

NAME.....INDEX NO.....DATE.....  
SCHOOL.....SIGNATURE.....

232/1  
PHYSICS  
PAPER 1  
JULY/AUGUST 2010  
2hr 30min

# LAICOMET

## Kenya Certificate of Secondary Education 2010

232/1  
PHYSICS  
Paper 1  
TIME : 2HOURS

### Instructions:

- ❖ Write your name index number in the spaces provided above.
- ❖ This paper consists of **TWO** sections:
- ❖ Answer **ALL** the questions in the space provided
- ❖ All working **MUST** be clearly shown
- ❖ Mathematical tables and calculators may be used

Take :acceleration due to gravity  $g = 10m/s^2$

Density of water  $\rho = 1000kg/m^3$

### For examiners use only

Section	Question	Maximum score	Candidates score
A	1 – 11	25	
B	12	13	
	13	10	
	14	12	
	15	10	
	16	10	

**SECTION 25 MARKS**

1. a) Draw a scale of vernier calipers whose reading is  $0.06\text{cm}$  ( 2 mks)

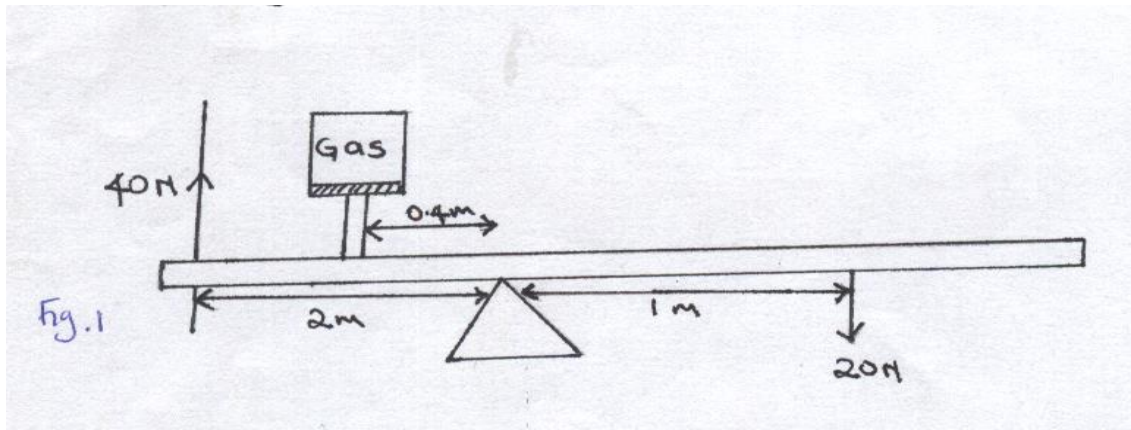
b) The reading given above is the diameter of a sphere whose mass is  $40\text{g}$  .  
Calculate its density (2mks)

2. A body dropped from rest falls half its total distance in the last second before it strikes the ground.  
From what height was it released (3mks)

3. Explain the following observation;  
Rain drops falling freely are spherical (1mk)

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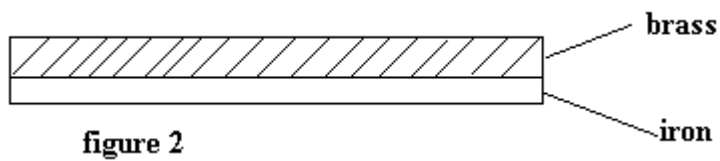
4. The figure below shows a force of  $40\text{N}$  being applied to exert pressure on a gas in cylinder



**Figure 1.**

The area of the piston is  $10\text{cm}^2$  and the volume of the gas is  $20\text{cm}^3$ . Calculate the pressure exerted by the piston on gas. (3mks)

5. The diagram in figure 2 below shows a bimetallic strip at room temperature

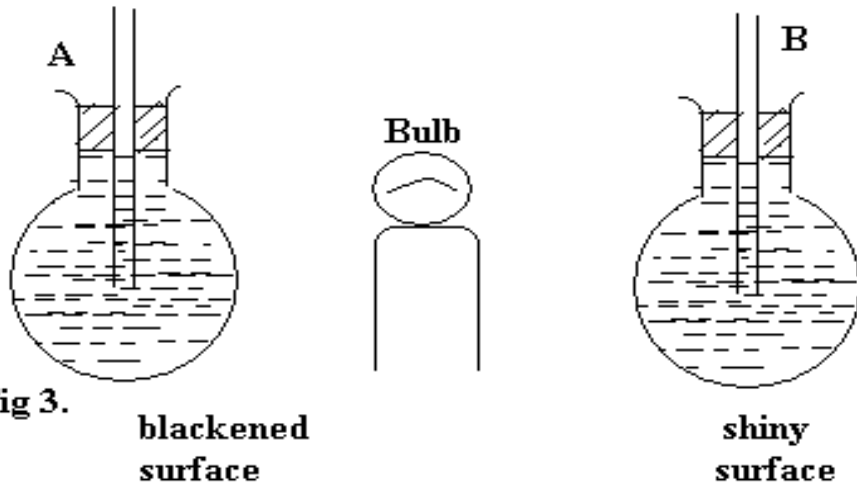


Sketch a diagram to show the appearance of the bimetallic strip if put below  $0^\circ\text{C}$

(1mk)

6. The figures below shows two identical flasks A and B filled with water

Show the levels of water one minute after the bulb placed in between the flasks is switched on



**Fig 3.**  
**blackened surface**

**shiny surface**

Explain your observations (2mks)

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7. A force of  $6N$  extends a spring by  $0.2cm$ . Calculate the work done in extending the spring (3mks)

8. State two factors that may be considered when designing the body of a racing car to enhance stability. (2 mks)

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9. Water flow in a pipe of varying cross-section as shown in figure 4 below

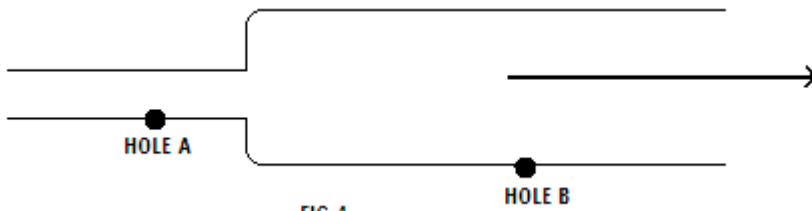


FIG.4

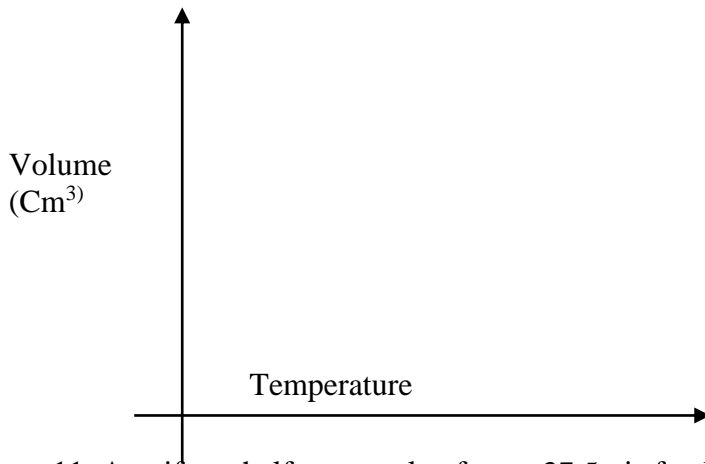
Hole A and B develops with time on the pipe if they holes have the same dimensions suggest with reason which hole leaks ( 2mks)

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10. On the axis shown in figures below Sketch a graph to illustrate Charle’s law (1mk)



11. A uniform half metre rule of mass 37.5 g is freely pivoted at 10cm mark. At what mark should a body of mass 75 g be suspended for the system to balance (3mks)

**SECTION B 55 MARKS**

12. a) Define specific latent heat of fusion of a substance (1mk)

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b) A 4g mass is receiving heat at the rate 100KJ per minutes and its temperature at various times recorded as follows

Time $t(\text{min})$	0	1	2	6	13	18	23	28	29	30
Temperature $T(k)$	230	250	270	270	270	310	350	390	390	390

(i) Plot a graph of temperature against time on the grid provided (4mks)

# GRAPH

(ii) Use your graph to find

- a The specific heat capacity of the substance in its liquid state ( 3mk)
- b Its boiling point (1mk)
- c Its melting point (1mk)
- d The specific latent heat of fusion of the substances (3mks)

13. a) A body in a uniform circular motion experience acceleration despite having constant velocity. Explain (2mk)

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b) A car travelling with uniform speed on a level circular path is likely to experience skidding experience (2 mk)

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c) The figures below shows a 40g wooden block being whirled with uniform speed in a horizontal circular path of radius 20cm . If it takes 0.5 seconds to describe an area of length 12cm

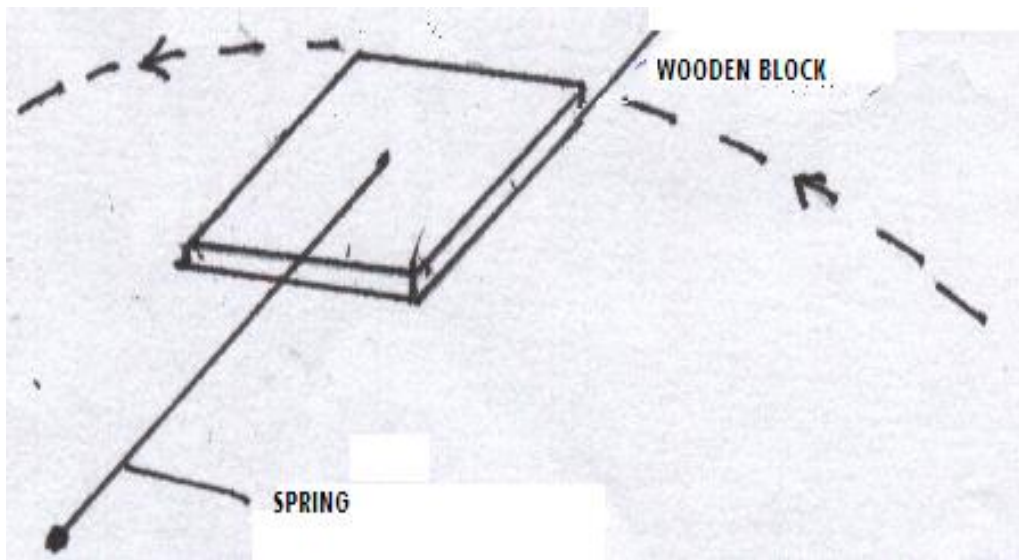


Figure 6

i Identify the forces acting on the wooden block (2 mk)

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ii Determine the linear velocity of the block (2mk)

iii Determine the centripetal force

(2mk)

14. a) Define the term inertia

(2mk)

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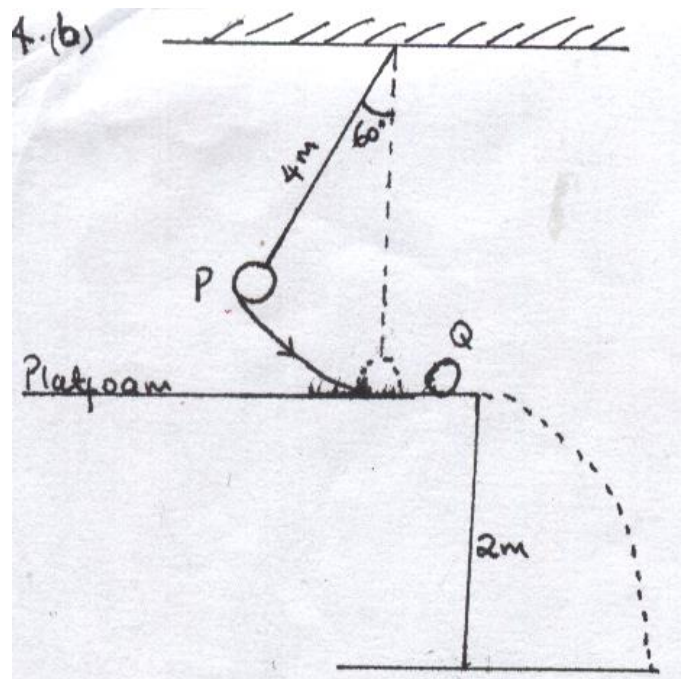
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b) A body P of mass  $4\text{kg}$  supported on a light cord  $4\text{m}$  long is held at an angle of  $60^\circ$  from the vertical position as shown in figure 7.

A second body Q of mass  $1\text{kg}$  rest at the edge of a platform  $2.0\text{m}$  high the body is released and strike body Q head on in a perfectly elastic collision





(i) Explain the term elastic collision (2 mk)

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(ii) Determine how long it takes after P is released for body  $\mathcal{G}$  to strike the ground (4mks)

(iii) How far from the base of the platform will the body  $\mathcal{G}$  strike the ground if P stops after the collision (2mk)

(c) A parachutist allows his legs to bend and rolls over on the ground when he lands. Explain (2mk)

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15. a) Draw a diagram of block and tackle pulley system which has a velocity ratio of 2 (2 mk)

b).The pulley system in (a) above was used to find the relation between load and minimum effort required to raise the loads. The results obtained are shown below.

Load (N)	1.0	2.0	3.0	4.0	5.0	6.0
Effort(N)	1.0	1.5	2.0	2.5	3.0	3.5
Mechanical advantage		1.33			1.67	1.71
Efficiency %		66.5			83.5	85.5

(i) Complete the table above (2mk)

(ii) Plot a graph of efficiency ( y- axis) against load on the graph paper provided on the next page. (4mk)

(iii) Estimate the maximum useful efficiency from the graph for large load. (1mk)

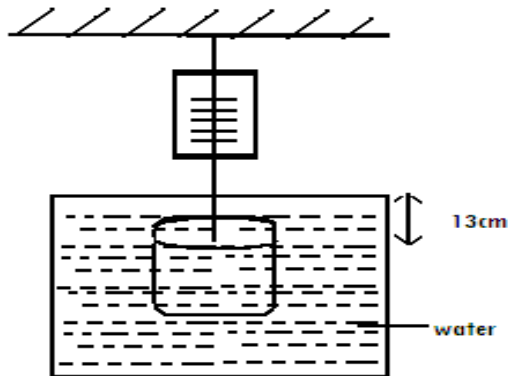
(iv) State one reason for pulley system being less than 100% efficiency. (1mk)

# graph

16. a. State the law of floatation (1mk)

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**b** A solid metal block cross-section area  $4\text{cm}^2$  and of density  $2500\text{ g / m}^3$  is fully immersed in water , supported by a spring balance



(i) A part from the weight , state and indicate the direction of any two forces acting on the metal block (2mk)

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(ii) If the upward force acting on the bottom face is  $1.5\text{N}$  ,Calculate the volume of the block (3mk)

(iii) Calculate the apparent weight of block in water

(3mk)

c) What is purpose of lead shot in hydrometer (1mk)

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