NAME_____INDEX NO _____

CANDIDATE'S SIGNATURE_____

DATE_____

232/1
PHYSICS
PAPER 1 (THEORY)
JULY/AUGUST 2014
2 HOURS

MBOONI EAST SUB - COUNTY FORM FOUR JOINT EXAMINATION 2014

Kenya Certificate of Secondary Education

PHYSICS
PAPER 1 (THEORY)
2 HOURS

INSTRUCTIONS

- Write your name and Index number in the space provided
- Sign and write the date of the examination in the space provided above
- This paper consists of two sections A and B.
- Answer all the questions in the spaces provided.
- All workings must be clearly shown.
- Mathematical tables and silent electronic calculators may be used.
- This paper consists of 9 printed pages. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

For examiner's use only

SECTION	QUESTION	TOTAL MARKS	CANDIDATE'S SCORE
A	1-10	25	
B	11	10	
	12	13	
	13	12	
	14	10	
		80	

TOTAL CANDIDATE'S SCORE

Section A [   ] + section B [   ] = [   ]
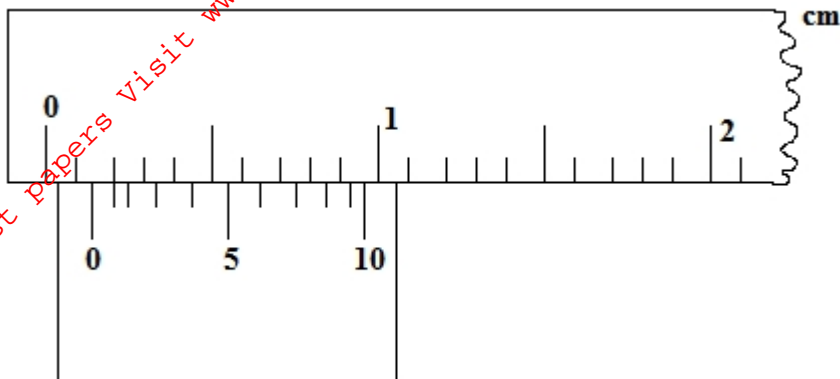
2014 Mbooni East Sub - County Form Four Joint Examination
232/1
Physics
Paper 1

SECTION A (25 MARKS)

Answer ALL questions in this section in the spaces provided after each question

1. The figure 1, below shows parts of a vernier calliper when the jaws are closed without an object between the jaws.
   Fig. 1

   (a) Calculate the zero error of the vernier callipers.   (1 Mark)
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   (b) A student used the vernier callipers shown in Fig. 1 to measure the diameter of a test tube whose actual diameter was 2.13cm. Determine the reading of the vernier callipers.   (2 Marks)
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2. Explain why ethylated spirit at room temperature when dropped at the back of the palm makes the palm to feel very cold.   (2 Marks)
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3. A block measuring 20cm by 10cm by 4 cm rests on a flat surface. The block has a weight of 6.0N. Determine:
   (a) The minimum pressure it exerts on the surface.   (2 Marks)
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   (b) The density of the block in kg/m^3.   (2 Marks)
       Take (g = 1N/kg)
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4. (a) State the kinetic theory of matter. (1 Mark)

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(b) Why is smoke preferred for use in the smoke cell experiment?

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5. In the figure 2 below shows a uniform bar of length 1.0M pivoted near one end. The bar is kept in equilibrium by a spring balance shown.

Figure 2
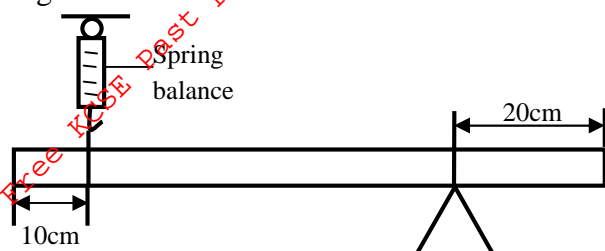
Given that the weight of the metre bar is 1.4N, determine the reading of the spring balance. (3 Marks)

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6. A turntable of radius 10cm is rotating at 43 revolutions per second. Determine the linear speed of a point on the circumference of the turntable. (3 Marks)
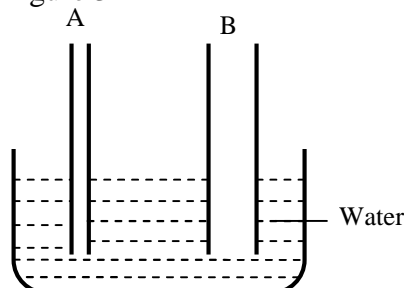
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7. The figure 3 below shows two capillary tubes of different sizes dipped in water.

Figure 3

(a) Mark on the diagram the level of water in the capillary tubes. (1 Mark)

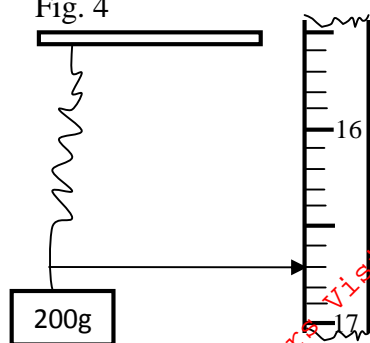(b) Explain the difference in the level of water in the two tubes. (1 Mark)

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8. Figure 4 shows a spring on which a mass of 200g is suspended at its lower end.
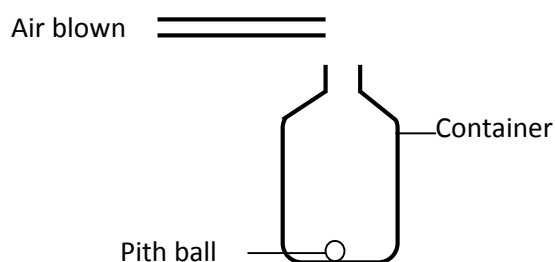   Fig. 4

   If the pointer was at 102cm mark mon the scale, without the mass, determine the spring constant for the spring. (Give your answer to the nearest 4 significant figures) (3 Marks)

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9. The figure below shows a pith ball in a container.
   Figure 5

   State and explain what would happen if air is blown over the mouth of the container (2 Marks)

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10. On the axes below, sketch a graph to show how the pressure of a friend mass of a gas varies with nature at a constant temperature. (1 Mark)
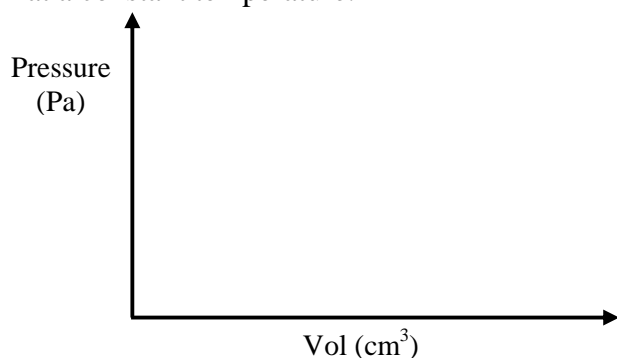
SECTION B (55 MARKS)
ANSWER ALL QUESTIONS

11. (a) The figure 7 below shows the starting of motion of two arrows 10M above the ground. Both arrows were shot with initial velocity of 20m/s, from one point and at the same instant.
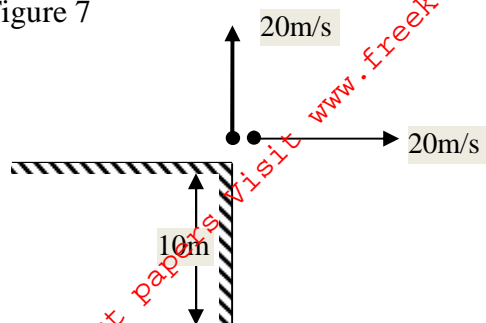   Figure 7

(i) Determine the total height reached by the arrow shot vertically   (3 Marks)

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(ii) Calculate the time of flight taken by the arrow shot horizontally as it strikes the ground.   (2 Marks)

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(iii) Calculate the horizontal distance covered by the arrow shot horizontally as it strikes the ground
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12. (a) (i) State 2nd Newtons law of motion.   (1 Mark)

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(ii) Explain why a high jumper flexes his knees when landing on the ground   (1 Mark)

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(b) A ball of mass 100g is dropped from a height of 1.25m above the ground surface. It rebounds to a height of 1.1m.

Calculate

(i) Velocity of ball before impact (2 Marks)

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(ii) Force of impact (Take g =10N/kg) (3 Marks)

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(d) (i) Distinguish between elastic and inelastic collission (1 Mark)

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(ii) A car of mass 800kg collides heads with a truck of mass 5000kg travelling at 40m/s. The car is thrown on to bonet of the truck which continous to move after impact at 10m/s in the original direction. How fast was the car moving (3 Marks)

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13. (a) Define a machine (1 Mark)

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(b) The figure 8 below shows a pulley a pulley system for lifting heavy objects.

Figure 8
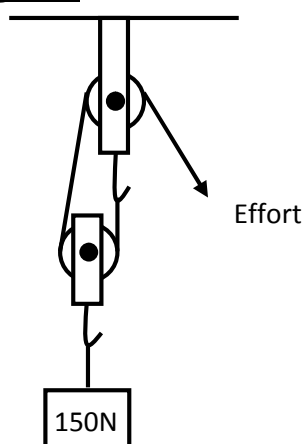
(i) State the velocity ratio of the pulley system. (1 Mark)

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(ii) If the efficiency of the machine is 75%, calculate the mechanical advantage of the system. (3 Marks)

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(iii) Determine the effort applied (3 Marks)

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(c) A stone of mass 4kg is thrown upwards with a kinetic energy of 240J. Neglecting air resistance, calculate the height to which it will rise. (Take g = 10N/kg) (3 Marks)

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14. (a) Explain why water kept in a porous pot on a hot day remains cooler than that contained in a metallic vessel. (1 Mark)

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(b) (i) An immersion heater takes 30 minutes to heat 20kg of water from 25^0C to 60^0C. How long would the same heater take to heat the same mass of kerosene through the same temperature range assuming no hear is lost to the surrounding? (4 Marks)

Specific heat capacity of water = 4200JKg-1k-1
Specific heat capacity of kerosene = 2200 JK-1K-1)

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(ii) How long would the same heater take to vapourise the whole amount of water?
(Specific latent heat of vaporisation of water = 2.26×10^6JKg^{-1}) (4 marks)

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(c) State two factors that affect the boiling point of water and in each case explain how it is affected
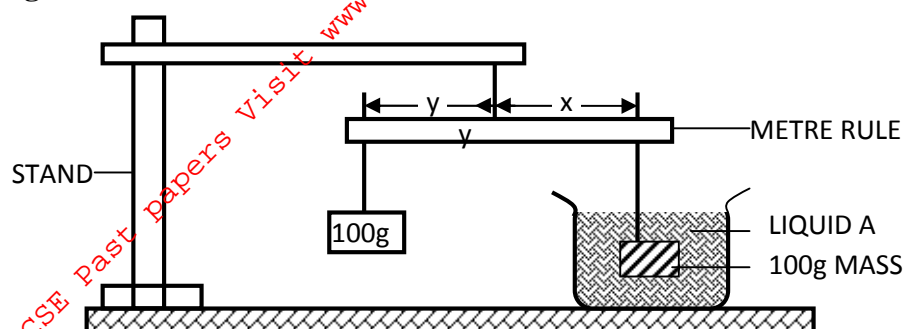(3 Marks)

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15. (a) Define the relative density of a solid   (1   Mark)

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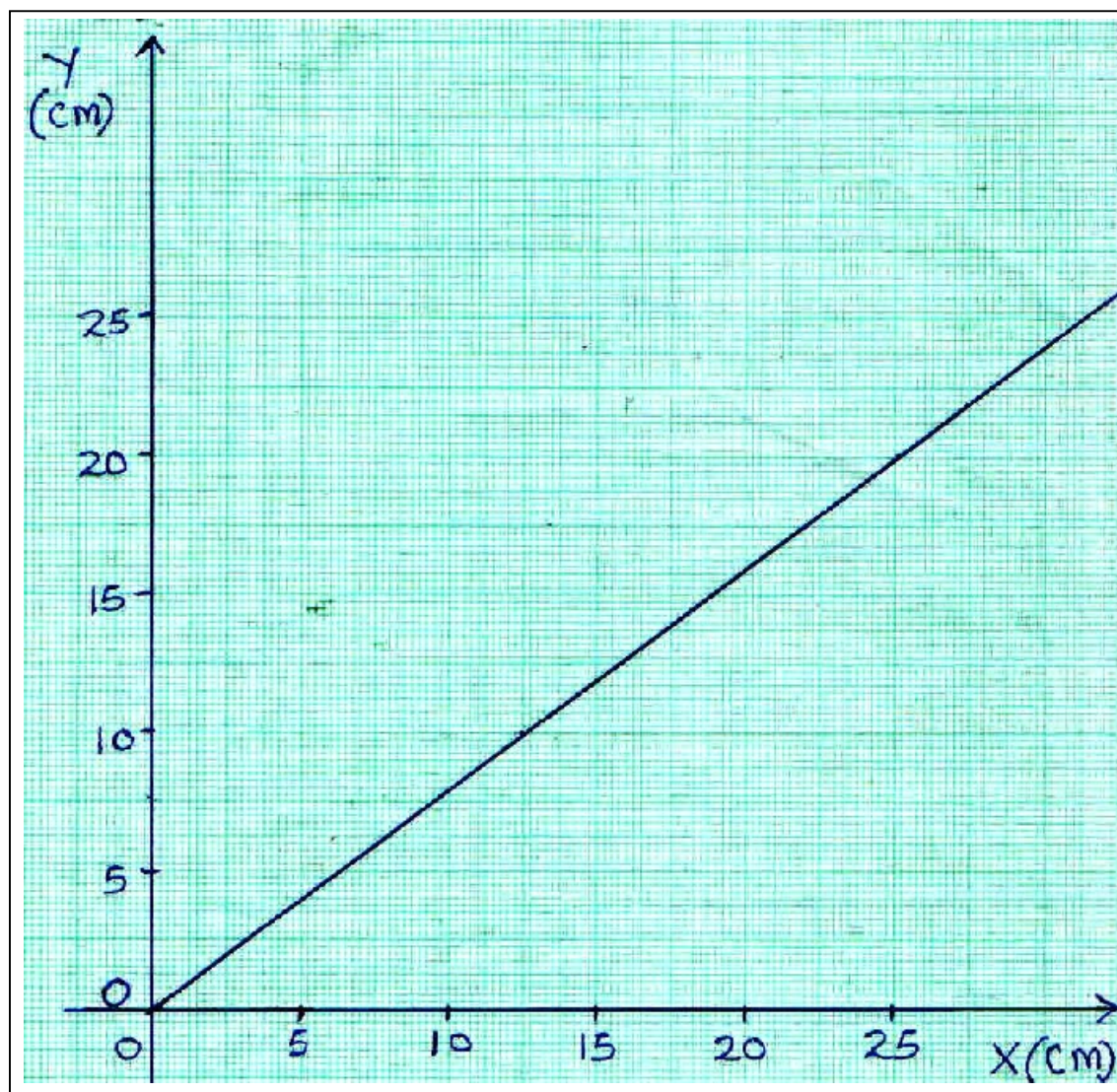
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(b) In an experiment to determine the relative density of liquid A, the following set up was used.

Figure 9

The distance x of the mass in liquid A was measured for various length, y of an identical mass of equilibrium and a graph of y against x was drawn as shown in the grid below.

GRAPH OF Y AGAINST X

(i) Determine the gradient, S, of the graph. (3 Marks)

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(ii) If $S = \frac{F}{W}$, where F is the apparent weight of mass in liquid A and W is the actual weight of the mass. Calculate the value of F and the apthrust u.

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(iii) Determine the relative density of the liquid a, Given that the weight of the 100g mass in water was 0.9N.

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(c) A balloon's fabric weighs 10N and has a gas capacity of $2M^3$. If the gas in the balloon weighs 2N and air has density 1.29kg/m3, Find the resultant force on the balloon when it is floating in air.

(4 marks)

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