**Name:……………………………………………………………….. Index No. ……………………………..**

**Date: …………………….. Sign……………………**

232/1

PHYSICS

PAPER 1

JULY /AUGUST 2013

TIME: 2 HOURS

**SUBUKIA DISTRICT JOINT EXAMINATIONS**

**Kenya Certificate of Secondary Education 2013**

232/1

PHYSICS

PAPER1

JULY /AUGUST 2013

***Instructions to candidates;***

* Write your name, index number and name of your school in the spaces provided.
* This paper consists of two parts **A** and **B.**
* Answer all questions in sections **A** and **B** in the spaces provided.
* All working **MUST** be shown in the spaces provided after questions.
* Mathematical tables and electronic calculators may be used.

**For examiners use only**

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| --- | --- | --- | --- |
| **Section**  | **Question**  | **Maximum score** | **Candidates score** |
| AB | 1-14 | 25 |  |
| 15 | 11 |  |
| 16 | 13 |  |
| 17 | 11 |  |
| 18 | 10 |  |
| 19 | 10 |  |
|  | **Total score** | **80** |  |

**SECTION A (25 MARKS)**

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

1. The figure below shows a measuring cylinder which contains water initially at a level A. A spherical solid of mass 11g is immersed in the water, the level rises to B.

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 Determine the diameter of the spherical ball (2 marks)

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1. Explain the reason why a dropping dust particle in a still room does not trace a straight vertical path (1 mark)

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1. The figure 2 below shows a beaker containing water placed on a flat bench.

 Fig. 2

 

State and explain the changes in stability of the beaker when the water freezes to ice

 (2 marks)

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1. Figure 3 below shows a solid sphere moving on a platform 5cm above the ground. It rolls down a curved frictionless path in a point 0.5m above the ground.

 

 Calculate its velocity at the lower point (3 marks)

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1. Two table tennis balls hang at the same level suspended from a thread a short distance apart. A stream of air is blown between the balls. Explain what happens to the balls. (2 marks)

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1. Figure 4 shows a bubble of soap blown to the wider end of a funnel.

 

When the top is left open the bubbles flatten to a film which rises up the funnel. Explain observation. (1 mark)

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1. State ***two*** advantages of a force pump over lift pump. (2 marks)

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1. Using the kinetic theory of gases, explain why air inside a tyre exerts pressure on the walls of the tyre. (2 marks)

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1. When ice is heated, the temperature remains constant until all ice is melted. Explain this observation. (1 mark)

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1. A uniform half meter rule is supported by force of 3N and 2N as shown in figure 5 below.



Determine the weight of the half meter rule (2mrks)

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1. A high jumper usually lands on thick soft mattress. Explain how the mattress helps in reducing the force of impact (1 mark)

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1. A particle starts from rest and accelerates uniformly in a straight line. After 3 seconds, it is at a distance of 9m from the starting point. Determine the acceleration of the particle. (3 marks)

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1. A turntable of radius 8 cm is rotating at 30 revolutions per second. Determine the linear speed of a point on the circumference of the turntable. (3 marks)

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**SECTION B (55 MARKS)**

***Answer ALL questions in this section***

14. a) The figure below shows the length of a wooden block being measured.



State two errors made while taking the measurement above. (2marks)

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b) In determining the size of 1molecule of oil a single drop of the oil was dropped from a burette on a tray and it is spread to form a circular patch of diameter 20cm. If 1 molecule of oil is assumed to be 1.67 x 10-8m thick, determine -;

i) The area of the circular patch on the tray. (2 marks)

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ii) The volume of 1 drop of the oil from the burette. (2 marks)

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iii) The radius of the drop from the burette. (2 marks)

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iv) If 10 similar drops from the burette weigh 4.984 x 10-5N, calculate the density of the oil. (2 marks)

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15. a) State two factors that affect the efficiency of a pulley system. (2 marks)

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b) Sketch a labeled diagram to show how arrangement of a single pulley may be used to provide a velocity ratio of 2. (2 marks)

c) The figure below shows a pulley system with the load rising at uniform speed.



From the information given calculate;

i) Velocity ratio of the machine (1 mark)

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ii) Mechanical advantage of the machine. (2 marks)

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iii) Efficiency of the machine. (2 marks)

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d) The handle of the screw- jack in the figure below is 42cm long and the pitch of the screw is 0.5cm.



What force must be applied at the end of the handle when lifting a load of 1188N if the efficiency of the jack is 50%? (4 marks)

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16. a) Define the term ‘heat capacity’ (1 mark)

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b) A block of metal of mass 150g at a 1000C is dropped into a well rugged calorimeter of mass 215g and heat capacity 400JKg-1K-1 containing 100g of water at 250C. The temperature of the resulting mixture is 340C. (Specific heat capacity of water = 4200JKg-1 K-1). Determine;

i) Heat gained by calorimeter. (2 marks)

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ii) Heat gained by water. (2 marks)

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iii) Heat lost by the metal block. (2 marks)

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iv) Specific heat capacity of the metal block. (3 marks)

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c) State two factors that affect the rate of cooling of a liquid. (2 marks)

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17. a) Explain the following observation:-

Ice cubes float on water and solid benzene sinks in liquid benzene. (2 marks)

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b) i) You are provided with the following:-

An overflow can

A beaker

A spring balance

A metal block

Water and

A String

Describe an experiment to verify Archimedes principle. (5 marks)

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ii) A block of wood weighing 2.0N is held under water by a string attached to the bottom of a container. The tension on the string is 0.5N. Determine the density of the wood. (3 marks)

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18. a) Define angular velocity. (1 mark)

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b) A turn table of radius25cm is rotating at a speed of 0.875m/s. Calculate the angular velocity of a point on its circumference. (2 marks)

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c) The figure below shows a graph that was plotted by a student investigating the variation of centripetal force with radius, r of the circular path in which a body rotates.



Given the mass of the body is a 100g, use the graph to determine the angular velocity, w of the body. (4 marks)

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d) The graph below shows a displacement time graph of the motion of a body.



State the nature of the motion between;

i) A and B (1 mark)

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ii) B and C (1 mark)

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iii) C and D (1 mark)

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