

NAME: ----- INDEX NO: -----

SCHOOL: ----- TIME: -----

232/1

PHYSICS

PAPER 1

JULY/AUGUST 2013

TIME: 2 HRS

**LARI SECONDARY SCHOOLS JOINT- DISTRICT MOCK
KENYA CERTIFICATE OF SECONDARY EDUCATION
PHYSICS PAPER 1**

INSTRUCTION TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided.
- Answer all the questions in section A and B in spaces provided.
- All working MUST be clearly shown.
- Mathematical tables and electronic calculators may be used.

. Take $g = 10\text{m/s}^2$ and density of water = 1000kg/m^3 , $L_v = 2.6 \times 10^6\text{Jkg}^{-1}$, $L_f = 3.3 \times 10^5\text{J}^{-1}$

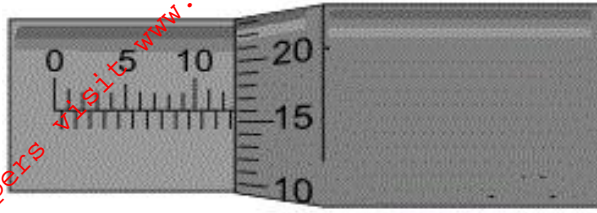
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SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 -11	25	
B	12	13	
	13	12	
	14	13	
	15	17	
TOTAL SCORE		80	

This paper consists of 11 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A (25 MARKS)

1. The diagram below shows a section of a micrometer screw gauge.



The micrometer screw gauge is used to measure the diameter of a marble. What is the diameter of the marble if micrometer screw gauge has an error of -0.02 (2 marks)

2. A student heated an equal amount of water in aluminum containers, by a flame of equal hotness. If, one of the container was bigger than the other, which will take longer time to boil water and why?

(2marks)

3. A gas flows at a speed of 5m/s through a pipe of cross-sectional area of 3.6m^2 . Determine the speed of the gas in a pipe of area 1.8m^2 . (2marks)

4. Two pieces of cotton wool were soaked, one with ammonia solution and the other with concentrated hydrochloric acid. They were placed at the end of glass tube as shown below.



In the same test tube indicate with an arrow where the white deposit will be formed if the temperature of end B is lowered and that of end A maintained as before. Give reason of why the white fumes is formed at that point you have indicated. (2marks)

5. 0.2kg of copper at 80°C is put in a well-lagged brass calorimeter of mass 0.1kg containing 0.16kg of sea water at 20°C . Calculate the final steady temperature of the mixture. ($c_{\text{copper}}=400\text{Jkg}^{-1}\text{K}^{-1}$; $c_{\text{brass}}=380\text{Jkg}^{-1}\text{K}^{-1}$; $c_{\text{seawater}}=3900\text{Jkg}^{-1}\text{K}^{-1}$) (3marks)

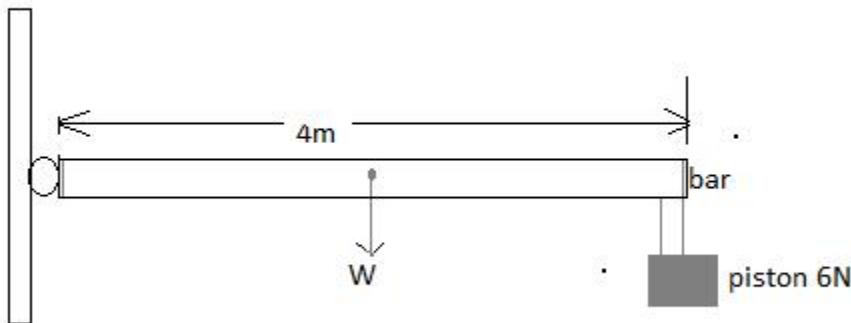
6. If an umbrella is touched with finger on inner surface when it is raining, it allows the rain water to leak through. Give reason (1mark)

7. A spring balance is used by Natalia to pull a toy car M through a distance of 1.6m at an angle of 30° as shown below.



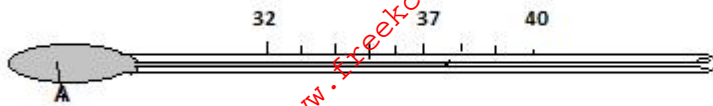
The reading of the spring balance is 12.9N. The spring balance has a positive zero error of 0.5N. Assuming that the surface is smooth, find the work done by Natalia. (3marks)

8. A piston supports a uniform bar by applying a force of 6.0N as shown below so that it balances horizontally.



Determine the weight W of the bar. (2marks)

9. The figure below shows a thermometer used by a doctor to determine the temperature of a patient. Why is it difficult to work with this thermometer? (2marks)



10. A machine consists of a wheel of radius 40cm and axle of radius 10cm. Determine the efficiency of the machine when used to lift a load of 300N using an effort of 100N. (3marks)

11. A certain mass of hydrogen gas occupies a volume of 1.6m^3 at a pressure of $1.5 \times 10^5\text{Pa}$ and a temperature of 12°C . Determine the volume when the temperature is 0°C at a pressure of $1.0 \times 10^3\text{Pa}$. (3marks)

SECTION B (55 MARKS)

12. The table below shows values obtained of compression of a spring as the load was applied on the top of the spring.

Load (N)	0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	19.0	22
Compression (cm)	12.2	11.1	10.0	8.9	7.8	6.7	5.6	5.2	5.2	5.2

a) Plot the graph of the compression of a spring against load(x axis) applied. (5marks)



- b) Calculate the energy stored on the spring when the load of 10N was applied on the spring. (2marks)

- c) Use the graph to calculate the spring constant (3marks)

- d) Suggest a reason for the shape of the graph between 17.5N to 22N 2marks

13(a).A lawn tennis ball is thrown such that it hits a wall perpendicularly at a speed of 6.5m/s as shown in the figure below.

lawn tennis ball.



The ball has a mass of 50g and it is in contact with the wall for 0.02s.

(i) What is meant by impulse? (1mark)

(ii) Find how much force is applied to the wall by the ball (3marks)

(iii) How much deceleration does the ball experience? (2marks)

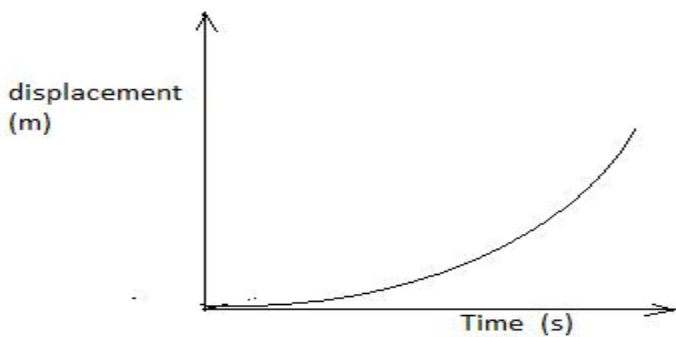
(iv). Determine the change in momentum of the ball. (2marks)

(v) Giving your reasons state the type of collision that the ball undergoes. (2marks)

(b) Basing your argument on Newton's second law, explain why the athletes for high jump land on a thick soft mattress and not on a hard ground. (2marks)

14. (a) what do we mean by acceleration? (1mark)

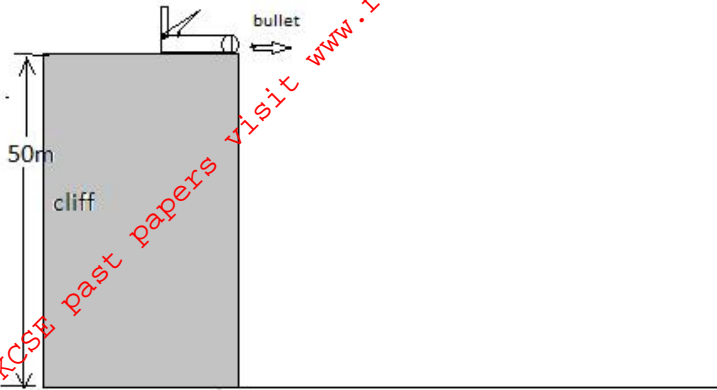
(b) Below is a displacement-time graph for a rally vehicle.



(i) Describe the way the vehicle is moving. (2marks)

(ii) Draw a velocity-time graph for this vehicle. (2marks)

(c) A bullet is fired horizontally at a velocity of 400m/s from a cliff which is 50m tall as shown below.

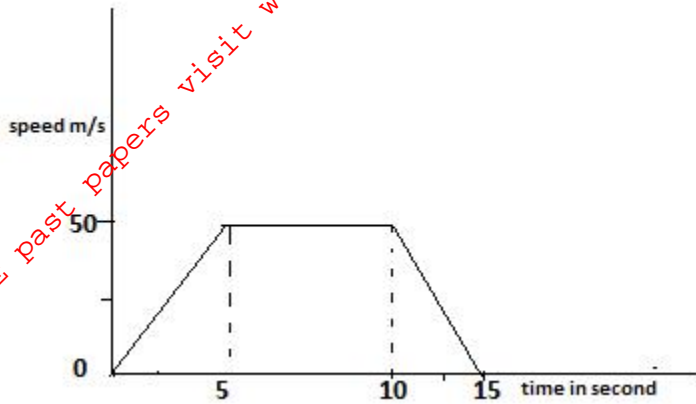


(i) On the diagram draw the trajectory of the bullet until it comes to rest. (1mark)

(ii) Find the time taken for the bullet to hit the ground. (2marks)

(iii) Find the range. (2marks)

(d) Below is a velocity-time graph of a public service vehicle.



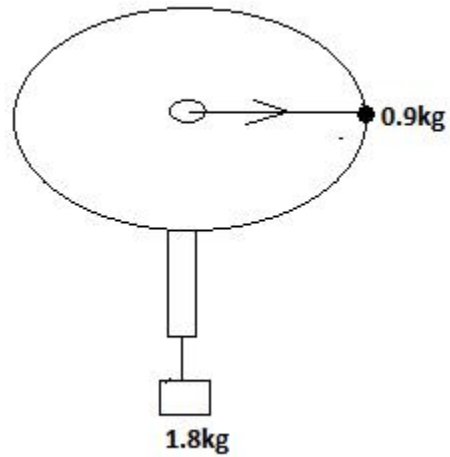
Determine the distance covered. (3marks)

15(a) A small ball of mass 30g is spinning on a string of length 80cm in a horizontal circle.

(i) Which type of force produces the centripetal force? (1mark)

(ii) Explain why the speed of the ball is constant but the velocity is not. (1mark)

(b) Two masses of 0.9kg and 1.8kg are attached on an inelastic string as shown below.

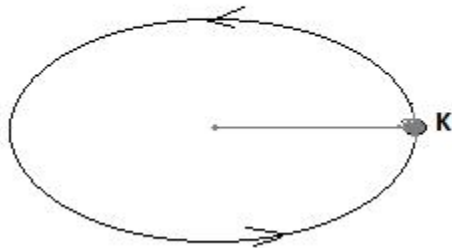


The radius of the circle through which the 0.9kg mass spins is 0.5m. Find the:

(i) Tensional force that will keep the system in circular motion. (2marks)

(iii) Angular velocity at which the 0.9kg mass must spin in order that the 1.8kg mass does not slide downwards. (3marks)

(c) An object k is at the edge of a turntable as shown below.



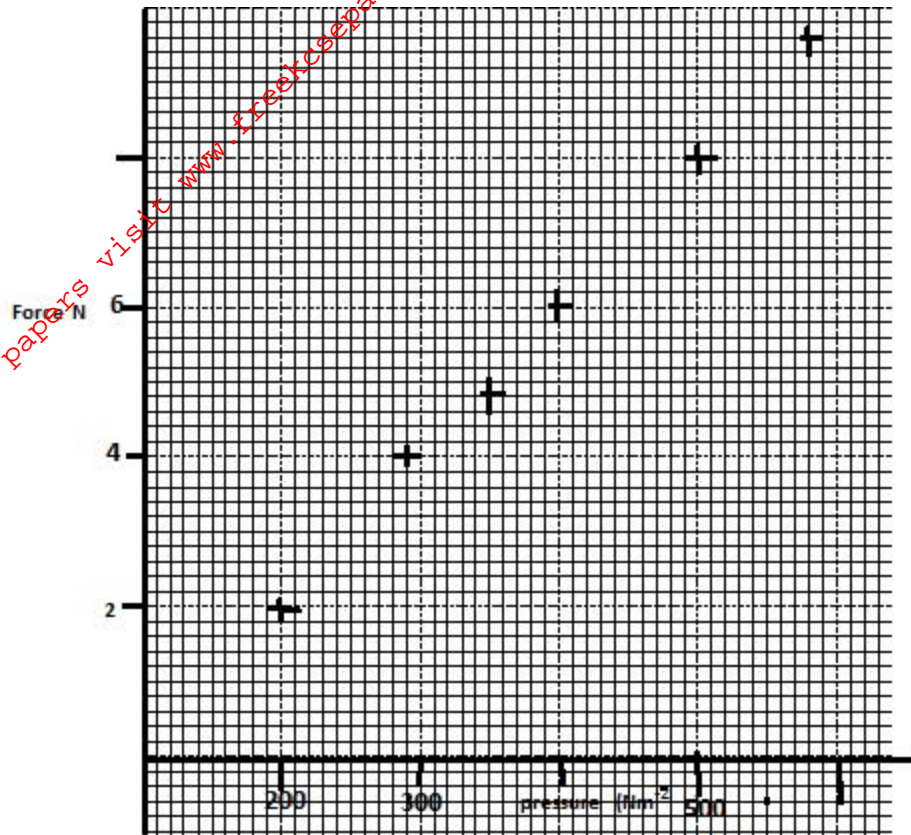
d. The table spins anticlockwise. What factors will affect the force acting on the object? (2marks)

e. An electron of mass 9.1×10^{-31} kg is spinning around an atom of radius 6.2×10^{-11} m at a speed of 3.0×10^8 m/s.

(i) Determine the force acting on the electron. (2marks)

ii) If the electrostatic force on the electron was suddenly removed, how will the electron move? (4 mark)

f. The graph below shows the variation of pressure produced at the end of piston as the force is applied on its.



- a) Draw the line of the best fit (1mark)
- b) From the graph determine the area of the piston. (3marks)
- c) On the same graph draw a line showing the pressure produced when the same force was applied on a wider piston. (1mark)