holes bounded by string. (1mark)

8. Two men are about to trim a tree. One man on a ladder cuts the tree at point A while the other man **pulls o**n a rope at point B or C as shown in figure 5

A

rope

B

C

Figure5

Platform

Suggest with a reason location B or C that the man pulling would use less force (2marks)

9.Figure 6 shows a portable bathroom

Compacted soil

Polythene

Perforated pipe

Polythene

Figure 6

Explain why it is safe to use such a bathroom (2marks)

10.Figure 7 shows a uniform horizontal bar of negligible kept in equilibrium by a mass hanging from a spring and a 30N force

30N

Mass M

spring

25cm

40cm

Figure 7

If the spring has negligible weight,stretches by 20cm and obeys Hooke’s law determine the spring constant of the spring (3marks)

11.Explain why a strong wind is more likely to blow off the roof of a house but may not blow off the roof of a car with open windows (2marks)

12.Figure 8 shows the displacement-time graph for the motion of a particle

Displacement(m)

30

20

10

0

Time (s)

4

3

2

1

Figure 8

State the value of acceleration of the particle (1mark)

13.State Newton’s first law of motion (1mark)

14.Figure 9 shows an elastic band being used to throw a stone

Figure 9

Elastic band

Describe the energy transformations that take place from the beginning to when the stone is released. (1mark)

 **SECTION B** (55 Marks)

*Answer* ***ALL*** *Questions in this section in the space provided below each Question*

15(a)Define specific latent heat of vaporization (1mark)

(b)Figure10 shows an arrangement that may be used to determine the specific latent heat of vaporization of water

Boiling water

Heat

Water

Thermometer 2

Thermometer 1

Figure 10

stirrer

Calorimeter

(i)State the reason why thermometer 1 is not placed in boiling water (1mark)

(ii)What is the purpose of the stirrer in this experiment? (1mark)

(iii)In a similar experiment the following measurements were recorded:

Temperature of steam=950C

Initial temperature of water and calorimeter=200C

Final equilibrium temperature of contents in calorimeter=800C

Initial mass of water in calorimeter=50g

Mass of calorimeter=70g

Final mass of calorimeter and its contents=126g

Specific heat capacity of calorimeter=400Jkg-1K-1

Specific heat capacity of water=4200Jkg-1k-1

Write an expression for

I Heat lost by steam and condensed steam (2mark)

II Heat gained by water and calorimeter (1mark)

IIIDetermine the specific latent heat of vaporization of steam (2marks)

IV State two sources of error in the experiment (2marks)

(c)What mass of cold water at 150C must be added to 60kg of hot water at 80 0C by someone who wants to take a bath at 400C?(Neglect heat losses) (3marks)

16(a) Define the term **angular velocity** (1mark)

(b)A body moving with uniform angular velocity is found to have covered an angular distance of 200 radians in **t** seconds. Twenty five seconds later it is found to have covered a total angular distance of 450 radians. Determine **t** (3marks)

 (c) A satellite of mass 6000Kg is an orbit a distance of 41600Km from the centre of the earth. If its speed is 750Kmh-1 determine the satellite’s;

 (i) Angular speed (3marks)

 (ii)Period (3marks)

 (iii)Centripetal force (3marks)

17(a) State pressure law of gases (1mark)

(b)Figure 11 shows a fixed mass of dry gas enclosed in a tube.The temperature is initially 170C.

Gas volume V

Atmospheric pressure

110mm

Mercury

Figure 11

 Mercury

(i)Given that the atmospheric pressure is 760mmHg what is the pressure of the gas in the tube? (2marks)

(ii)What will the pressure become if the temperature is raised to 470C and the volumeV of the gas is kept constant by raising the right hand tube? (3marks)

(iii)What is now the difference between the mercury levels in the two tubes? (2marks)

18(a)State the law of floatation (1mark)

(b)A hot air balloon is tethered to the ground on a windless day. The envelope of the balloon contains 1200m3 of hot air of density 0.8kg-3.The mass of material making the balloon without the hot air is 400Kg.The density of the surrounding air surrounding air is 1.3Kgm-3.Determine:

(i)The total weight of the hot air balloon. (3marks)

(ii)The weight of air displaced by the balloon. (3marks)

(iii)The upthrust force on the balloon (1mark)

(iv)The tension in the rope holding the balloon to the ground (2marks)

(v)The acceleration with which the balloon begins to rise when released. (2marks)

19(a)State one reason why the efficiency of a machine is always less than 100 % (1mark)

(b)Figure 12 shows the relationship between the efficiency and the load for a pulley system.

0

100

50

Efficiency %

Load(N)

Figure 12

Explain the shape of the curve (1mark)

(c)Figure 13 shows part of a bicycle

s

16.5cm

Rear sprocket 24 teeth

33cm

Bicycle wheel

Chain

Crank wheel 52 teeth

Figure13

(i)Determine:

I the number of revolutions the rear sprocket for each revolution of the crank wheel .(2marks)

II the velocity ratio of the bicycle . (2marks)

(ii)Determine the efficiency of the bicycle if its mechanical advantage is 0.16 (3marks)