LEARNER'S NAME:		STREAM:	

LEARNER'S NO.					STUDY GROUP'S NAME:	

Physics
Paper 2023
$2^{1}/_{4}$hours

THE PHYSICS DEPARTMENT 2023

Uganda Certificate of Lower Secondary Education

S.3 Beginning of term.11. Assessment

2 Hours 15 Minutes

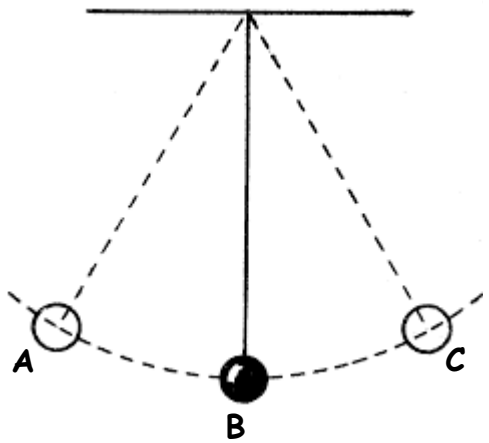
INSTRUCTIONS

- Use the blue or black ink pen only
- Attempt **ALL** questions in section A and any **TWO** questions in section B

SECTION A

Attempt all questions in this section

1. Figure 1 below shows a swinging pendulum bob



At which point does the bob attain

(i) The highest speed (01mark)

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(ii) Maximum kinetic energy (01mark)

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(iii) Maximum potential (02marks)

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2. Figure 2 below shows water in a container

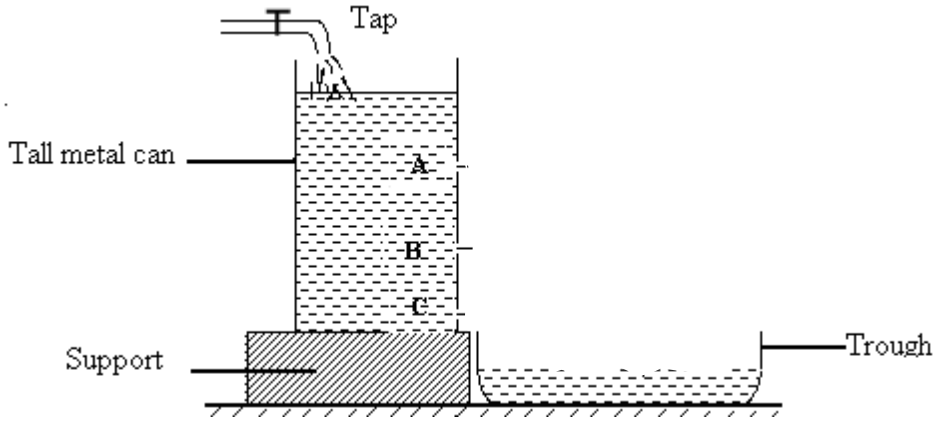

fig.2

(a) Complete the diagram to show the flow of water through A, B, C and briefly explain your diagram. (04marks)

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(b) Why does an elephant walk easily in mud than a goat? (02marks)

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3. A brick of mass 3.0kg and dimensions 5.0cm x 3.0cm x 2.0cm rests on different sides on the laboratory table. Calculate the

(a) Maximum pressure (02marks)

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(b) Minimum pressure (02marks)

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4. (a) State Pascal's principle (01mark)

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(b) Identify devices that apply Pascal's law of transmission of pressure in liquids (03marks)

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5. (a) The figure below shows an application of density in real life. Identify and name the object in the picture and explain how it uses knowledge of density to travel both under the water and on surface of water (02marks)

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(b) A cube measures **3.0cm** on each side and has a mass of **25g**. What is the density of the cube? Will the cube float in water? Will it float in benzene? (Density of benzene = **0.88 g/ml** and that of water is **1 g/cm^3**) (03marks)

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6. (a)Define force (01mark)

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(b)State any three effects of a force (03marks)

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7.

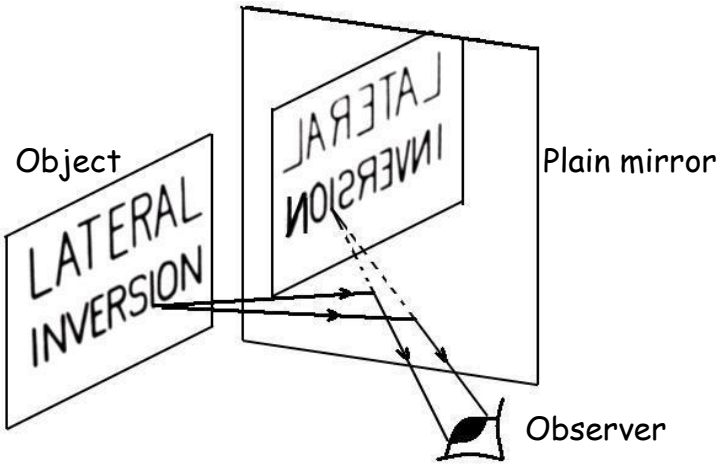

Fig.3

(a) State the characteristics of the image formed in the diagram above (02marks)

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(b) Give two practical applications of a convex mirror (02marks)

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8. (a) Distinguish between potential energy and kinetic energy (02marks)

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(b) At a playground, Musa of 25Kg mass climbs up a concrete slide of 2.3m height and slides down the slope. At the end of the slope, which is 0.3m above the ground, his velocity is $1ms^{-1}$.what is his change in potential energy. (02marks)

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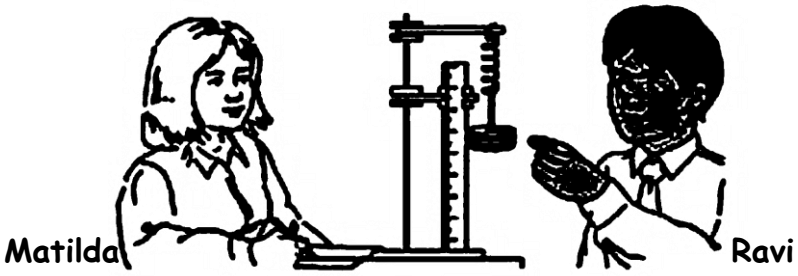
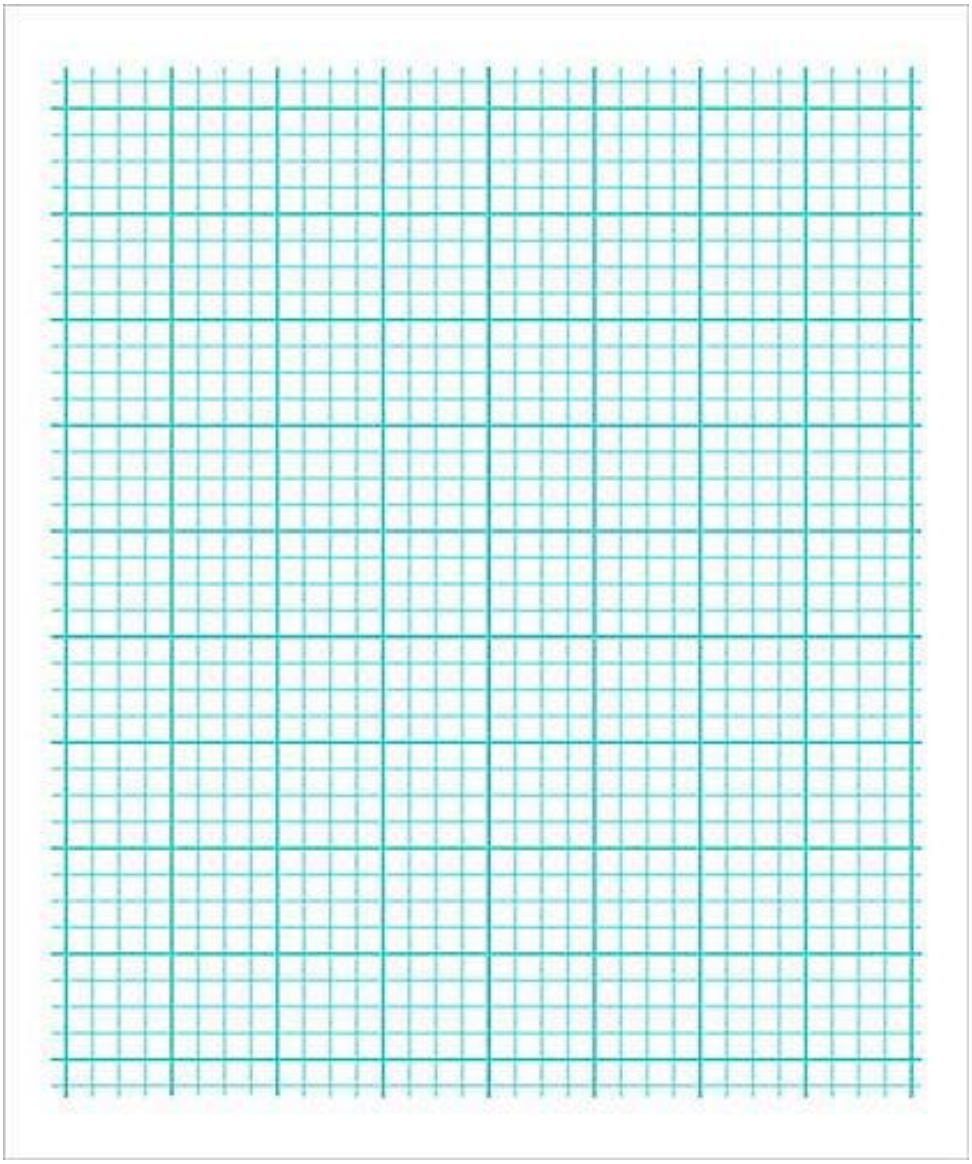
9. Matilda and Ravi carried out an experiment with springs. They put different masses on the spring and measured the length of the spring each time.



Their results are shown in the table below

Mass (g)	Weight (N)	Length (cm)
0	0	10
200	2	14
400	4	18
600	6	22
800	8	26
1000	10	30

(a) Draw a graph to show the results. (04marks)



(b) Write the best conclusion for this experiment from the graph drawn.

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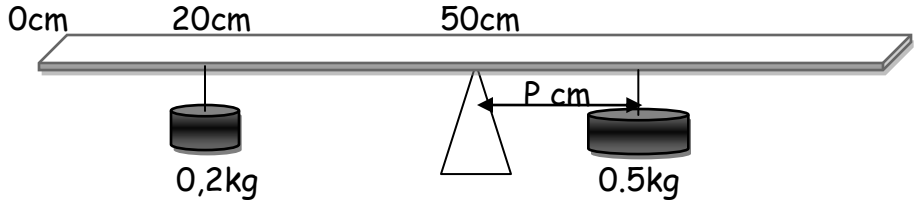
SECTION B

Attempt only **TWO** *questions from this section*

10. A uniform meter rule of negligible weight is balanced horizontally on a knife edge at its middle when masses of 0.2kg and 0.5kg are hang from the 20cm and point p cm mark as shown in fig below



(a) What is meant by the term uniform meter rule? (02 marks)

(b) Calculate the distances of the 0.2kg mass and 0.5kgfrom the pivot (04 marks)

(c) Calculate the moments due to the 0.2kg and 0.5kg masses about the pivot (06 marks)

(d) What is meant by the following terms? (04marks)

(i) Parallel forces

(ii) Like and unlike forces

(iii) Couple

(e) State the conditions for a body to be in equilibrium (04marks)

11. (a) Explain why it is important to observe laboratory rules and regulations (04 marks)

(b) State any five laboratory safety rule (05 marks)

(c) The diameter of a bicycle spoke is found to be 1.25mm.what is the diameter in meters (02marks)

(d) A storied building has a ground floor and three other floors. To move to another floor from the other floors you climb 12 steps each of length 20cm. what is the height of the storied building. (05 marks)

12. (a) Define pressure and state its S.1 unit (02marks)

(b) State two factors affecting pressure in solids (02marks)

(c) The diagram below shows a farm tractor

Explain why it is made of large tyres (03marks)

(d) State Pascal's principle (02marks)

(e) The driver exerts a force of 500N on the brake pedal. The master cylinder piston in a car braking system has a diameter of 0.2cm .the effective area of the brake pads on

each of the four wheels is 30cm^2. Calculate the pressure in the master cylinder (04marks)

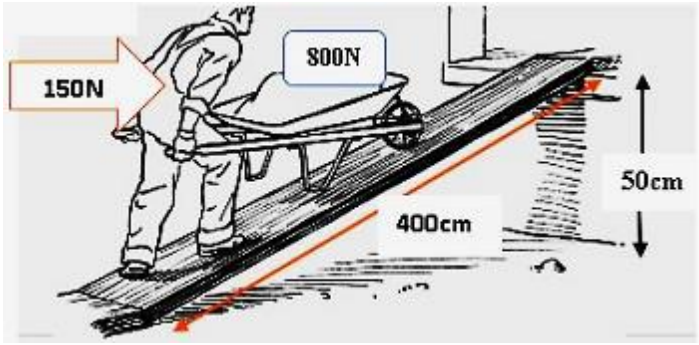
(f) List three practical applications of Pascal's principle (03marks)

(g) Distinguish between a scalar and vector quantity giving an example of each (04marks)

13. (a). (i). What is a level as applied to simple machines (01mark)

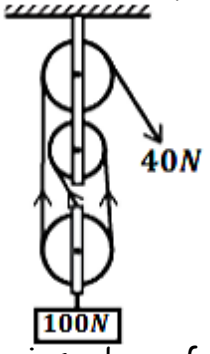
(ii). Identify the classes of level giving any two application on each. (06marks)

(b). A loaded wheelbarrow weighing **800 N** is pushed up an inclined plane by a force of **150N** parallel to the plane, if the plane rises **50 cm** for every **400 cm** length of the plane as shown below.



Find the **velocity ratio**, **mechanical advantage.** (4marks)

(C). The effort required to raise a load of **100N** is **40N** as shown below.



Calculate; (i) Mechanical advantage (2marks)

(ii) Efficiency (2marks)

(iii) Name two areas where pulleys are commonly applied in real life. (2marks)

(d). A man carries a bag of cement of mass 50kg from the ground floor to the first floor using stairs of height 0.01m each as shown in the diagram below

Determine the work done by this man to move a bag of cement from the ground floor to the first floor. (03marks)

END