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# IKUTHA SUB-COUNTY KCSE REVISION MOCK EXAMS 2015

## PHYSICS PAPER 1

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GATUNDU SOUTH SUB-COUNTY FORM FOUR 2015 EVALUATION EXAM

NAME \_\_\_\_\_ INDEX NO. \_\_\_\_\_  
SCHOOL \_\_\_\_\_ SIGNATURE \_\_\_\_\_  
DATE \_\_\_\_\_

232/1

PHYSICS

PAPER 1

JULY/AUGUST, 2015

TIME: 2 HOURS

**IKUTHA SUB-COUNTY FORM FOUR JOINT EXAMINATION, 2015**

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

232/1

PHYSICS

PAPER 1

(THEORY)

TIME: 2 HOURS

**INSTRUCTIONS TO CANDIDATES**

- Write your name, school and index number in the spaces provided above.
- Sign and write the date of the examination in the spaces provided above.
- This paper consists of two sections, Section **A** and **B**.
- Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- **ALL** answers and working **MUST** be clearly shown.
- Mathematical tables and non-programmable silent electronic calculators may be used.
- Take acceleration due to gravity,  $g = 10\text{ms}^{-2}$

**FOR EXAMINER'S USE ONLY**

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Section	Question	Maximum score	Candidate's score
A	1–14	25	
B	15	13	
	16	10	
	17	13	
	18	12	
	19	07	
	TOTAL	80	

*This paper consists of 12 printed pages*

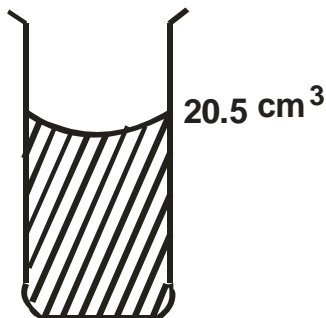
*Candidates should check to ensure that all pages are printed as indicated and no questions are missing*

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**SECTION A** (25 MARKS)

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

1. The figure 1 below shows a measuring cylinder with a fluid to the level shown.



*Figure 1*

Find the new level when a solid of mass 13.6g and a density  $1250\text{kgm}^{-3}$  is fully immersed into the cylinder.

(2 marks)

2. State **two** factors that affect surface tension.

(2 marks)

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3. Explain why the handle of a door is usually placed as far as possible from the hinges.

(1 mark)

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4. A tin with a hole is filled with water to a certain height. Water jets out as shown in figure 2(a) below. A second identical tin is filled with water to the same height and a block of wood floated as shown in figure 2(b).

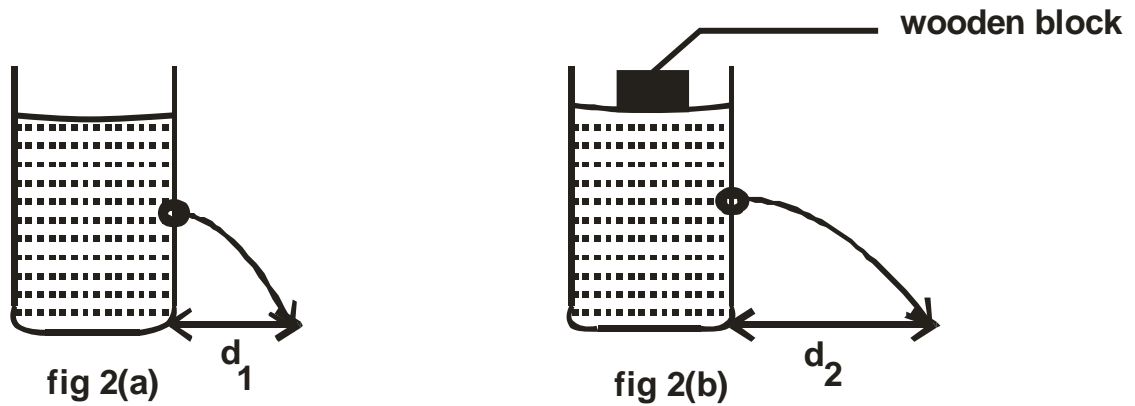


Figure 2

State the reason why the maximum distance of jet  $d_2$  is greater than  $d_1$ . (1 mark)

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5. Sketch a displacement time – graph for a body which is uniformly accelerated. (2 marks)

6. A horse rider bends forward when the horse is on high speed. State a reason for this observation. (1 mark)

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7. Figure 3 below shows energy transformation chain of a lighting system of a bicycle.

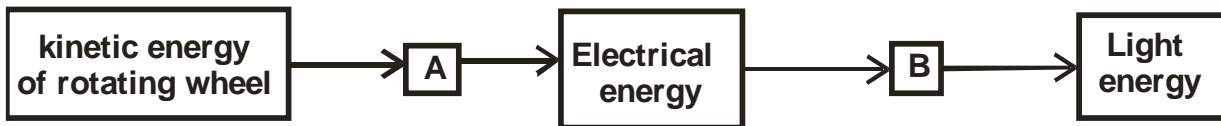


Figure 3

Name the transducers A and B.

A \_\_\_\_\_ (1 mark)

B \_\_\_\_\_ (1 mark)

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8. Figure 4 below shows a uniform metre rule of mass 300g pivoted at the 0 mark and kept balanced horizontally by a string fixed at 55cm mark.

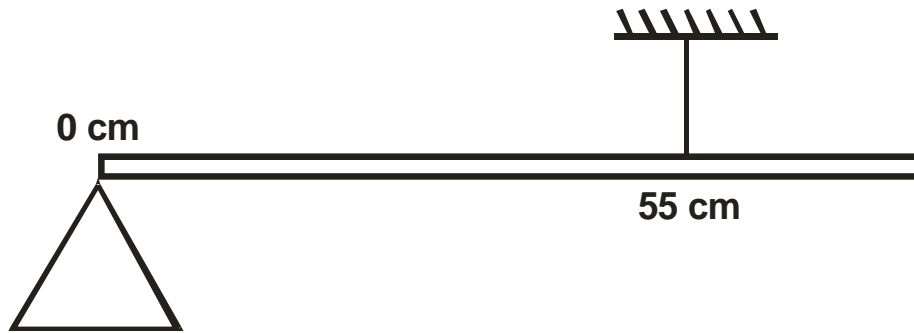


Figure 4

Determine the tension in the string.

(3 marks)

9. The figure 5 shows identical wooden splinters burning. One is placed on wood and the other on metal block. When the flame reached the edge of the metal block, the splinter went off but the one on wood continued burning. Explain. (2 marks)

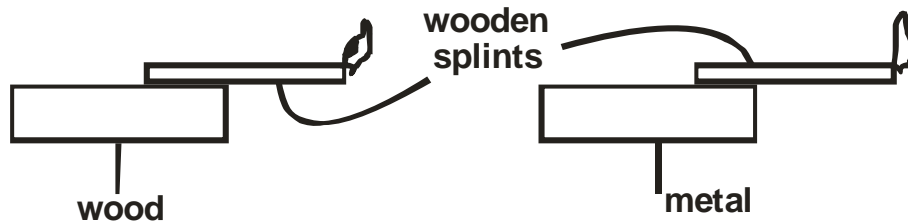


Figure 5

10. State the difference between evaporation and boiling. (2 marks)

11. Three springs shown below are identical and of negligible weight. The extension produced on the system is 20cm.

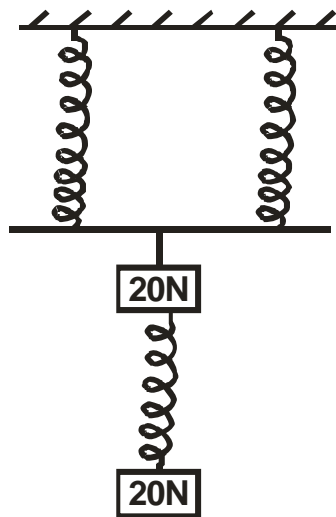


Figure 6

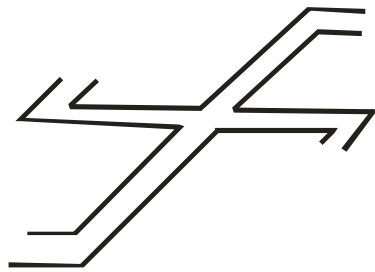
- Determine the constant of each spring. (3 marks)

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12. State **two** factors that affect the critical velocity of a vehicle negotiating a bend. (2 marks)

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13. Figure 7 represents a garden sprinkler.



*Figure 7*

On the same figure indicate the direction of rotation of the sprinkler when water is ejected through the nozzles at a high velocity. (1 mark)

14. State the principle of conservation of energy. (1 mark)

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**SECTION B** (55 MARKS)

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

15. a) A boy throws a tennis ball vertically upwards from a truck moving at a constant velocity.

Give the reason why the ball lands back exactly the same point where it was projected. (1 mark)

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b) Define impulse in terms of momentum.

(1 mark)

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c) A trailer of mass 30 tonnes travelling at a velocity of 72km/h runs onto a stationary bus of mass 10 tonnes. The impact takes 0.5seconds before the two vehicles move off together at a constant velocity for 15 seconds. Determine,

i) The common velocity.

(3 marks)

ii) The distance moved after the impact.

(2 marks)

iii) The impulsive force on the trailer on impact.

(3 marks)

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d) Give a reason why when a passenger jumps from a floating boat, the boat moves backwards. (1 mark)

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e) Give the reason why a safety seat belt used in a vehicle:

i) Should have a wide surface area. (1 mark)

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ii) Should be slightly extensible. (1 mark)

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16. a) State **two** ways through which the rate of evaporation of a liquid may be increased. (2 marks)

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b) A metal of 10kg is heated to  $120^{\circ}\text{C}$  and then dropped into 2kg of water. The final temperature of the mixture is found to be  $50^{\circ}\text{C}$ . Calculate the initial temperature of the water

(Specific heat capacity of metal =  $450\text{Jkg}^{-1}\text{K}^{-1}$  and specific heat capacity of water =  $4200\text{Jkg}^{-1}\text{K}^{-1}$ )

(3 marks)

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c) Give the property of water which makes it suitable for use as a coolant in machines. (1 mark)

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d) Formation of ice on roads during winter in cold countries is known to hamper vehicles.  
State **two** ways in which the melting point of ice may be lowered to solve this problem. (2 marks)

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- e) Some ether is put in a combustion tube and two glass tubes inserted into the tube through a cork as shown in the figure 8. The combustion tube is then put into a smaller beaker containing some water and a thermometer dipped in the water. When air is blown into the ether as shown, the reading in the thermometer lowers. Explain this observation. (2 marks)

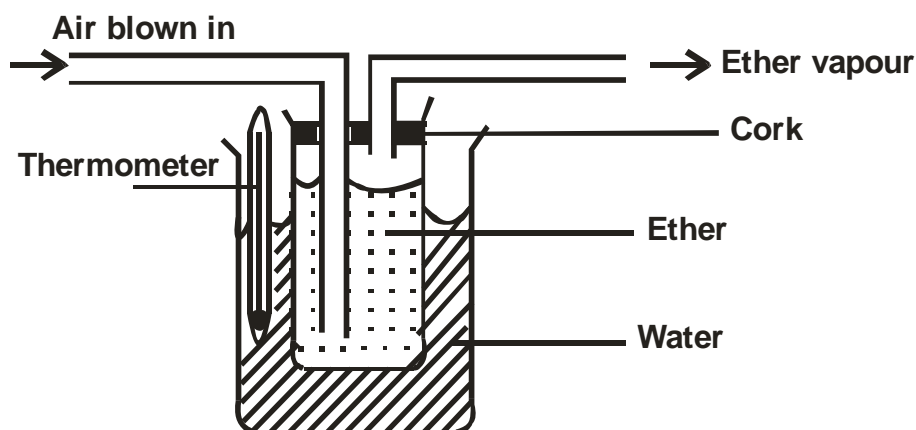


Figure 8

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17. a) Figure 9 below shows a machine being used to raise a load. Use the information given in the figure to answer questions below.

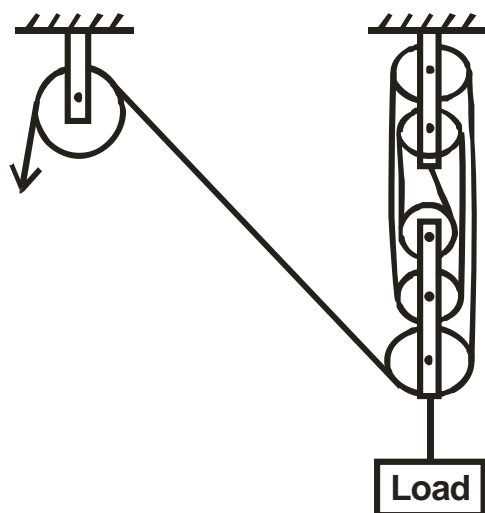


Figure 9

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i) Determine the velocity ratio of the machine.

(1 mark)

ii) If a load of 800N is raised by applying an effort of 272N, determine the efficiency of the machine

(3 marks)

b) A crane lifts a load of 2000kg through a vertical distance of 3.0m in six seconds. Determine:

i) The work done.

(2 marks)

ii) The power of the crane.

(2 marks)

c) State **two** reasons why the efficiency of a machine is not 100%.

(2 marks)

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d) A block of a metal having a mass of 40kg requires a horizontal force of 100N to drag it with uniform velocity along a horizontal surface. Determine its coefficient of friction. (3marks)

18. Figure 10 below shows the same block weighed in air, water and liquid. Given that the reading of the level of water becomes  $150\text{cm}^3$  when the metal is fully immersed.

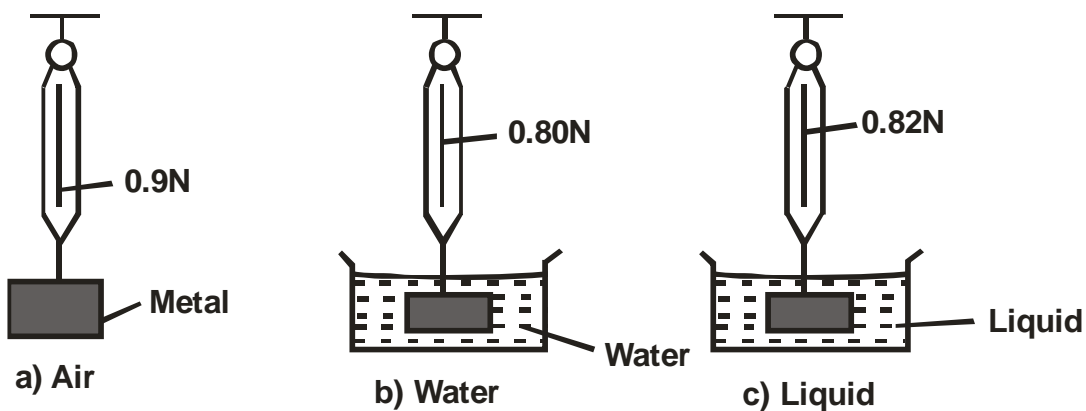


Figure 10

a) Determine:

i) The density of the metal.

(3 marks)

ii) Water level before the solid was immersed.

(3 marks)

iii) The density of the liquid L.

(3 marks)

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- b) A certain mass of hydrogen gas occupies a volume of  $2.6\text{m}^3$  at a pressure  $1.5 \times 10^5$  pa and temperature of  $12^\circ\text{C}$ . Determine its volume at a temperature  $0^\circ\text{C}$  and pressure of  $1.0 \times 10^5$  pa. (3 marks)

19. a) A bullet is fired horizontally at a velocity of  $400\text{ms}^{-1}$  from a cliff which is  $50\text{m}$  tall as shown in figure 11 below.

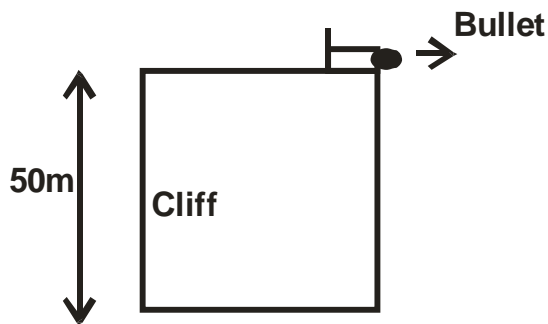


Figure 11

- i) On the diagram draw the trajectory of the bullet until it comes to rest. (1 mark)
- ii) Find the time taken for the bullet to hit the ground. (2 marks)
- iii) Find the range of the bullet. (1 mark)



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b) i) An electron of mass  $9.1 \times 10^{-31}$  kg is spinning around an atom of radius  $6.2 \times 10^{-11}$  m at a speed of  $3.0 \times 10^8 \text{ ms}^{-1}$ . Determine the force acting on the electron. (2 marks)

ii) If the electrostatic force on the electron was suddenly removed, how will the electron move? (1 mark)

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