NAME…… INDEX NO……. ……...…

SCHOOL……...……. CANDIDATE'S SIGNATURE…….

DATE……..

232/1
PHYSICS
PAPER 1
(THEORY)
MARCH/APRIL 2015
TIME: 2 HOURS

KABONDO DIVISION JOINT EVALUATION TEST

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

(THEORY)
MARCH/APRIL 2015
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- **Write** your name and Index number in the spaces provided
- This paper consists of two sections, A and B.
- Answer ALL the questions in the spaces provided.
- All working must be clearly shown in the spaces provided in this booklet
- Mathematical tables and Electronic calculators may be used.
  Take g = 10m/s^2

FOR EXAMINERS USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	**1-14**	**25**	
B	**15**	**11**	
	16	**11**	
	17	**12**	
	18	**10**	
	19	**11**	

TOTAL SCORE		**80**	

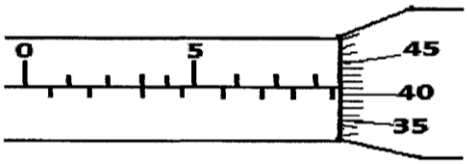
This paper consist s of 12 printed pages candidates should check the question paper to ensure all the pages are printed as indicated and no questions are missing.

SECTION A: *(25MARKS)*

Answer all questions in this section.

1. What is the actual reading of the micrometer screw gauge shown below if it has an error of+ 0.5mm?

(2marks)



……

……

2. In a ball and ring experiment, the ball goes through the rings at room temperature. When it is heated it does not go through the ring, but when left on the ring for some time, it goes through. Explain this observation. (2marks)

……

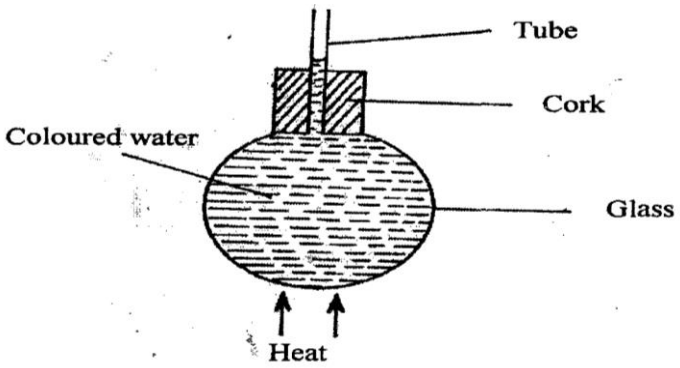
……

3. In the study of free fall, it is assumed that the force F acting on a given body of mass, m, is gravitational, given by F = mg. State two other forces that act on the same body. (2marks)

……

……

4. In the set up shown below, it is observed that the level of the water initially drops before starting to rise. Explain this observation. (2marks)



5. Distinguish between speed and velocity. (1mark)

……

……

6. State how the pressure in a moving fluid varies with speed of the fluid. (1mark)

……

……

7. A piece of metal weighs 3N in air and 2N when totally immersed in water. Calculate the volume of the metal. (Density of water = 1000Kg/m^3) (3marks)

……

……

……

……

……

……

8. Why is banking of roads necessary? (1mark)

……

……

9. Give a reason why air is not commonly used as the fluid in a hydraulic lift. (1mark)

……

……

10. Tall buildings are built with lighter materials at the upper part. Explain (2marks)

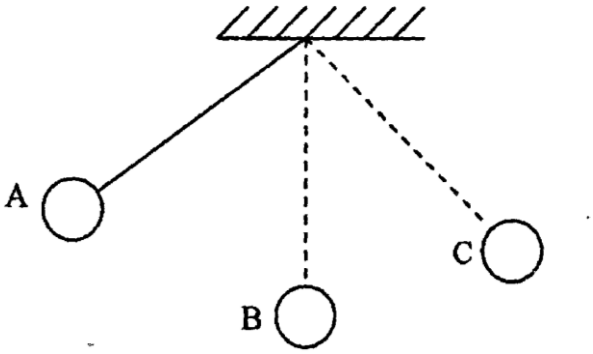
……

……

……

……

11. The figure below shows a swinging pendulum.

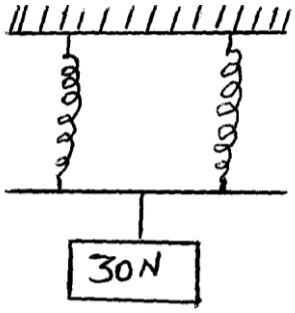


State the energy conservation taking place as the pendulum moves from A to B and B to C

A to B……

B to C……

12. The identical springs each of spring constant 3N/cm are used to support a load of 30N as shown.



Determine the extension on of each spring. (3marks)

……

……

……

……

……

……

13. In a vacuum flask, the walls enclosing the vacuum are silvered on the inside. State the reason for this. (1mark)

……

……

14. Sketch velocity — time graph of a body moving down a viscous fluid. (2marks)

SECTION B: (55 MARKS)

Answer ALL the questions in the spaces provided.

15. a) Define the term efficiency as applied in simple machine. (2marks)

……

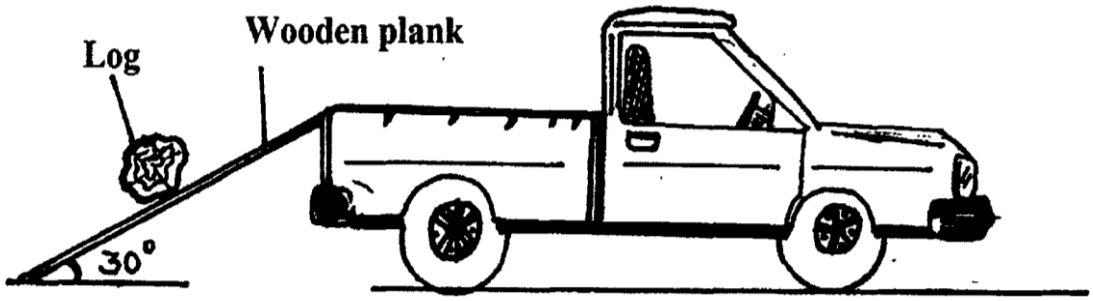
……

……

……

b) A man used a wooden plank to lift a log of wood from the ground to a stationary lorry on a flat ground as shown in figure below. The wooden plank was inclined at an angle of 30^0 to the ground.

© 2015 Kabondo Division Joint Evaluation Test



i) Indicate with an arrow on the diagram, the direction of the effort and the load. (2marks)

ii) Calculate the velocity ratio of the set up. (2marks)

……

……

……

……

iii) Calculate the mechanical advantage of the set up if its efficiency is 65%. (2marks)

……

……

……

……

……

c) A pump is used to spray water from a pool to form fountain.

i) Determine the minimum power of the pump if it ejects 50 litres of water per minute and spray reached a height of 5metres.(Density of water = 1000Kg/m^3) (3marks)

……

……

……

……

……

© 2015 Kabondo Division Joint Evaluation Test

ii) Give a reason why water from the pump has a different temperature from that which left the pool. (1mark)

……

……

16. a) Define centre of gravity (lmark)

……

……

b) The figure below shows a wine glass

Explain how the stability of the glass is affected if it is filled with wine. (2marks)

……

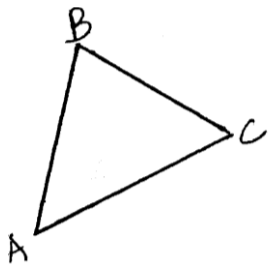
……

……

……

c) In the triangular ABC shown in the figure below, determine geometrically the position of centre of gravity. (1mark)

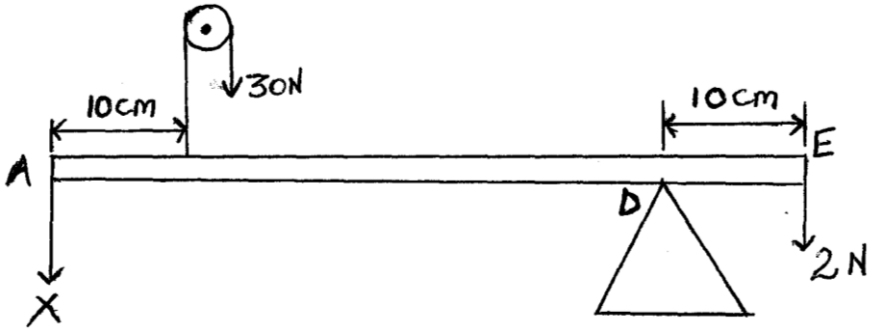
© 2015 Kabondo Division Joint Evaluation Test



……

……

d) The figure below shows a uniform rod AE which is 40cm long. It has a mass of 2kg pivoted at D. If 2N is acting at point E, and 30N force is passed through a frictionless pulley.



Find the force (x) acting at end A. (3marks)

……

……

……

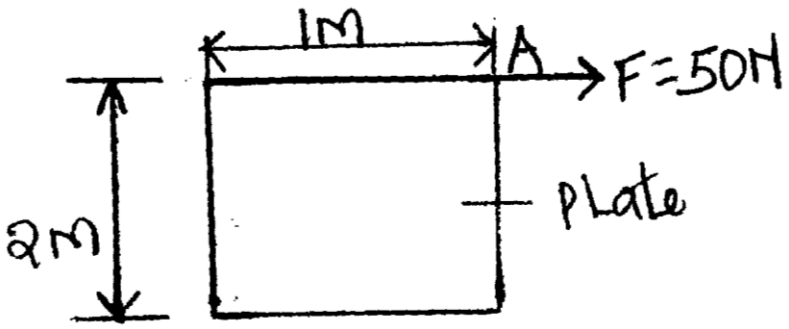
……

e) i) State the principle of moments. (1mark)

……

……

ii) The figure below shows a metal plate 2M long, 1M wide and negligible thickness A horizontal force of 50N applied at point 'A' just makes the plate tilt.



Determine the weight of the plate. (3marks)

……

……

……

……

……

……

17. a) State one factor that affects melting point of water. (1mark)

……

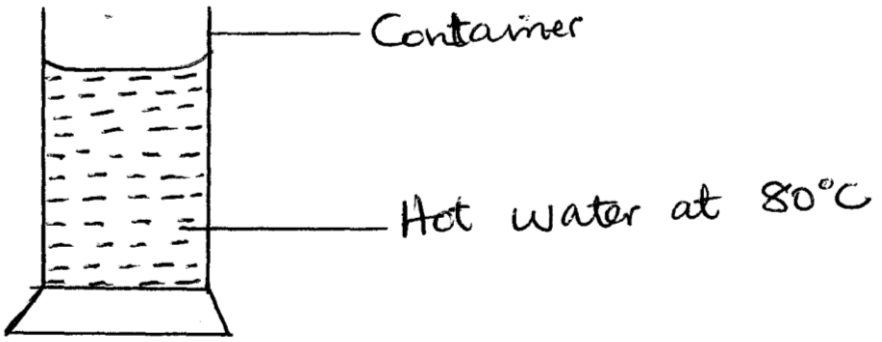
……

b) Define the term *specific heat capacity* of a substance (1mark)

……

……

c) The figure below shows a container carrying *0.5* Kg of water at 80°C



A metal block of mass 1Kg and specific heat capacity $4000Jkg^{-1}k^{-1}$ at a temperature of 25°C is lowered into the hot water. The container losses 600J of heat during mixing and a steady final temperature of the mixture obtained is **T**. Assume no further heat is lost to the surrounding and specific heat capacity of water is $4200Jkg^{-1}k^{-1}$

I. Derive the expression for:

i) The heat lost by the hot water. (2mks)

ii) The total heat lost by hot water and the container (2mks)

II. Determine the steady temperature **T** of the mixture (3mks)

d) Water drops from a water fall 120m High. The temperature of the water at the bottom is found to be 24°C. Calculate its temperature at the top
(Take specific heat capacity of water = $4200Jkg^{-1}k^{-1}$) (3marks)

……

……

……

……

……

……

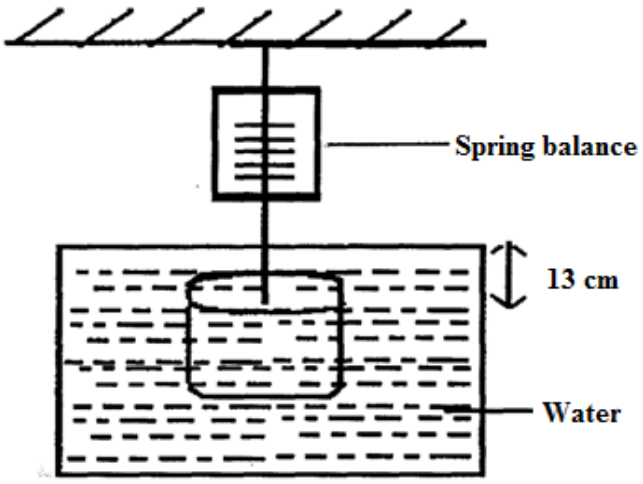
18. a) State the law of floatation (1mark)

……

……

……

b) A solid metal block cross-section area $4cm^2$ and of density $2.5g/cm^3$ 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 (2marks)

……

……

……

ii) If the upward force acting on the bottom face is 1.5N, calculate the volume of the block (Density of water = 1000kg/cm^3) (3marks)

……

……

……

……

iii) Determine the apparent weight of block in water. (3marks)

……

……

……

……

……

……

(c) Explain why the hydrometer is not graduated uniformly. (1marks)

……

……

19. (a) Using Kinetic theory of Gases, explain how the rise in temperature of a gas causes rise in the pressure of a gas if the volume is kept constant. (3marks)

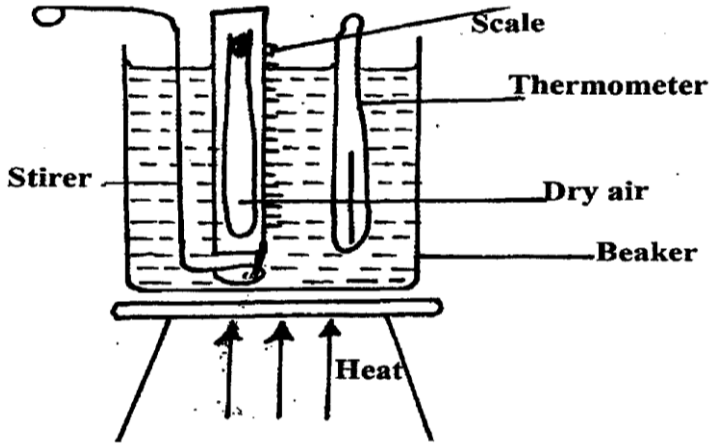
……

……

……

……

(b) The figure below is a set up that can be used to verify Charles' law of gases.



i) State two measurements that should be taken in the experiment. (2marks)

……

……

……

……

ii) Explain how the measurements taken above can be used to verify Charles law. (3marks)

……

……

……

……

……

……

c) A certain mass of hydrogen gas occupies a volume of $2.6m^3$ at a pressure of 1.5×10^5 pa and temperature of 12°C. Determine its volume at a temperature of 0°C, if its pressure is 1.0×10^5 pa. (3 marks)

……

……

……

……

© 2015 Kabondo Division Joint Evaluation Test

.....

.....

NAME…… INDEX NO……. ……...…

SCHOOL……...……. CANDIDATE'S SIGNATURE…….

DATE……..

232/2
PHYSICS
PAPER 2
(THEORY)
MARCH/APRIL 2015
TIME: 2 HOURS

KABONDO DIVISION JOINT EVALUATION TEST

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

(THEORY)
MARCH/APRIL 2015
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

- Write your name and Index number in the spaces provided
- This paper consists of two sections, A and B.
- Answer ALL the questions in the spaces provided.
- All working must be clearly shown in the spaces provided in this booklet
- Mathematical tables and Electronic calculators may be used.

FOR EXAMINERS USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	**1-11**	**25**	
B	**12**	**10**	
	13	**13**	
	14	**11**	
	15	**11**	
	16	**10**	

© 2015 Kabondo Division Joint Evaluation Test

TOTAL SCORE		**80**	

This paper consist s of 12 printed pages candidates should check the question paper to ensure all the pages are3 printed as indicated and no** questions **are missing.

SECTION A: (25MARKS)

1. State any two ways of increasing the size of an image formed by a fixed pinhole camera. (2marks)

……

……

……

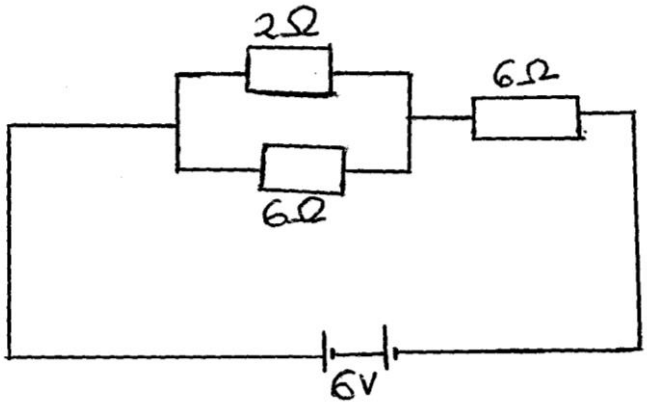
……

2. State one advantages of an alkaline battery over a lead acid battery. (lmark)

……

……

3.



The figure above shows a 6V battery connected to an arrangement of resistors. Determine the current flowing through the 2Ω resistor. (3marks)

……

……

……

……

4. A negatively charged rod is brought near the cap of a lightly charged electroscope. The leaf divergence first reduces but as the rod comes nearer, it diverges more.

© 2015 Kabondo Division Joint Evaluation Test

i) State the charge of the electroscope (1 mark)

……

……

……

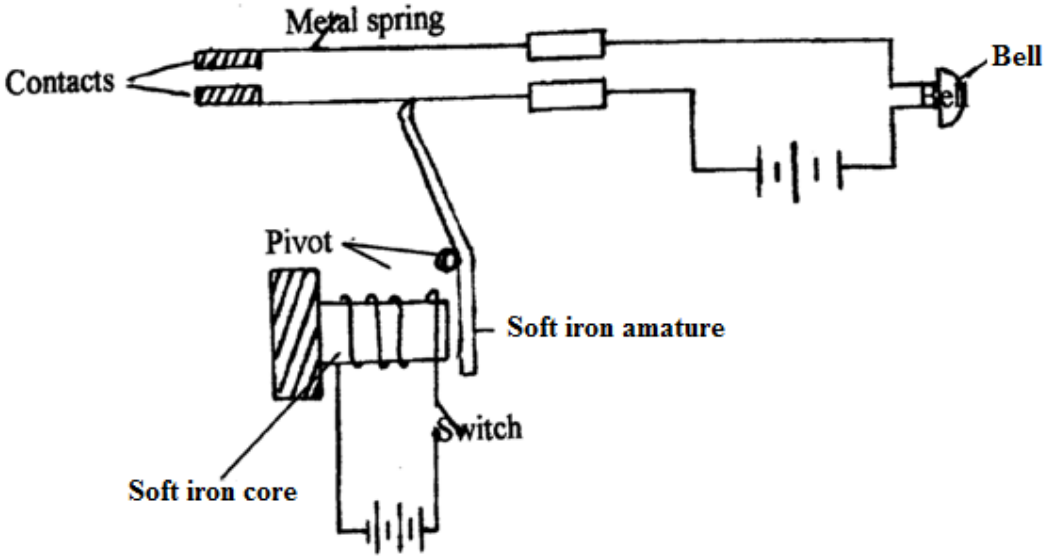
……

ii) Explain the behaviour of the leaf above. (1 mark)

……

……

5. The figure below shows an electromagnetic relay.



Explain what happened when the switch is closed. (3marks)

……

……

……

……

……

……

6. A current 12 A flows through a circuit for 2.5 minutes. How much charge passes through the circuit? (2marks)

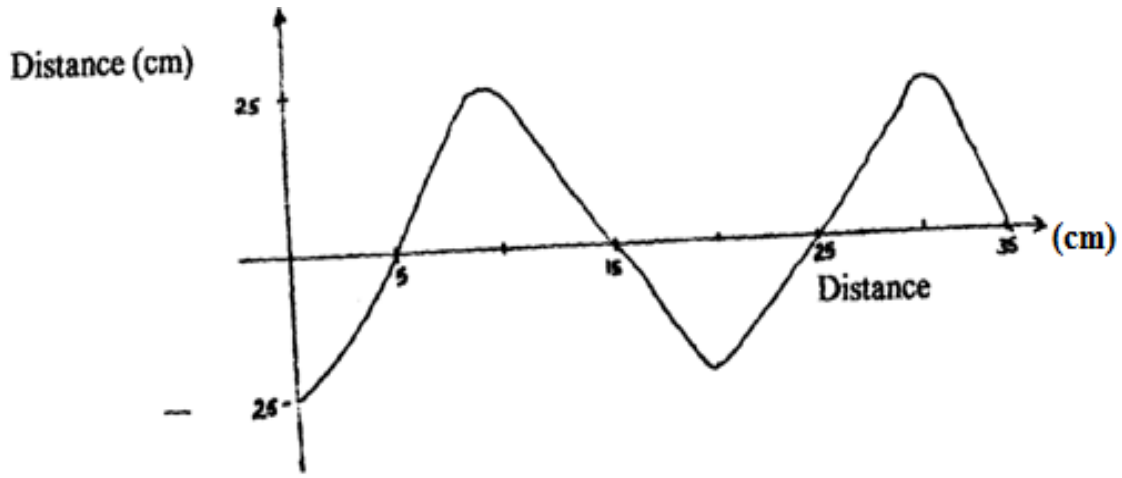
……

……

……

……

7. The diagram below shows part of a wave form. The numbers on the diagram show scales in centimeters. The speed of the wave is $16ms^{-1}$



From the graph of the wave shown, determine;

a) The wavelength (1mark)

……

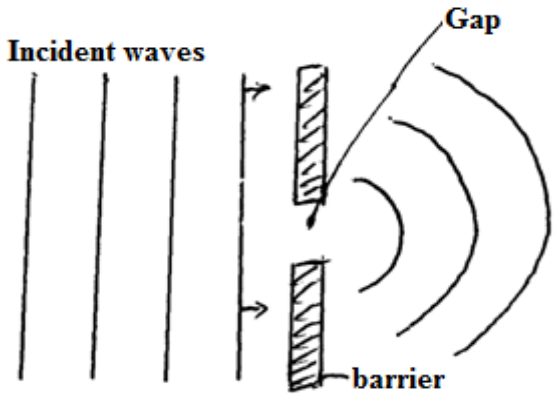
……

b) The frequency

……

……

8. Figure below shows wavefront before and after passing through an opening as shown in fig.5.



State what would be observed on the pattern after passing the opening if:

i) Wave length is increased. (1mark)

……

……

ii) Gap is increased. (1mark)

……

……

9. State two ways by which the frequency of a note produced by a sonometer wire may be increased. (2marks)

……

……

……

10. An electric kettle rated at 2.0kW, 240V is filled with water. If the water requires 7.0×10^5 Joules of heat to boil from the initial temperature, determine the resistance of the element. (3marks)

……

……

……

……

© 2015 Kabondo Division Joint Evaluation Test

11. A certain glass material has a refractive index of *2.5*. What is its critical angle? (2marks)

……

……

……

SECTION B: (55 MARKS)

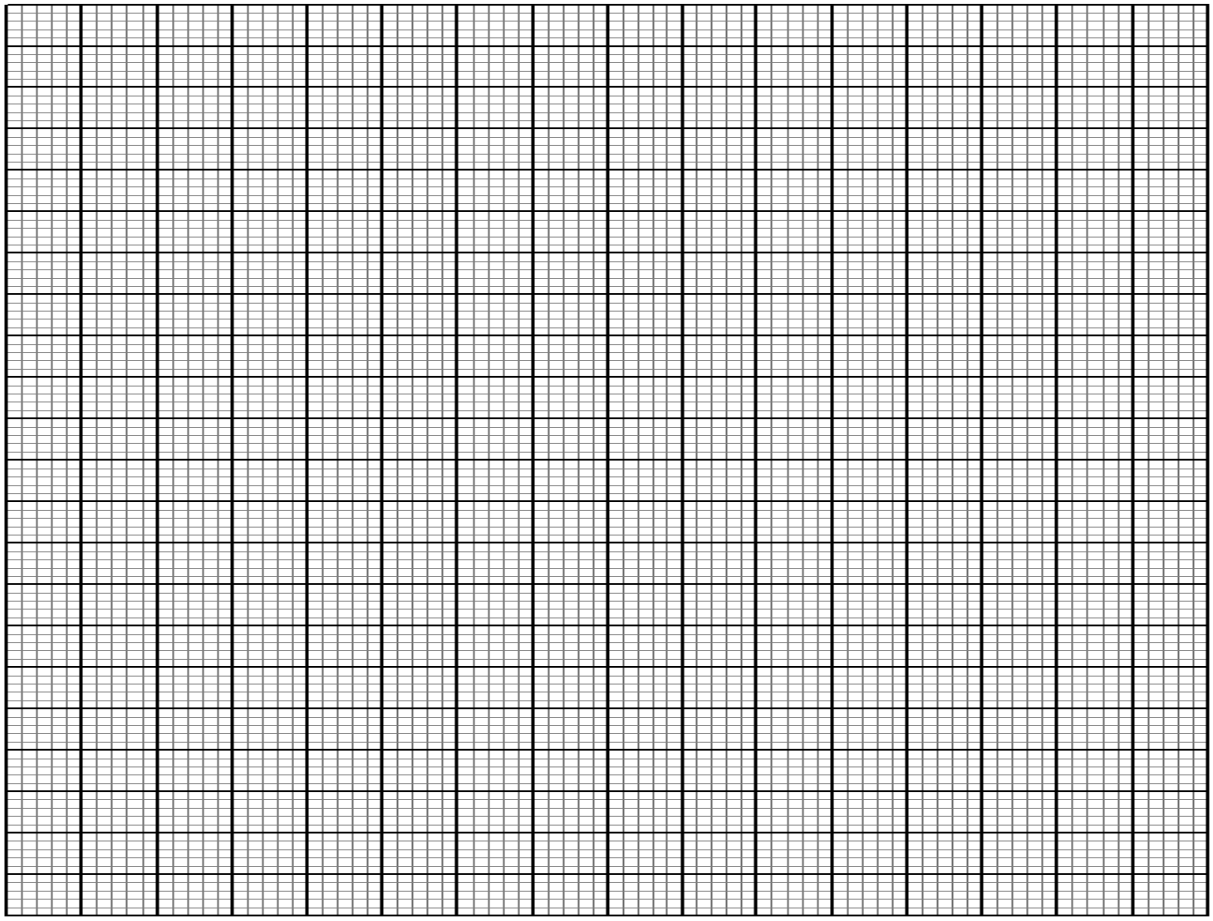
12. A student carried out an experiment to investigate how current varies with potential difference applied across a filament lamp. The following readings were obtained.

Rd(V)	0	0.20	0.40	0.60	0.80	1.20	1.60	2.40
I(A)	0.0	0.11	0.20	0.28	0.34	0.43	0.50	0.58

Draw a diagram for the circuit used to obtain the values. (2marks)

b) Plot a graph of V against I for the values presented in the table. (5marks)

© 2015 Kabondo Division Joint Evaluation Test



Determine the resistance of the lamp when a current of O.4A flows through it. (3marks)

……

……

……

……

……

……

13. a) Define the term *principal focus* in relation to a thin convex lens (1 mark)

……

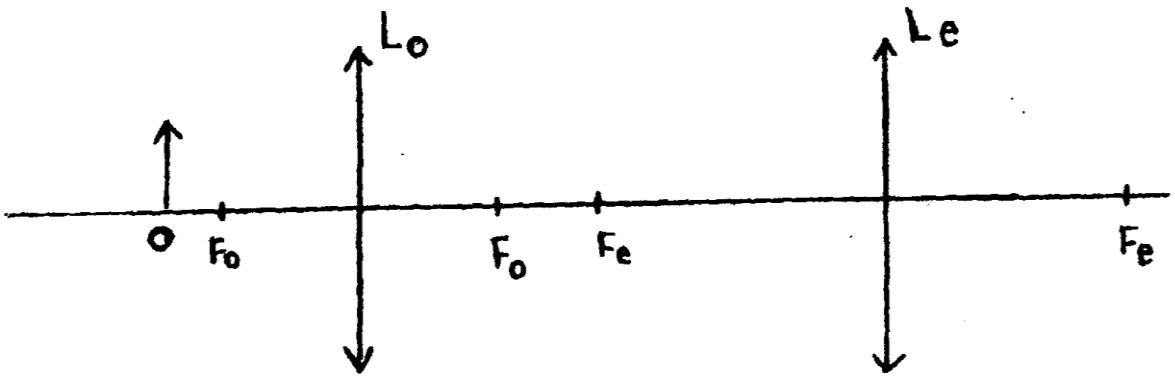
……

b) Distinguish between a real and virtual image. (1 mark)

……

……

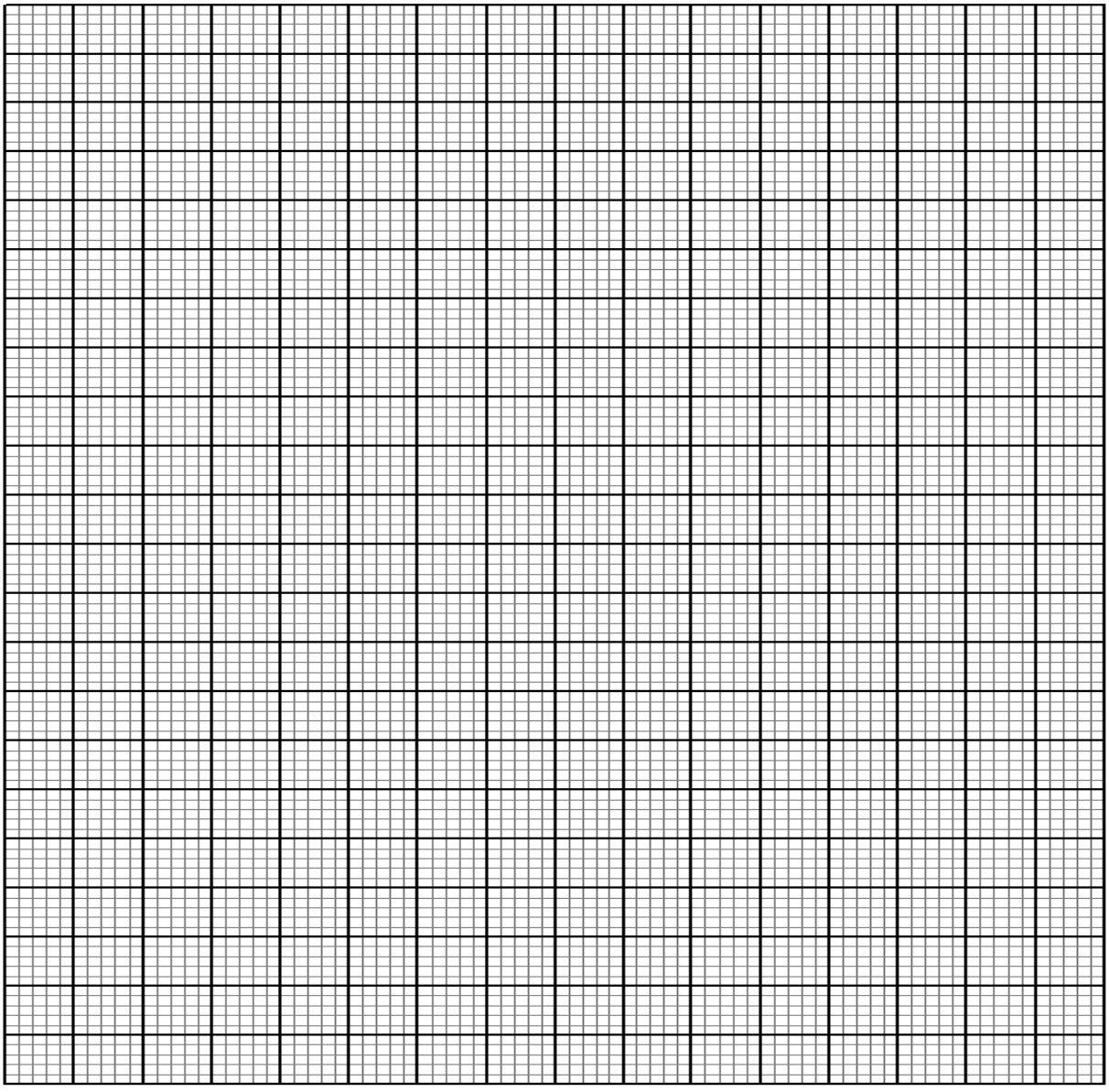
c) The diagram shows an arrangement of lenses; L_0 and L_e used in a compound microscope F_0 and F_e are principal foci of L_0 and L_e respectively.
Draw the rays to show how the final image is formed in the microscope. (3marks)



(d) The table below shows the object distance, U and the corresponding image distance, V for an object placed.

U (cm)	20	25	30	35	40	45
V(cm)						
$\frac{1}{u}\left(cm^{-1}\right)$						
$\frac{1}{v}\left(cm^{-1}\right)$						

(i) Complete the table and plot a graph of $\frac{1}{v}$ against $\frac{1}{u}$ (7marks)



(ii) Determine the focal length of the lens. (2marks)

……

……

© 2015 Kabondo Division Joint Evaluation Test

……

……

14. a) Give two conditions necessary for total internal reflection to occur. (2marks)

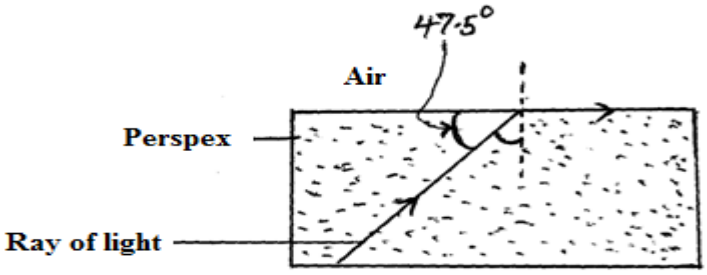
……

……

……

……

b) Figure below shows the path of a ray of light passing through a rectangular block of Perspex to air.



Calculate the refractive index of Perspex. (3marks)

……

……

……

……

……

……

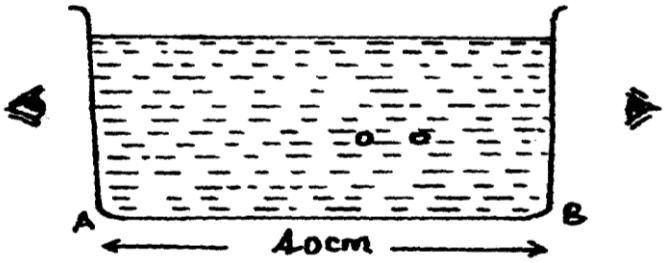
c) Give one use of an optical fibre (1 mark)

……

……

d) In a transparent liquid container, an air bubbles appears to be 18cm when viewed from

end A and 12cm when viewed from end B as shown in figure below. Where exactly is the air bubble. If the length of the tank is 40cm? (4marks)



……

……

……

……

……

……

……

……

15. a) i) Distinguish between longitudinal and transverse waves. (1mark)

……

……

ii) State one distinction between the way sound waves and electromagnetic waves are transmitted. (1 mark)

……

……

b) A mine worker stands between two vertical cliffs 400m from the nearest cliff. The cliffs are X m apart, every time he strikes the rock once, he hears two echoes, the first one in *2.5s* while the second follows 2s later. From this information calculate:

i) The speed of sound in air. (2marks)

……

……

© 2015 Kabondo Division Joint Evaluation Test

……

……

ii) The value of X. (3marks)

……

……

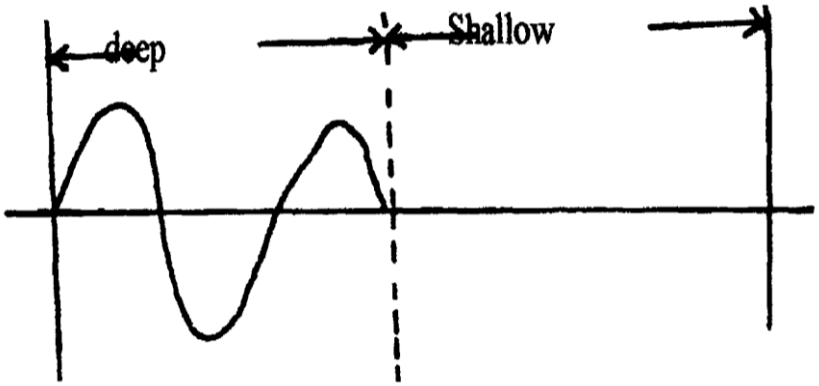
……

……

……

……

c) Figure 12 below shows the displacement of a particle in progressive wave incident on a boundary between deep and shallow regions.



i) Complete the diagram to show what is observed beyond the boundary. (Assume no loss of energy) (2marks)

ii) Explain the observation in C (i) above. (2marks)

……

……

……

……

© 2015 Kabondo Division Joint Evaluation Test

16. (a) State two factors that affect the capacitance of a parallel plate capacitor. (2marks)

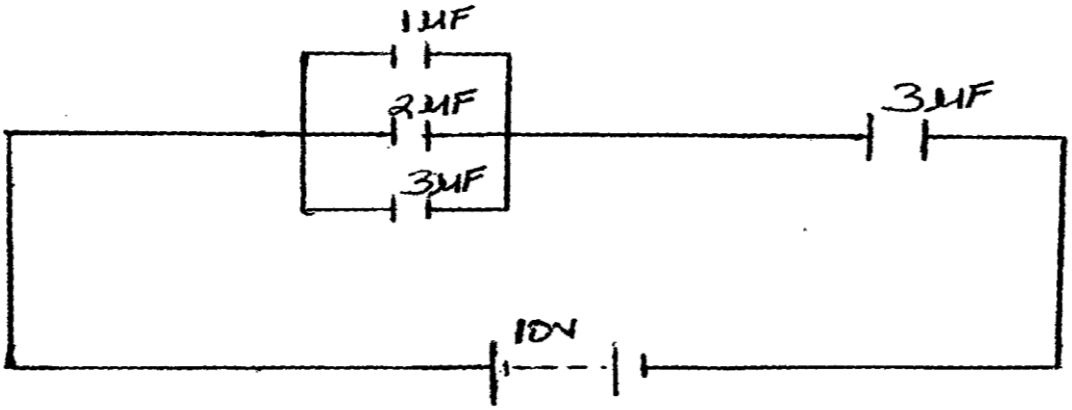
……

……

……

……

(b) The diagram below shows an arrangement of capacitors in a circuit.



Determine;

i) The total capacitance (3marks)

……

……

……

……

© 2015 Kabondo Division Joint Evaluation Test

……

……

ii) The total charge (2marks)

……

……

……

……

iii) The energy stored by the $2\mu F$ capacitor. (3marks)

……

……

……

……

……

……

NAME…… INDEX NO……. ……...…

SCHOOL……...……. CANDIDATE'S SIGNATURE…….

DATE……..

232/3
PHYSICS
PAPER 3
(PRACTICAL)
MARCH/APRIL 2015
TIME: 1½ HOURS

KABONDO DIVISION JOINT EVALUATION TEST

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

(PRACTICAL)
MARCH/APRIL 2015
TIME: 1½ HOURS

INSTRUCTIONS TO CANDIDATES

- This paper consists of two questions
- Answer all questions in the spaces provided
- All workings **must** be clearly shown in the spaces provided.
- Mathematical tables and Non –programmable silent electronic calculators may be used

FOR EXAMINERS USE ONLY

Question 1

	a	d	e(i)	e(ii)	e(iii)
Maximum score	1	8	5	3	3
Candidates Score					

Total

Question 2

	viii	ix	x	xi	xii	drawing
Maximum score	1	8	5	3	3	3
Candidates Score						

Total

Grand Total

© 2015 Kabondo Division Joint Evaluation Test

This paper consist s of 7 printed pages candidates should check the question paper to ensure all the pages are3 printed as indicated and no questions are missing

1. You are provided with the following apparatus
   - Voltmeter
   - A milliammeter
   - A wire mounted on a milliameter scale
   - A switch
   - A crocodile clip
   - One cell and one cell holder
   - A micrometer screw gauge [to be shared]
   - Six connecting wires [two with Crocodile clip]

Procedure as follows

a). Measure the diameter of the mounted wire at three different points

d1= _____ mm

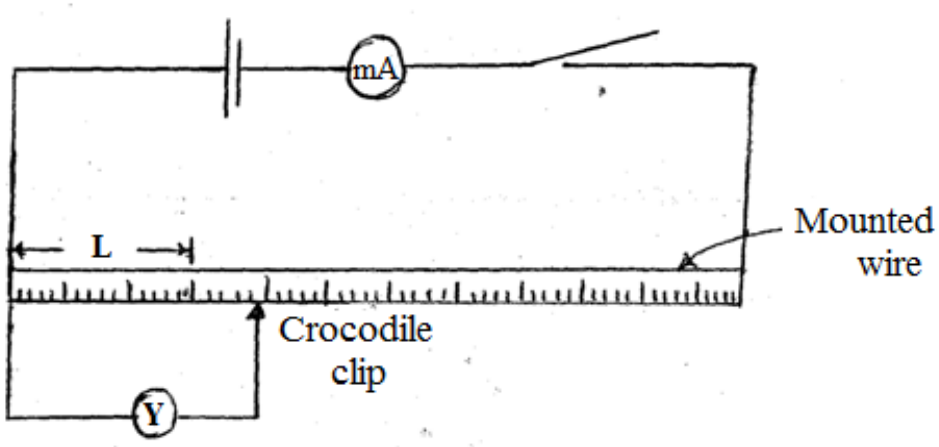
d2= _____ mm

d3=_____ mm

Average diameter d = _____ mm (1mk)

b). Set up the apparatus as shown in the circuit in fig 1.

Fig 1



Close the switch S and tap the mounted wire with crocodile clip.

Ensure both meters show positive deflection. Open the switch

c). Press the crocodile clip on the mounted wire at point L = 20cm close the switch, read and record in the table I the milliameter and voltmeter readings.

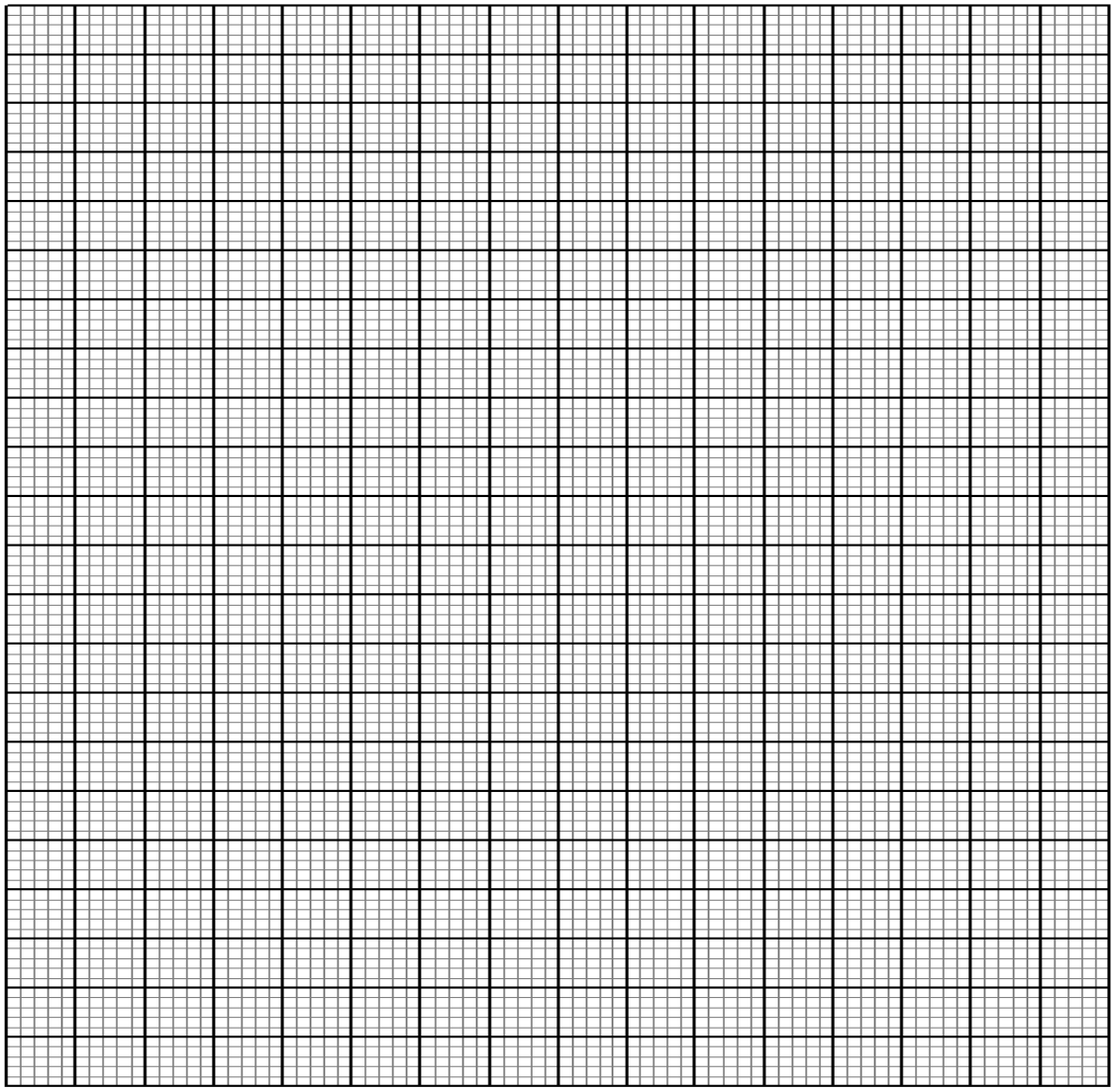
d). Repeat the procedure in [c} for other values of L shown in the table.s

Table 1

Length L (cm)	20	30	40	50	60	80
P.d (Volts)						
Current I(mA)						
Current I(A)						
R = $V/_1$ (Ω)						

Complete the table (8mks)

e). i. On the grid provided plot a graph of R(y-axis) against L (m) (5mks)



(ii) Determine the slope of the graph. (3mks)

(iii) Given that $R = \frac{P1}{A}$ where A is cross-sectional area of the wire and P is a constant for the material of the wire, determine the constant P. (3mks)

2. You are provided with

- A glass block
- A protractor
- Four optical pins
- A plane mirror
- A meter rule
- A plain sheet of paper
- A soft board

i. Trace the outline of the glass block on the plain paper fixed on the soft board.

ii. Draw a normal at one of the longest sides as shown in figure 2 below.

iii. Draw a line making an angle $\theta = 10°$ to normal.

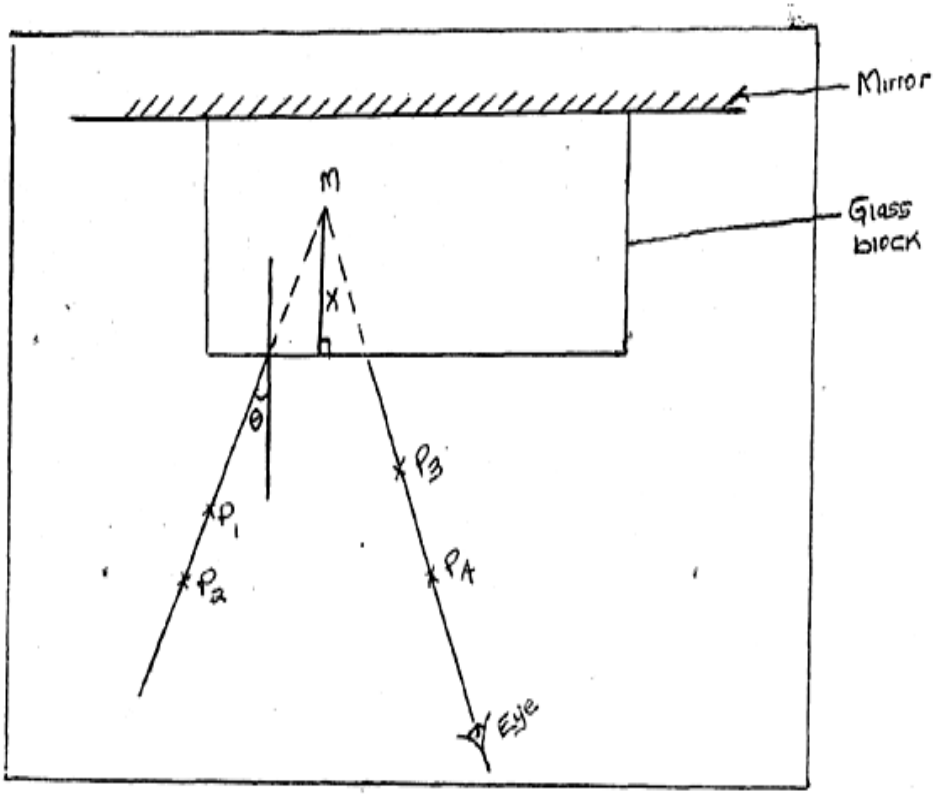


figure 2

The plain paper used must be submitted.

iv. Fix two pins P_1 and P_2 on the line

v. Fix two other pins P_3 and P_4 viewing from position of the eye such that they are in line with the images of P_1 and P_2 as seen through the glass block.

vi. Extend P_1 P_2 into the trace of the block and also P_3 P_4 into the trace to meet at a point M

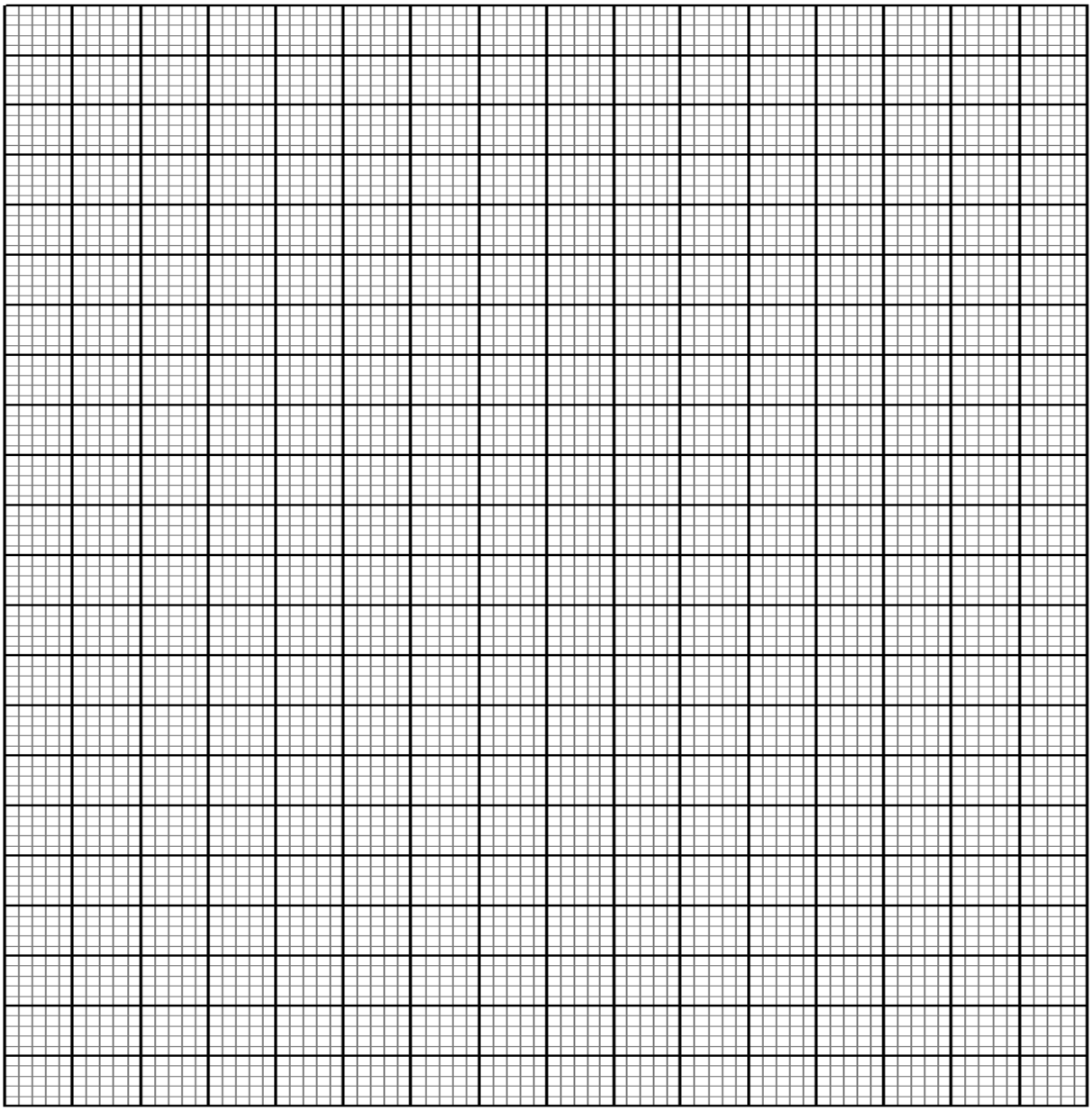
vii. Measure the perpendicular distance X

viii. Repeat the procedure for different values of θ and record your results in table 2 below

Table 2

θ (degrees)	10	15	20	25	30	35
x(cm)						

ix. Plot a graph of x (Y-axis) against angle θ (5mks)



x. Determine the maximum value of x from the graph

X max _____ (2mks)

xi. Measure the width of glass block

W = _____ (1mk)

xii. Calculate n from the formula (2mks)

$$n = \frac{W}{X \text{ max}}$$