NAME:..... INDEX NO:.....

SCHOOL:..... CANDIDATE'S SIGN:.....

DATE:.....

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

MERU COUNTY JOINT EVALUATION EXAM - 2014

Kenya Certificate of Secondary Examination K.C.S.E

232/1
PHYSICS
PAPER 1
(THEORY)
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INSTRUCTIONS TO CANDIDATES

a) This paper consists of two sections A and B.
b) Answer ALL the questions in the two sections in the spaces provided.
c) All the working must be clearly show.
d) Non programmable silent electronic calculator and KNEC Mathematical tables may be used.

FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12		
B	13		
	14		
	15		
	16		
	17		
TOTAL		80	

This paper consists of 12 printed pages.
Candidates must check to ascertain that all pages are printed as indicated and that no question(s) is/are missing.

SECTION A (25 MARKS)

Answer all the questions in this section in the spaces provided.

Figure 1 below shows a section of a micrometer screw gauge with an error of negative 0.02mm. is used to measure the diameter of a marble.

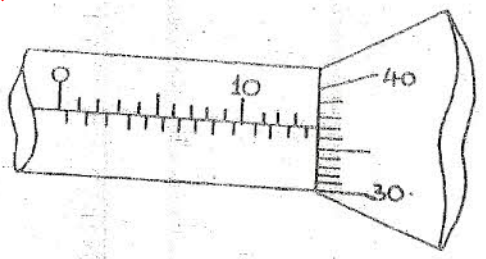

Fig 1

Determine the actual diameter of the marble. (2mks)

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It is easier to wash clothes with hot water than with cold water. Explain. (2mks)

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The mass of an empty density bottle of volume $40cm^3$ is 25g. Lead shots are poured into the density bottle and the total mass is 52g. Water is then added into the bottle with lead shots until the bottle is full. If the total mass of the bottle and its contents is 72g, calculate the density of the lead shots. (Density of water is $1000kgm^{-3}$) (3mks)

4. A student tried to suck soda using a straw with a hole on its side as shown in figure 2 below.

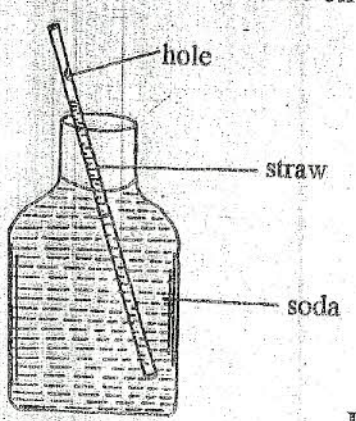

Fig 2.

She found out that the Soda did not go up to her mouth. Explain (2mks)

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5. Other than temperature state two factors that affect the rate of diffusion of a gas. (2mks)

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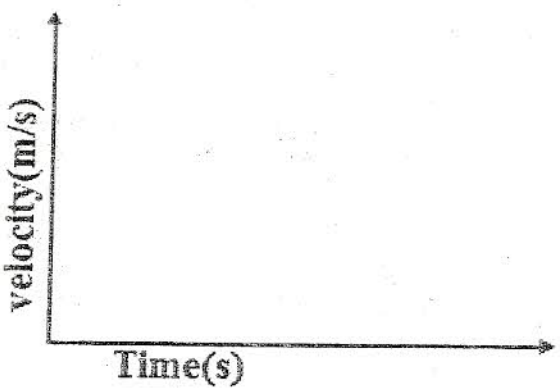
6. On the axes in figure 3 below, sketch a velocity – time graph for a small lead shot falling through a viscous liquid. (1mk)



7. A stone of mass 2kg is moving uniformly in a vertical plane of radius 1m as shown in figure 4 below.

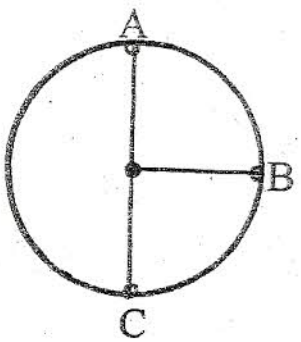


Fig 4.

If it is whirled at a speed of 12.57m/s

(a) Calculate the tension in the string when the stone is at point A. (2mks)

(b) If the speed is increased, at what point is the string likely to snap (break)? (1mk)

Some air is blown into a test tube containing ether as shown in figure 5 below.

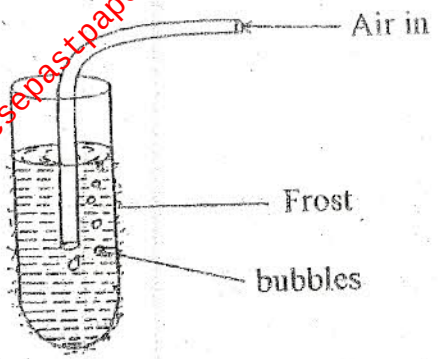


Fig. 5

Explain why frost forms on the outside surface of the test tube. (2mks)

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9. The sketch shown in figure 6 below shows the displacement-time graph of a particle.

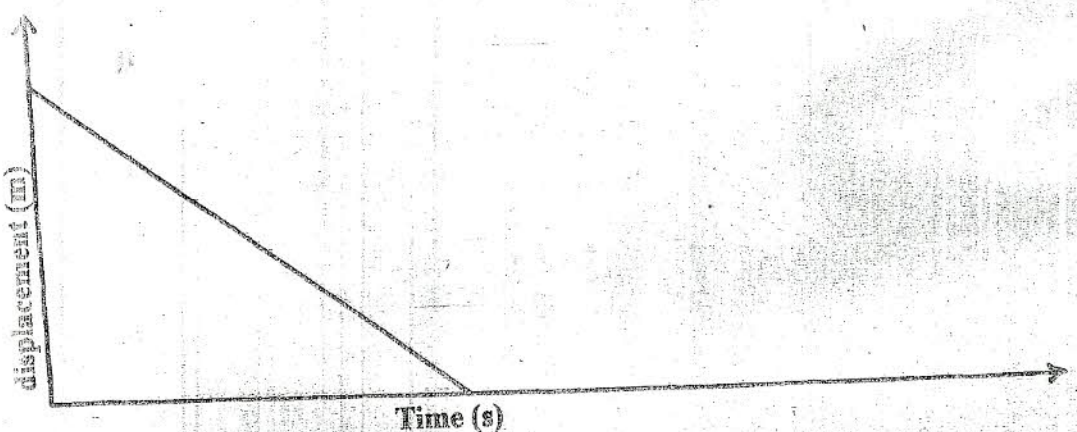

Fig. 6

Describe the motion of the particle. (1n

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10. A bathroom shower has 100 holes each 5.0mm^2 in area. Water flows from a pipe of cross sectional area 5.0cm^2 at 10m/s. Determine the speed of the spray. (3

11. A body is pushed up an inclined plane as shown in figure 7 below.

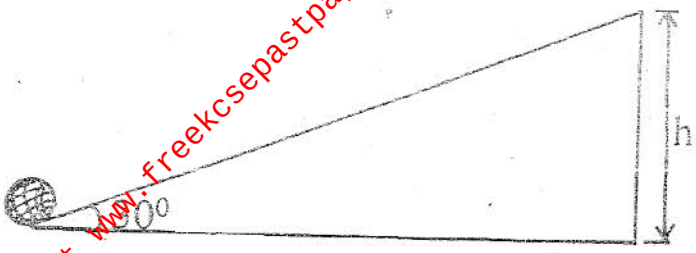
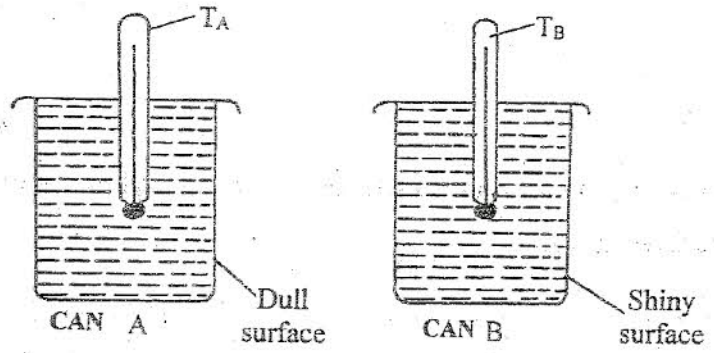


Fig. 7

Determine the velocity ratio of the system. (2mks)

12. Two similar cans A and B are filled with hot water. The outer surface of can A is dull while that of can B is shiny.



State with reason which can will be at a lower temperature after some time. (2mks)

SECTION B (55 Marks)

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

(a) Distinguish between speed and velocity. (2mks)

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(b) A car is brought to rest from an initial velocity of 30m/s in 3 seconds. Calculate the average retardation. (3mks)

(c) Figure 9 below shows a section of a tape of a ticker timer attached to a moving trolley. The frequency of the timer is 50Hz.

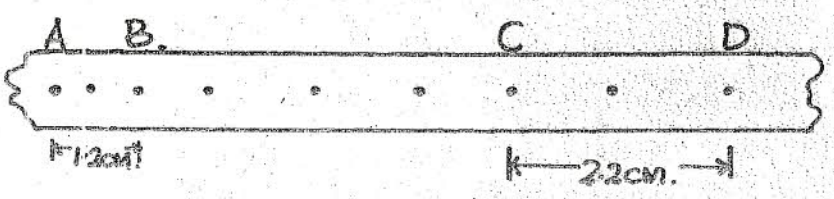

Fig. 9

Determine:

(i) The average velocity at intervals between AB and CD. (2mks)

(ii) The acceleration of the trolley. (2mks)

(d) Figure 10 below shows a block of wood of mass 5kg placed on the edge of a table. If the block is in equilibrium, determine the minimum force that can make the block to topple

(3mks)

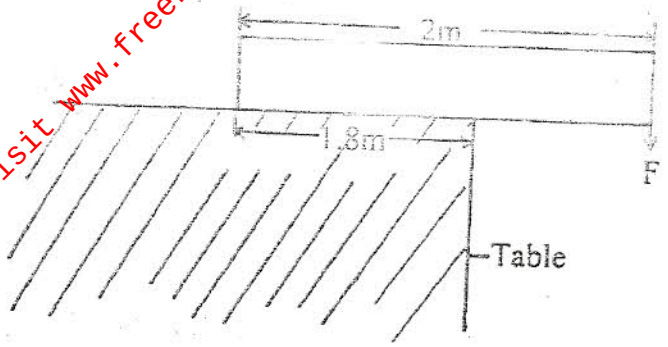

Fig 10.

14. (a) State Hooke's law

(1mk)

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(b) The graph in figure 11 below is a graph of force against extension for two identical springs arranged in parallel.

A GRAPH OF FORCE AGAINST EXTENSION

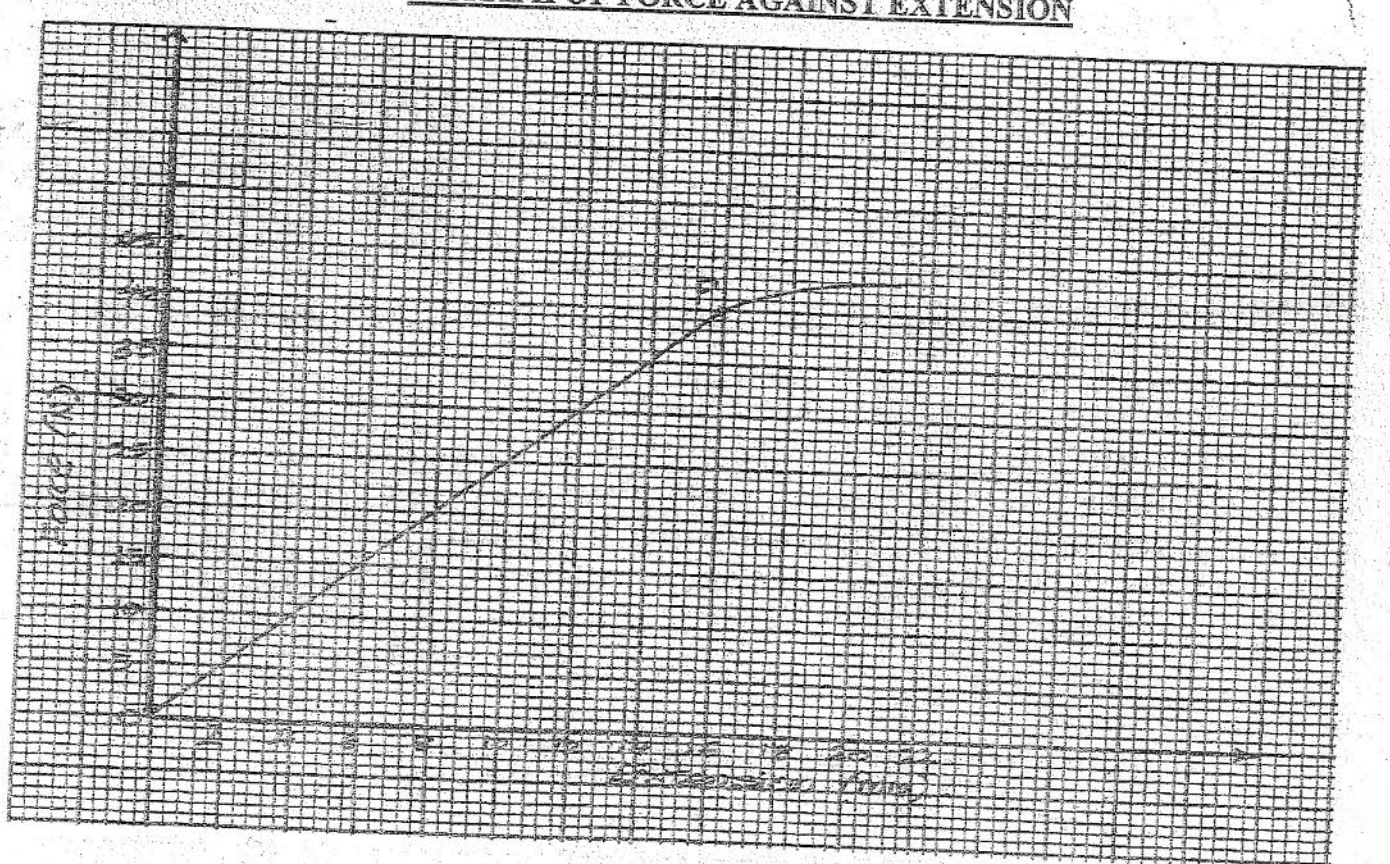

Fig. 11

(i) Use the graph to determine the spring constant for a single spring. (3mks)

(ii) The work done in stretching the two springs between points O and P. (3mks)

(c) A pendulum bob is displaced sideways as shown in figure 12 below.

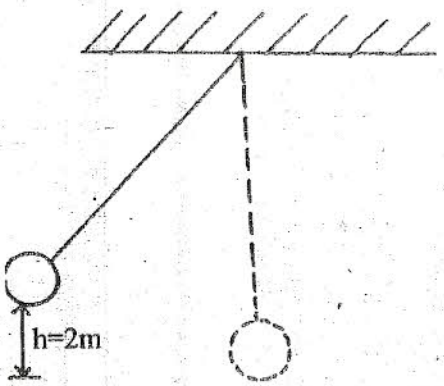

Fig. 12

Given that the mass of the pendulum bob is 0.1kg, determine its velocity at the lowest position. (Take g = 10N/kg) (3mks)

15. (a) Distinguish between specific heat capacity and heat capacity. (2mks)

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(b) A metal ball of mass 0.02kg is dipped into boiling water at 100^0C and then placed in a calorimeter of mass 60g containing 50g of water at 0^0C. After stirring, the temperature of the mixture was 25^0C. Determine the specific heat capacity of the metal
(specific heat capacity of the calorimeter = 370Jkg^{-1}K^{-1} and specific heat capacity of wate = 4200Jkg^{-1}K^{-1}).

(4mks

(c) Figure 13 below shows the levels attained by two liquids L_1 and L_2 after the temperature was lowered. The liquids were initially at the same level as shown by the dotted line.

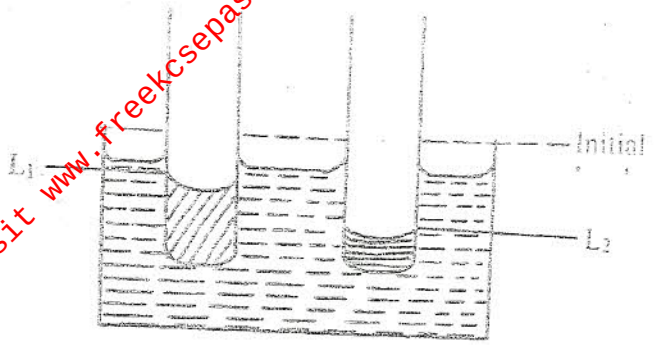

Fig. 13

(i) Mark on the diagram the levels of the liquids when the temperature is raised above the initial value. (1mk)

(ii) Give a reason for your answer in C (i) above. (1mk)

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(d) Figure 14 below shows a round bottomed flask with a glass tube inserted into water. The flask is gently heated with a Bunsen burner flame.

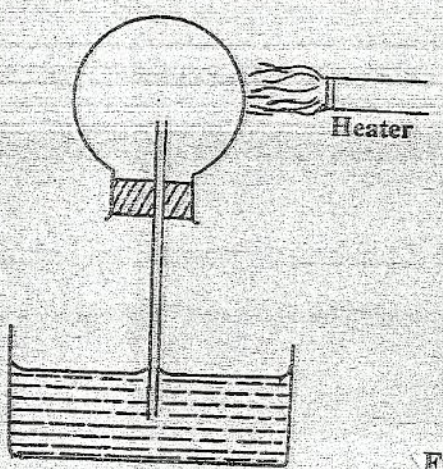

Fig. 14

Explain what happens when heating is stopped and the flask allowed to cool. (3mks)

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16. (a) State the pressure law (1mk)

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(b) (i) Explain how the apparatus in figure 15 below may be used to investigate the relationship between pressure and temperature of a gas at constant volume. (4mks)

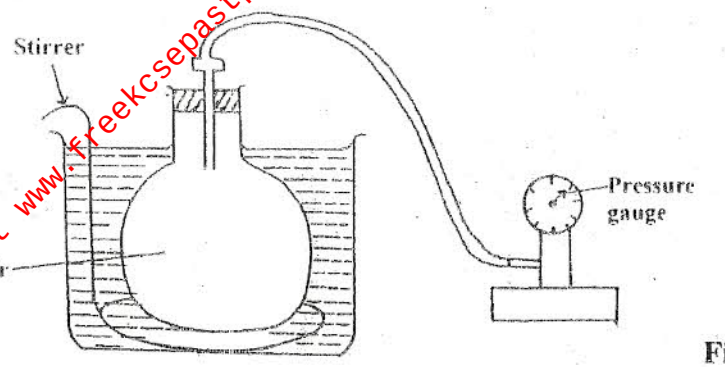

Fig 15

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(ii) Explain why the tube connecting the flask to the pressure gauge should be as short as possible. (1mk)

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(c) A rocket is propelled with a constant thrust. Assuming friction due to the air is negligible and the burning of fuel is steady. Explain its motion. (2mks)

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(d) A ball of mass 65g moving on a horizontal surface at a velocity V, collides with a stationary wooden block of mass 1kg. It bounces back along the same path at a velocity of 2.0m/s while the block moves forward at a velocity of 0.5m/s. Determine the velocity V. (3mks)

(b) You are provided with the following apparatus

- A spring balance
- A stone
- Eureka can
- A string
- A measuring cylinder
- Some water

Describe how the apparatus given may be used to verify Archimedes principle. (4mks)

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(c) A balloon of negligible weight and volume of $100m^3$ is filled with gas of density $0.2kg/m^3$. Given that the density of air is $1.25kg/m^3$, calculate,

(i) the upthrust on the balloon (3mks)

(ii) the lifting force on the balloon. (3mks)