

KCSE 2026 FINAL PREDICTION

PHYSICS

(PREDICTIONS TRIALS 1-10)

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The following are Questions to expect in KCSE 2026.

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For Marking Schemes

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KCSE 2026 FINAL BLUEPRINT!

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 1**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO THE CANDIDATES:**

- Write your **name and index number** in the spaces provided above.
- Answer **all** the questions both in section **A** and **B** in the spaces provided below each question
- All workings **must** be clearly shown; marks may be awarded for correct steps even if the answers are wrong.
- Mathematical tables and silent electronic calculators may be used.

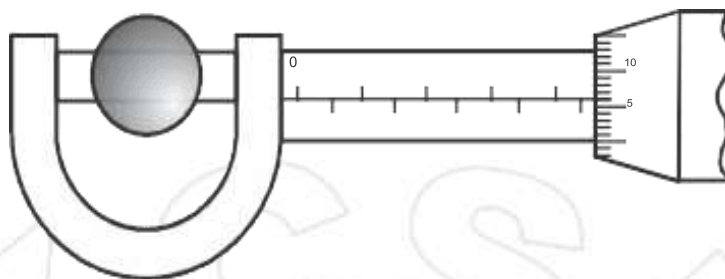
FOR EXAMINERS' USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	1 – 13	25	
B	14	09	
	15	12	
	16	10	
	17	10	
	18	07	
	Total Score	80	

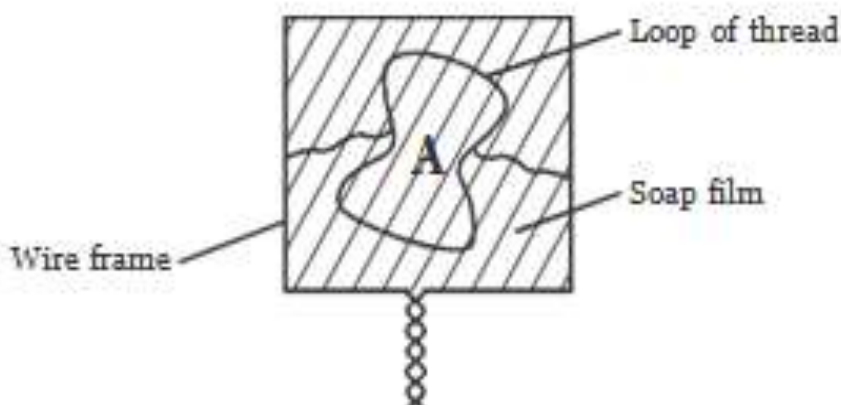
SECTION A (25 MARKS)

Answer All Questions in This Section In The Spaces Provided

1. A stopwatch started 0.36s after the start button was pressed. The time recorded using a stopwatch for an athlete running from point A to B was 12.86s. Determine the actual time taken by the athlete.
2. Fig 1.0 shows a spherical ball held between the anvil and the spindle of a micrometer screw gauge. Determine the radius of the spherical ball. Give your answer in SI units. **(2 marks)**

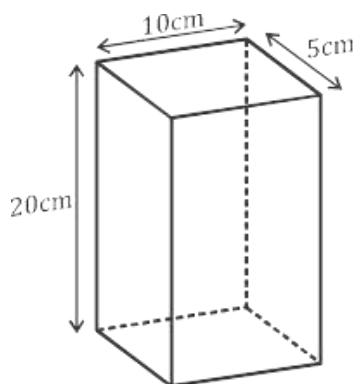


3. Figure 2.0 shows a loop of cotton thread tied onto a wire frame. The figure is dipped into a soap solution and withdrawn.



On the space left below, Illustrate and explain what happens to the shape of the loop of thread when part A is broken by touching it with a hot needle. **(2 marks)**

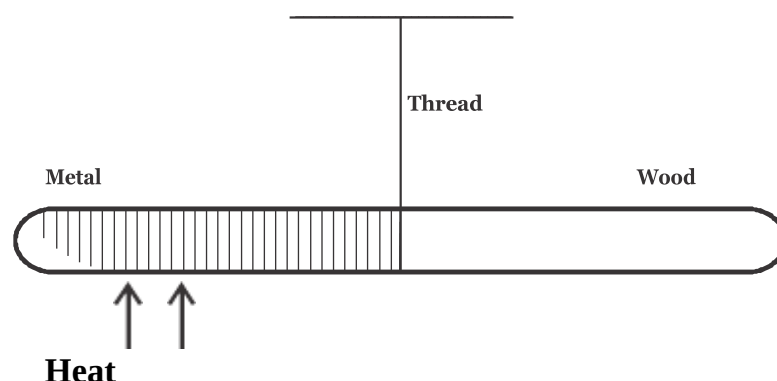
4. Figure 3.0 shows a brick of mass 8.0kg standing upright on the ground as shown.



What is the pressure it exerts on the ground ? ($g = 10 \text{ N kg}^{-1}$)

(3 marks)

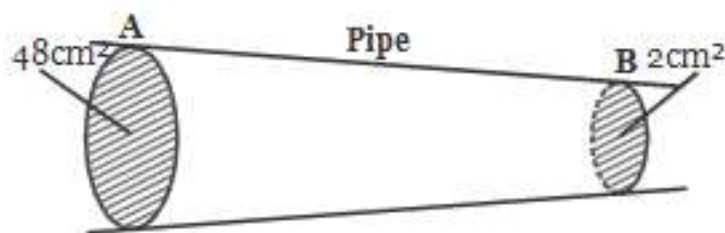
5. The figure 4.0 shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium.



The side made of metal is heated with a bunsen burner flame. State with a reason, the side to which the rod is likely to tilt (2 mks)

6. State the relationship between Physics and Mathematics.

The diagram in fig 5.0 shows a section of a pipe with different cross-sectional area



If water flows with a velocity of 10m/s in section A, what would be the velocity of water in section B ? (3 marks)

7. Determine the spring constant of a spiral spring whose length changes from 10cm to 18cm when a load of 10.0N is suspended from its lower end. (3 marks)

8. Figure 6.0 below shows a wooden sphere with a nail hammered into it as shown.

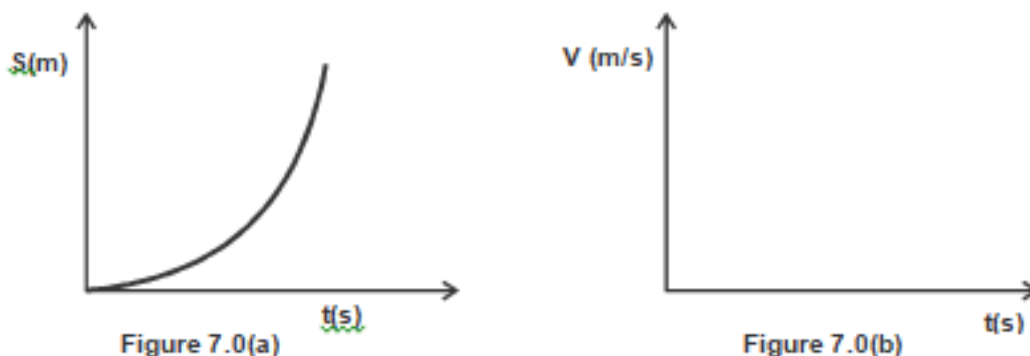


The sphere is rolled on a horizontal ground and comes to rest after sometime at point Y. Draw the sphere after it comes to rest at point Y. (1 mark)

9. When the temperature of an enclosed gas at constant pressure is raised, the volume of the gas increases. Explain how the molecules of the gas causes the increase in volume. (2 marks)

10. It is easier to stop a saloon car than a bus when both are moving with the same velocity. Explain. (2 mks)

11. Figure 7.0 (a) shows a displacement-time graph. Sketch a velocity-time graph on fig. 7.0(b)



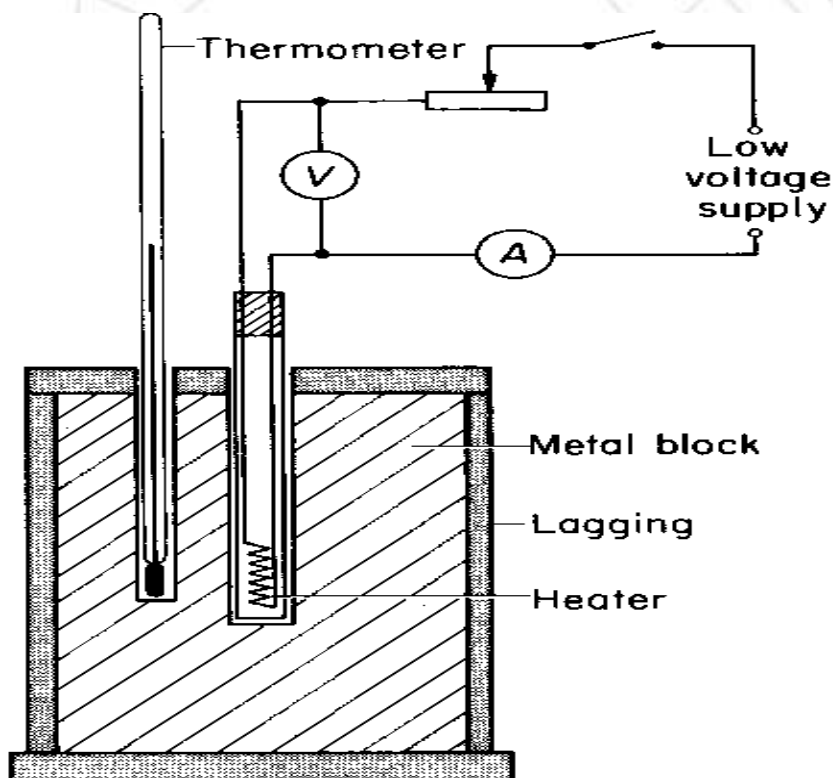
12. State the law of conservation of energy. (1 mark)

SECTION B(55 MARKS)

Answer ALL the questions in the spaces provided

- 14(a) Define specific heat capacity (1 mark)

- b) The figure below shows apparatus that a student uses to make an estimate of specific heat capacity of iron. The power of the heater is known



- State four readings the student must take to find the specific heat capacity of iron. (2 marks)
- How could you use the measurements above to find the specific heat capacity of iron. (2 marks)
- Explain why the value obtained above with this apparatus is higher than the actual value. (1 mark)
- State one addition to the apparatus that would help improve the accuracy of the value obtained. (1 mark)

c) 20g of a certain fuel produces 3.5×10^7 J/kg of heat when burnt in a plentiful supply of oxygen.

This mass of fuel was burnt and the heat obtained was used without loss to heat 400g of a liquid originally at 10°C . After all the heat has been absorbed by the liquid, 140g of it remained as a liquid. The specific heat capacity of the liquid was 2.5×10^3 J/KgK and its boiling point was 80°C . Calculate the specific latent heat of vapourization of the liquid. (ignoring heat losses, the thermal capacity of the container and any liquid evaporated before reaching boiling point). **(4 marks)**

15(a) Define the term velocity ratio **(1 mark)**

b) Draw a labeled diagram of a block and tackle system which has a velocity ratio of 7. **(2 marks)**

b) This pulley system has an efficiency of 70%. Calculate.

i) Its mechanical advantage **(2 marks)**

ii) Effort required to raise a load of 122N **(2 marks)**

iii) The work done by a man using this machine in raising the load through a vertical distance of 3.0m. **(3 marks)**

iv) The time taken to do this if his average rate of working is 150W. **(2 marks)**

16(a)i) State Archimedes principle (1 mark)

ii) Explain one application of Archimedes principle in real life **(2 marks)**

b) The mass of the fabric of a large balloon is 700kg. The balloon is inflated with 2000m^3 of helium.

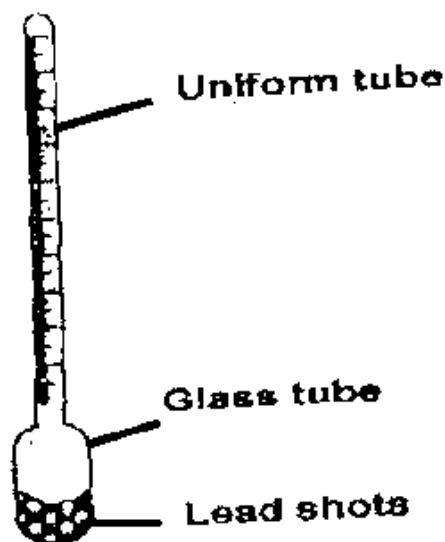
The balloon is attached to a cable fixed to the ground and released to still air (density of air and helium are 1.25kg/m^3 and 0.18kg/m^3 respectively)

i) Draw the forces acting on it **(2 marks)**

ii) Determine the tension in the cable **(3 marks)**

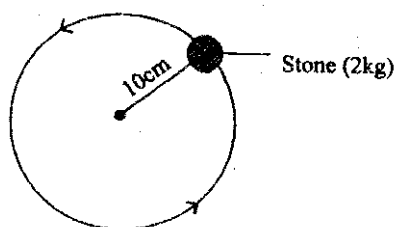
iii) What would be the acceleration of the balloon if the cable is cut? **(3 marks)**

c) The figure below shows a simple hydrometer



i) State the purpose of the lead shots in the glass bulb **(1 mark)**

- ii) How would the hydrometer be made more sensitive (1 mark)
- iii) Describe how the stem is calibrated to measure relative density (2 marks)
- 17(a)** Define centripetal force (1 mark)
- b) The figure below shows a stone moving with uniform speed in a horizontal circle
- Indicate on the figure the centripetal force(T) (1 mark)



- c) If the stone takes 15 seconds to describe an arc length of 5cm. Calculate
- i) The angle it subtends at the centre (2 marks)
- ii) The angular velocity ω (2marks)
- (v).Linear velocity V of the stone (2 marks)
- iv) The centripetal force (T) (2 marks)
- 18.**A block of mass 200g rests on a rough a horizontal table. A force of 0.6N pulls the block so that it moves with a constant acceleration of 1m/s^2 calculate
- i) The time it takes to travel a distance of 200m (2 marks)
- ii) the frictional force between the block and the table (2marks)
- iii) The coefficient of kinetic friction between the two forces (2marks)
- iv) Apart from the normal reaction and frictional force , name other force (1mark)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 1**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***Instructions to candidates**

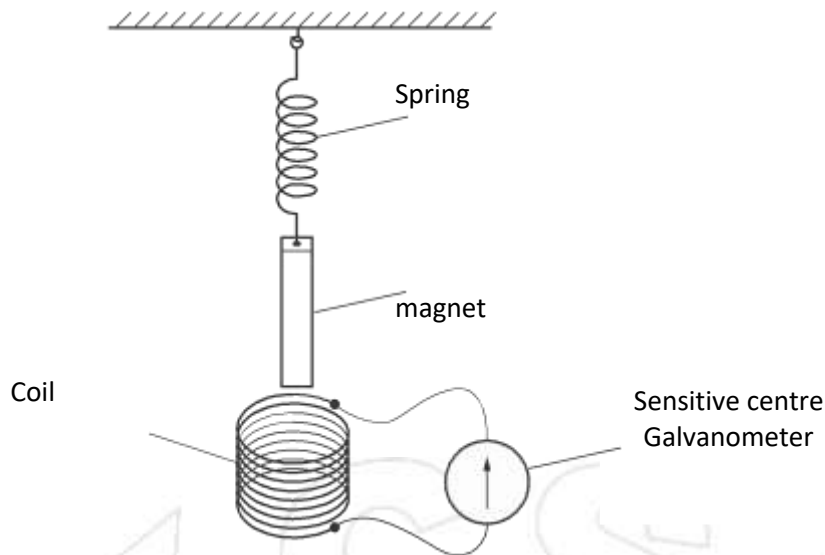
- (a) Write your name, index number in the spaces provided above.
- (b) Sign and write the date of the examination in the spaces provided
- (c) This paper consists of **TWO** Sections: **A** and **B**.
- (d) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- (f) KNEC mathematical tables and silent non-programmable electronic calculators may be used.

FOR EXAMINER'S USE ONLY:

Section	Question	Maximum Score	Candidate's Score
A	1 – 13	25	
	14	07	
	15	12	
B	16	12	
	17	13	
	18	11	
Total Score		80	

SECTION A (25 MARKS)

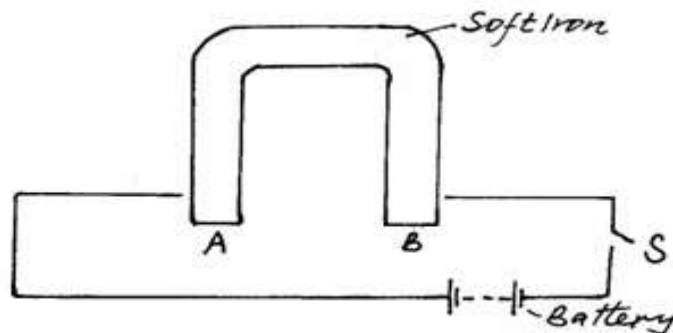
1. The figure below shows a magnet suspended above a coil of wire.



The end of the magnet is pushed into the coil and released, so that it bounces repeatedly in and out of the coil. Describe what is seen on the sensitive centre-zero galvanometer (2 mks)

2. State two advantages and one disadvantage of a convex mirror when used as a driving mirror (2mks)

3. The figure below shows an incomplete circuit of an electromagnet.



Complete the circuit by drawing the windings on the two arms of the core so that A and B are both north poles when the switch S is closed. Indicate the direction of the current of the windings drawn. (1 mark)

4. The plates A and B of a parallel capacitor shown in the figure (i) below were first charged and then placed parallel to each other and at distance d.

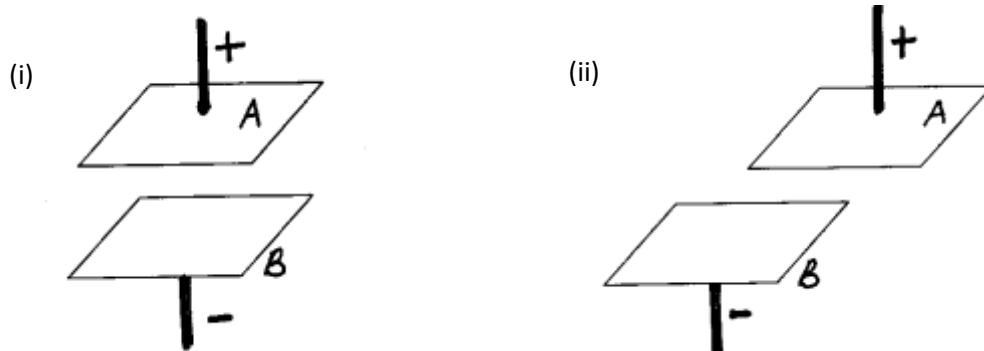


Plate A is moved slightly to the right, figure (ii). State with a reason what effect this change will have on the capacitance of the capacitor. (2 marks)

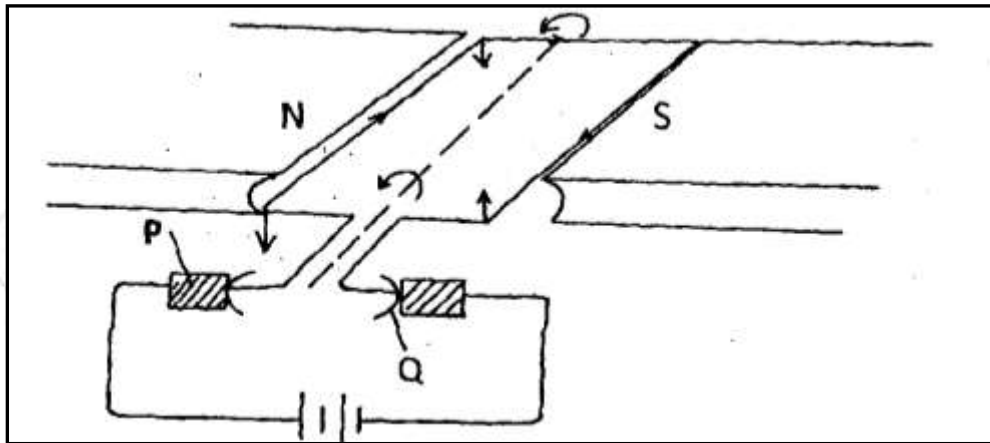
5. The chart below shows an arrangement of different parts of electromagnetic spectrum:

Radio	Infra-red	Visible	A	X-Rays	Gamma Rays

Name the radiation represented by A.

(1mark)

6. The figure below shows a simple d.c. motor;



(i) Name the parts labeled **P** and **Q**

P

(1mark)

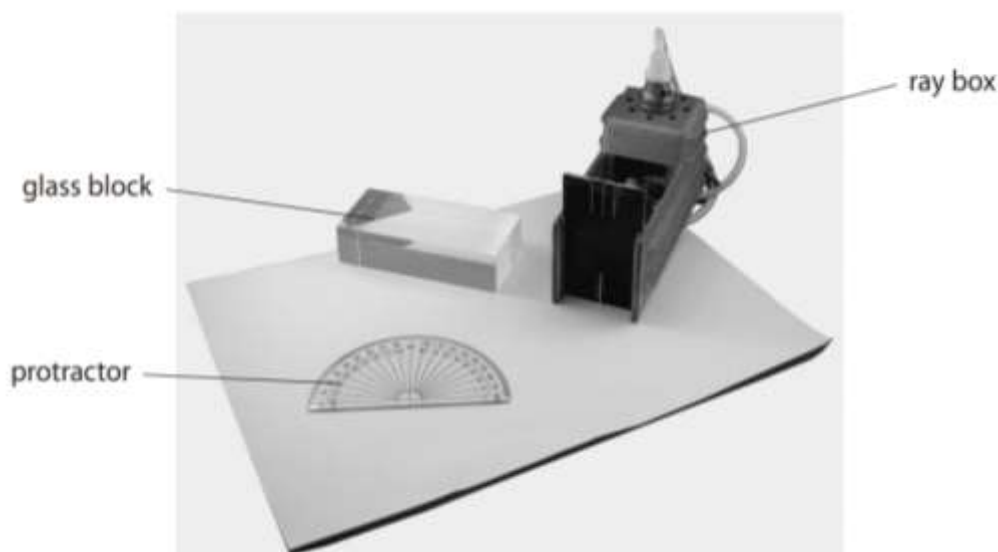
Q.....

(1mark)

(ii) Explain why the pole pieces are curved

(1mark)

7. The student wants to find the refractive index of the glass. The photograph shows the apparatus the student has available.



Describe how the student should carry out the experiment.

(4 mks)

You should include:

- what the student should measure
- how the measurements should be made
- how the student should use a graph to find the refractive index

8. James rubbed a glass rod with a cloth to give it a positive charge. His effort to charge an aluminum rod using the same method didn't work out. Explain this observation

(1mark)

9. A student set-up the two circuits in fig. A and fig B as shown below. If the bulbs and cells were identical, state with a reason which bulb will be brighter.

(2 marks)

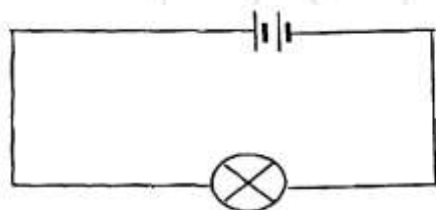


Fig a

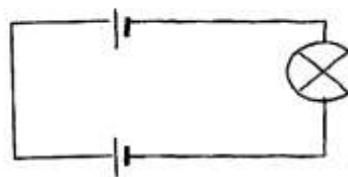
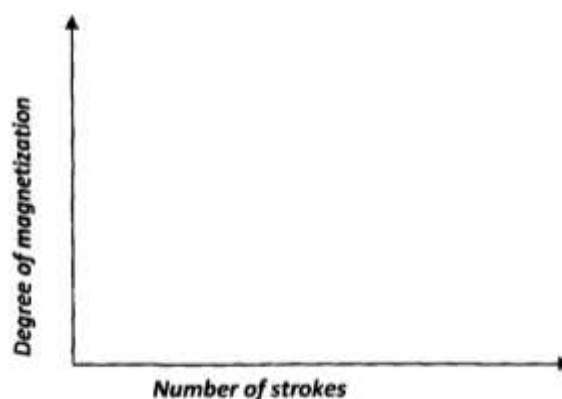


Fig b

10. An iron rod placed on a bench is stroked several times using one pole of a bar magnet. Sketch a graph showing the degree of magnetization against the number of strokes on the axes below.

(2mks)



- 11.State one similarity between the human eye and the lens camera. (1 mark)
- 12.A soldier standing at some distance from a wall blows a whistle and hears its echo 1.8 seconds later.
How far is the soldier from the wall? (speed of sound in air is 330ms^{-1}) (3marks)
- 13.Distinguish between transverse and longitudinal waves. (1mark)

Section B (55 marks)

Answer all questions in this section and on the spaces provided

- 14.Figure 7 is a diagram of cathode ray tube. M and N are parallel vertical plates.

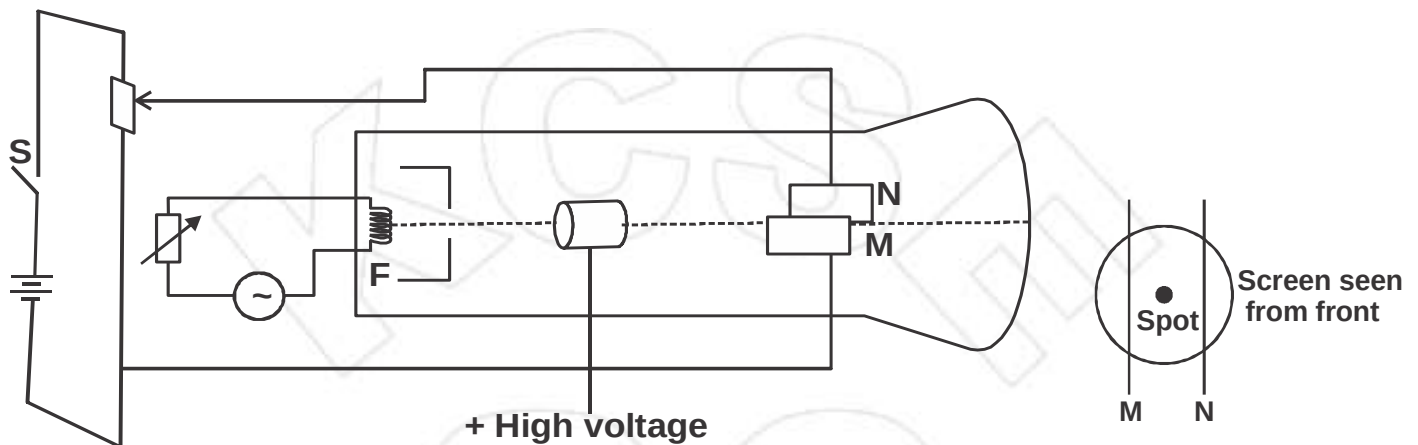
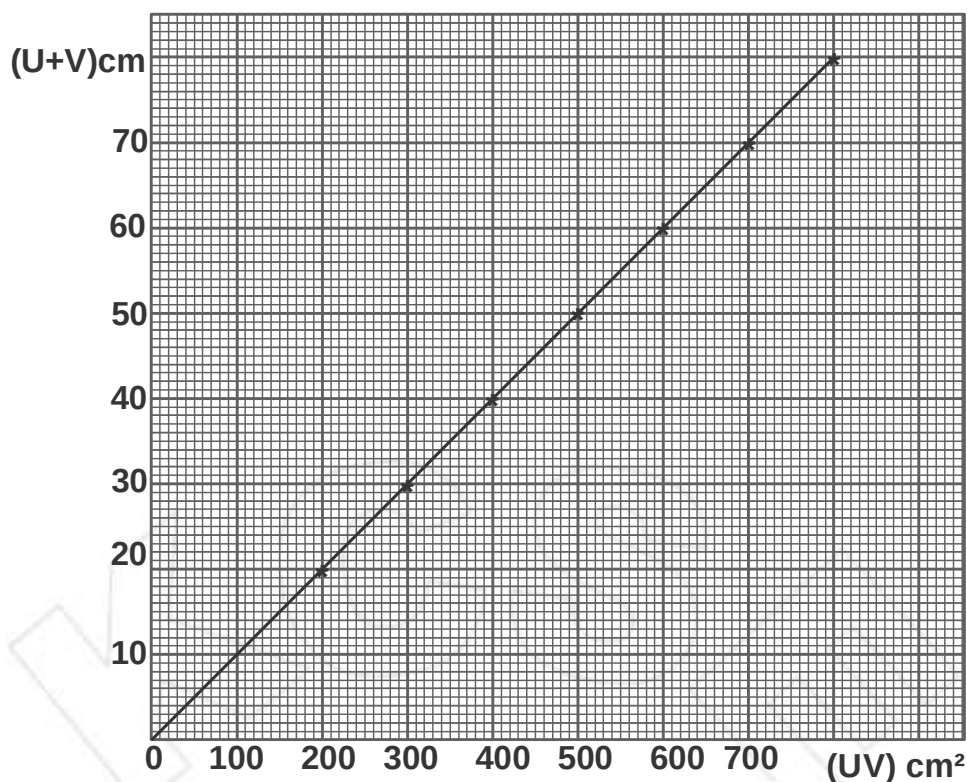


Figure 7(a)

Figure 97b)

- a) When switch S is open, spot is seen at the centre of the screen as shown in figure 9.
- i) State what happens to the spot when S is closed. (1 mark)
- ii) State what would happen to the spot if the potential difference across MN is increased.(1 mrk)
- iii) State what would be seen on the screen if the battery is replaced with an alternating e.m.f of;
- I) a low frequency of about 1HZ (1 mark)
- II) a high frequency of about 50HZ. (1 mark)
- b) Explain the process by which electron are produced at F. (2 marks)
- c) State with a reason how the brightness of the spot can be increased. (2 marks)
- d) The accelerating voltage of the tube is 1000V and the electron current in the beam is 1.5mA.
Determine the energy to the screen per second. (3 marks)
15. a)State two differences between the image formed when the object is between C and F and the one formed when the object between F and P by a concave mirror. (2 marks)
- b)An object is placed 60cm from of a concave lens of focal length 40cm. Determine the position of the image. (3 marks)

c) Figure 8 shows a graph drawn from experimental data to determine the focal length of a convex lens.



i) Determine the slope of the graph.

(3 marks)

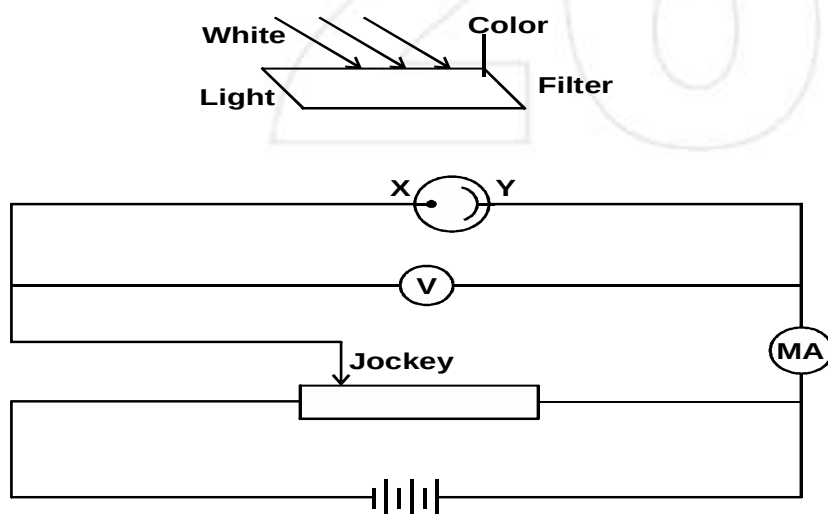
ii) Determine the focal length of the lens.

(3 marks)

16.a) What is meant by the term photoelectric effect.

(1 mark)

b) The figure below shows an arrangement used to investigate photoelectric effect.



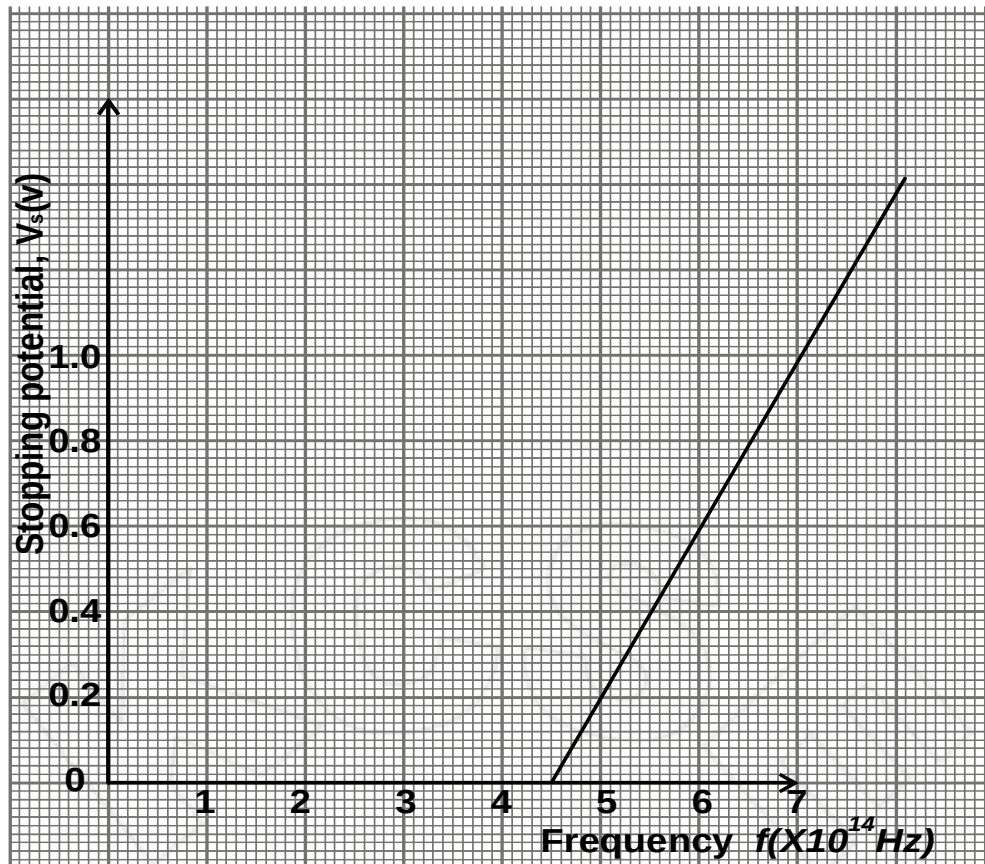
i) Name the parts X and Y

(2 marks)

ii) State how the intensity of light affects the photo current.

(2 mark)

c) The result obtained from experiment with different colours are shown graphically below.



From the graph determine;

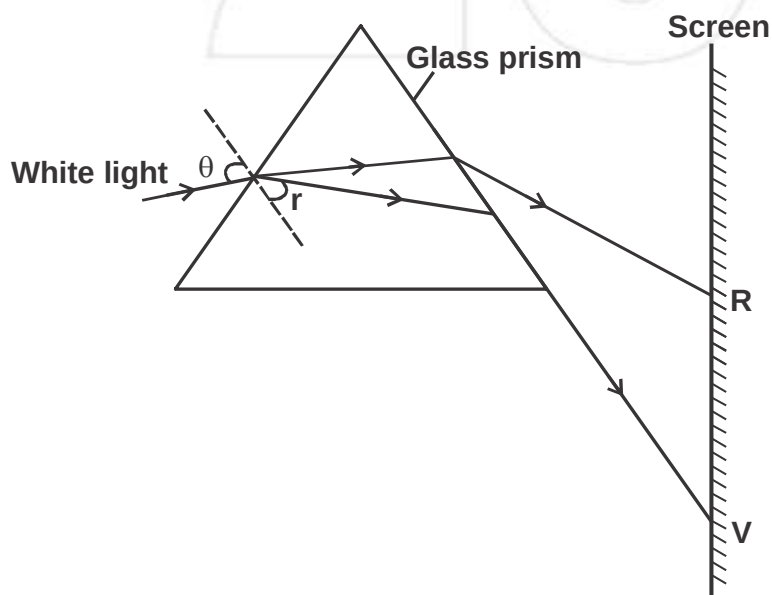
i) Threshold frequency.

(2 marks)

ii) The work function of the metal

(3 marks)

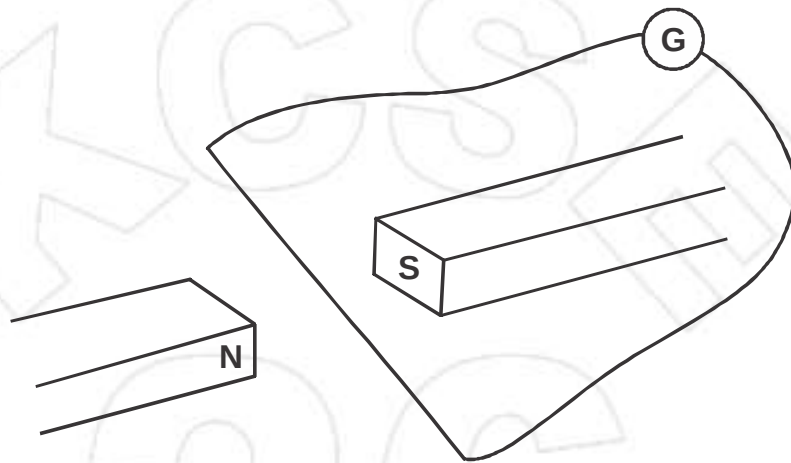
17.. The figure below shows a ray of white light dispersed in a triangular prism. The speed of violet light in the prism is 1.88×10^8 m/s.



- a) Explain how glass disperses white light into red and violet bands. (2 mark)
- b) Determine the refractive index of the prism material for violet light. (Take speed of violet light in vacuum = $3.0 \times 10^8 \text{ m/s}$) (3 marks)
- c) Show on the figure the critical angle, c , for violet light and determine its value. (3 marks)
- d) Given that $r = 21.5^\circ$ determine the angle θ . (3 marks)
- e) On the same figure, sketch the part of red light after white light strikes the prism if the prism was replaced by another of similar shape but lower refractive index. (use dotted line for the answer) (2 marks)

18. a) State Lenz's law of electromagnetic induction. (1 mark)

- b) A wire placed between the poles of two permanent magnets is connected as shown in figure 10.



- i) State and explain what is observed when the wire is moved up and down. (2 marks)
- ii) Suggest two ways of altering the magnitude of the effect you have stated in (i) above. (2 marks)
- c) Explain why the core of a transformer is :
- i) laminated (1 mark)
- ii) Made of soft iron (1 mark)
- d) A heater rated 3KW is used for 30 minutes every day for 30 days. Calculate the cost of the electricity consumed in the 30 days given that it is charged at Ksh.7.00 per unit. (3 marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 2**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***Instructions to candidates**

1. Write your name, index number and school in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
3. This paper consist of **TWO** sections; **A** and **B**.
4. Answer **ALL** the questions in section **A** and **B** in the spaces provided.
5. **ALL** working **MUST** be clearly shown.

FOR EXAMINERS USE ONLY

MAXIMUM SCORE	80 MARKS
CANDIDATE'S SCORE	

SECTION A: 25marks

1. A stopwatch is used to time a runner in a race. Figure below show the stopwatch at the start and at the end of a lap of the race.



start of lap



end of lap

State how long(in SI unit) did the runner took to finish the lap of the race (1mark)

2. The front views of two cars are shown in figure below, drawn to the same scale.



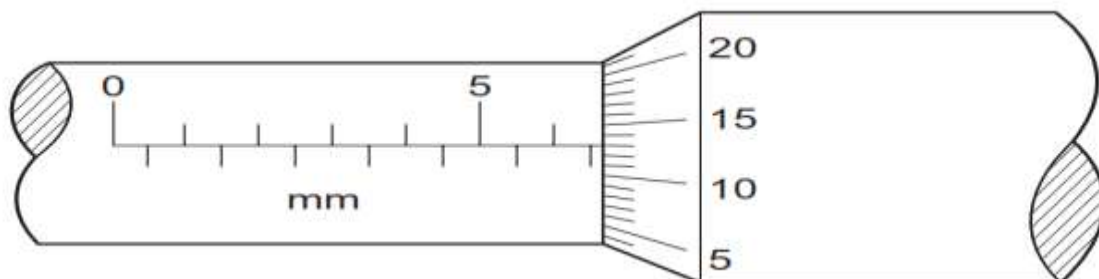
family car



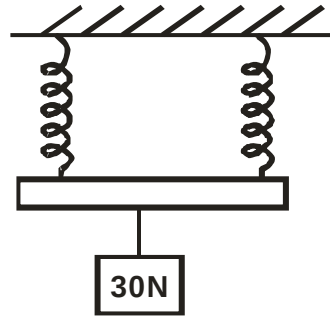
racing car

Suggest which car has the greater stability, and give a reason. (2marks)

3. Figure below shows a micrometer screw gauge. State the reading indicated (2marks)



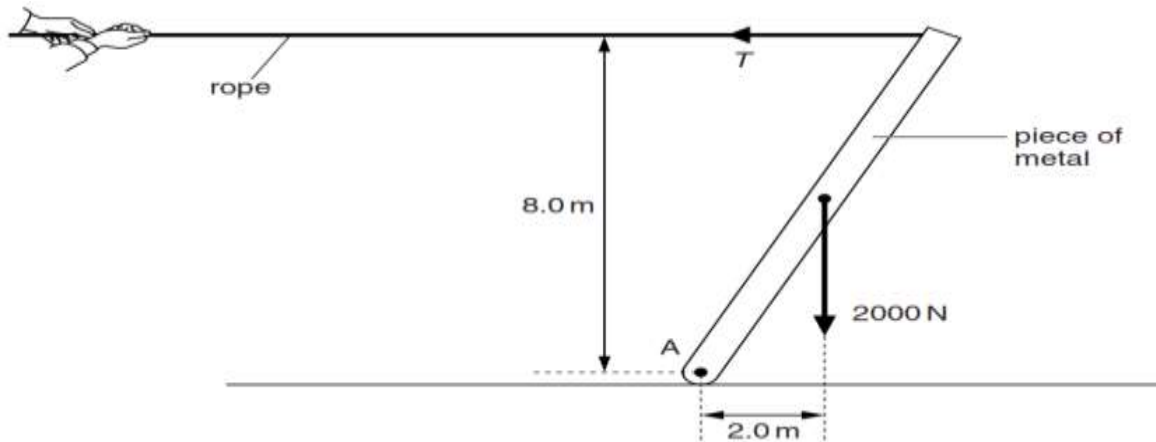
4. Figure 4 shows two identical springs of spring constant 3N/cm supporting a load of 30N .



Determine the extension of each spring.

(2 marks)

5. Figure below shows a system for raising a heavy piece of metal into a vertical position.



A man pulls on the rope with a horizontal force T . The piece of metal has a weight of 2000 N and is freely pivoted at A . The system is in equilibrium. By taking moments about A , calculate T .

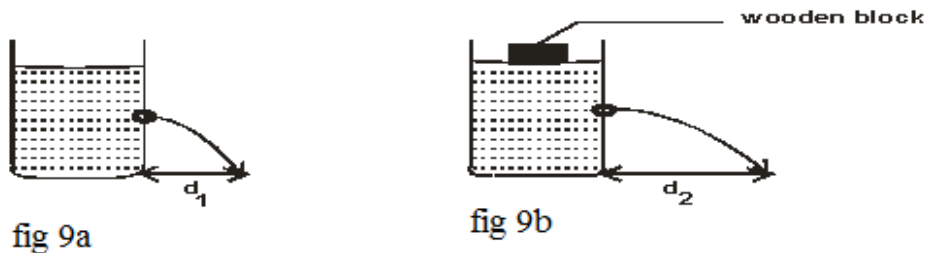
(3marks)

6. Explain why an aeroplane is likely to take off much earlier than expected when the speed of the wind blowing in the opposite direction to its motion on the runway suddenly increases. (2 mks)
7. An aircraft 300m from the ground traveling horizontally at 400m/s releases a parcel. Calculate the horizontal distance covered by the parcel from the point of release. (Ignore air resistance) (3 marks).
8. A body of mass 4.0kg held at a vertical height of 500cm is released to travel along a frictionless curved path as shown below.



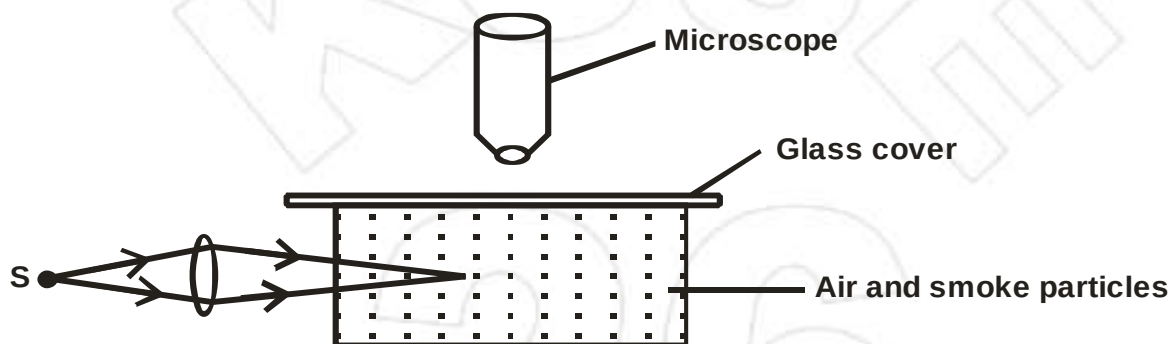
The 4.0kg mass strikes another body of mass 6.0kg at rest immediately it reaches the horizontal the bodies stick together and move in the same direction. Determine the velocity of the bodies immediately after collision. **(3marks)**

9. A tin with a hole is filled with water to a certain height. Water jets out as shown in figure 9(a) below. A second identical tin is filled with water to the same height and a block of wood floated as shown in figure 9(b).



State the reason why the maximum distance of jet d_2 is greater than d_1 . **(1 mark)**

10. The figure 2 below shows the apparatus used to observe Brownian motion using a smoke cell.

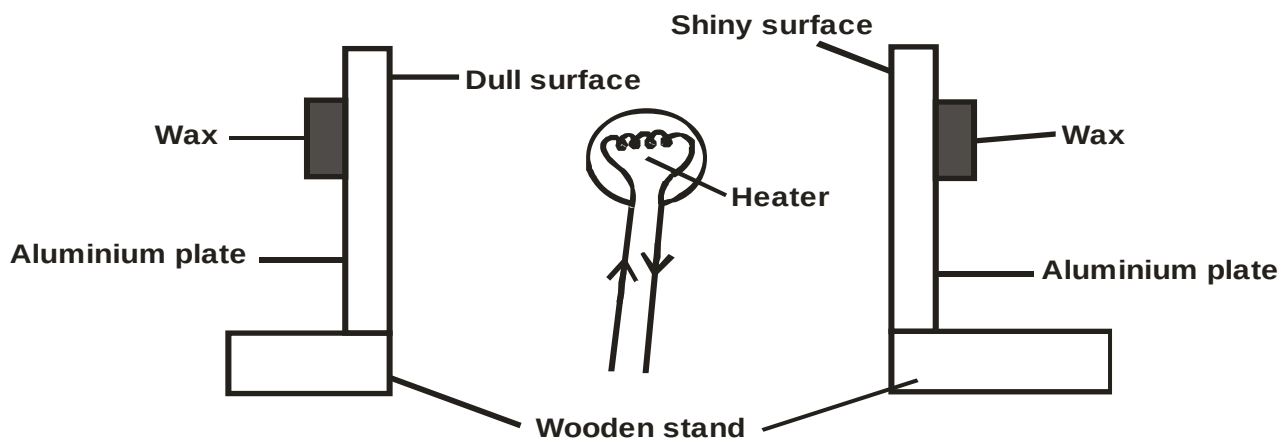


i) State the observation made in the smoke cell. **(1 mark)**

ii) Explain the observation made when the temperature in the smoke cell is increased. **(1 mark)**

11. When a mercury in a glass thermometer is used to measure the temperature of hot water, it is observed that the mercury level first drops before beginning to rise. Explain. **(2 marks)**

12. Figure 3 shows an arrangement of apparatus to study properties of different surfaces.

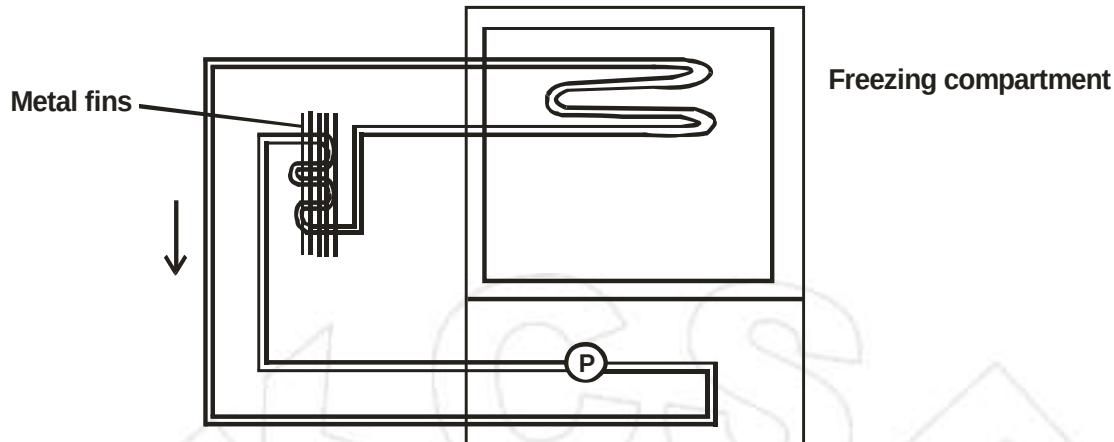


The heater is placed equidistance from the two plates. State what happens when the heater is switched on for some time. (1 mark)

13. Explain your answer in question 12 above (1mark)

SECTION B: 55marks

14. a) The figure below shows the features of a refrigerator.



i) What is the function of the pump? (1 mark)

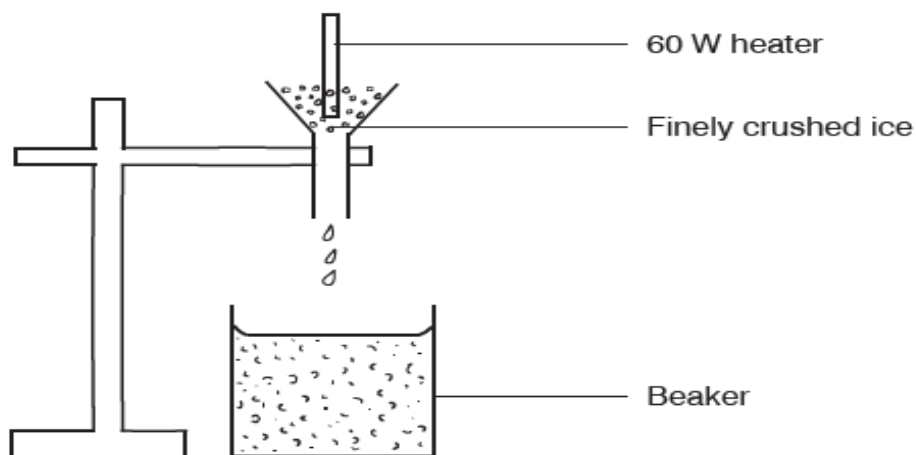
ii) What is the function of the copper fins at the back of the refrigerator? (1 mark)

iii) Explain briefly how cooling takes place in the refrigerator. (3 marks)

iv) What is the purpose of the double wall in a refrigerator? (1 mark)

b) i) Define the term latent heat of fusion of a substance. (1 mark)

ii) The figure below shows an apparatus that could be used to determine the specific latent heat of fusion of ice.



In order to obtain results that are as accurate as possible, state why it is important to:

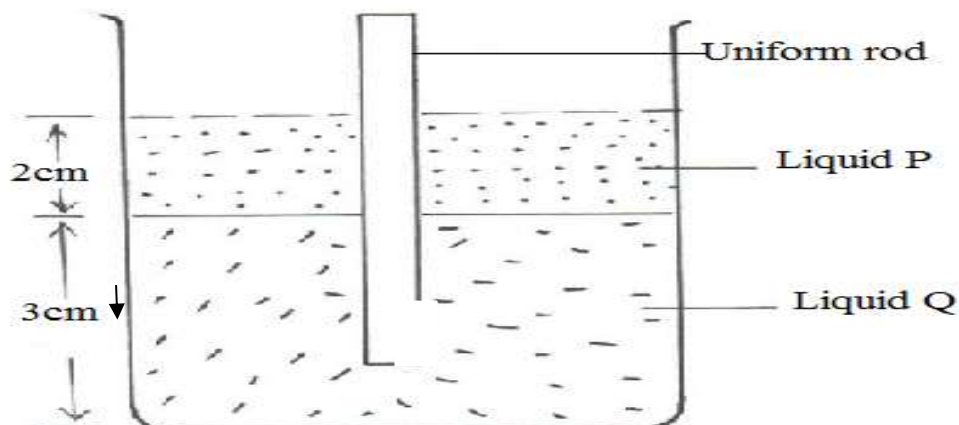
I. wait until water is dripping into the beaker at constant rate before taking readings. (1 mark)

II. Use finely crushed ice rather than larger ones. (1 mark)

15. (a) State the law of flotation.

(1 mark)

(b) Figure below shows a uniform rod of height 8cm floating vertically in a beaker containing two immiscible liquids P and Q. The densities of the liquids are 800kg/m^3 and 1200kg/m^3 respectively the cross-sectional area of the rod is 2cm^2 .



Determine

(i).the weight of liquid P displaced by the rod.

(3 marks)

(ii) The weight of liquid Q displaced by the rod.

(2 marks)

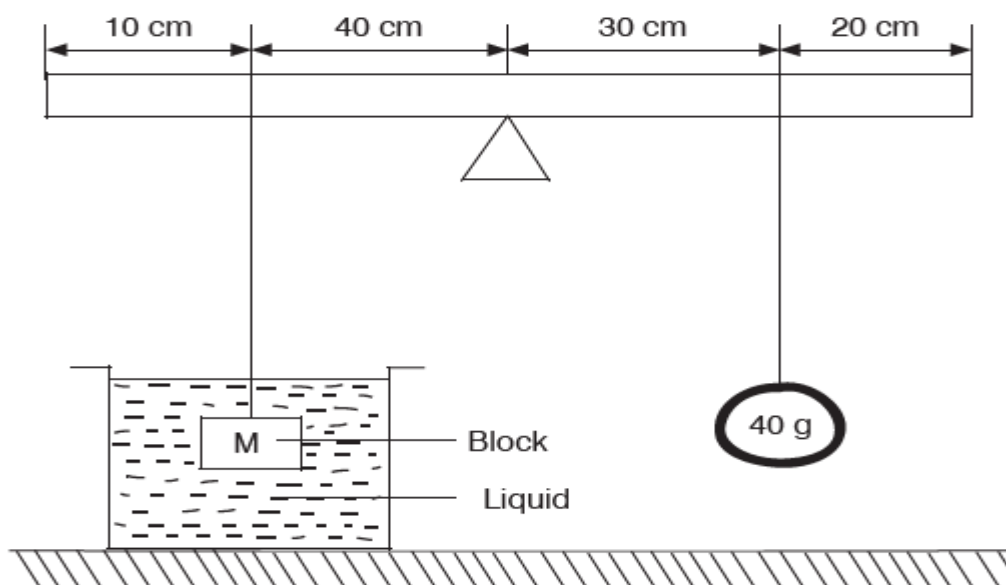
(iii) The mass of the rod.

(1 mark)

(iv)The density of the rod.

(2 marks)

(c). Figure below shows a block of volume 50 cm^3 and density $2\,000\text{ kg/m}^3$ submerged in a liquid and suspended from a uniform horizontal beam by means of a thread. The beam is balanced by a spherical mass of 40 g, which is suspended from it on the other side of the pivot as shown

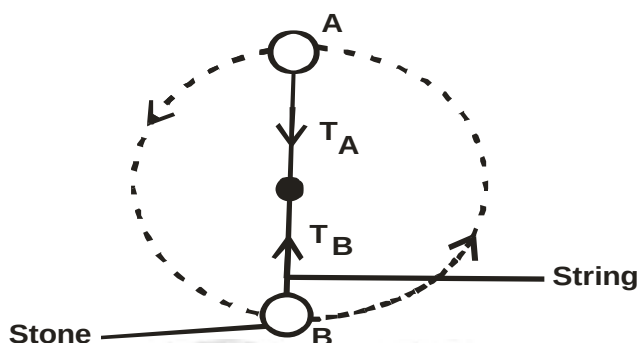


Determine the upthrust force acting on the block.

(3 marks)

16. a) State two condition necessary for a driver to negotiate a bend on a banked bend at a relatively high speed (2 marks)

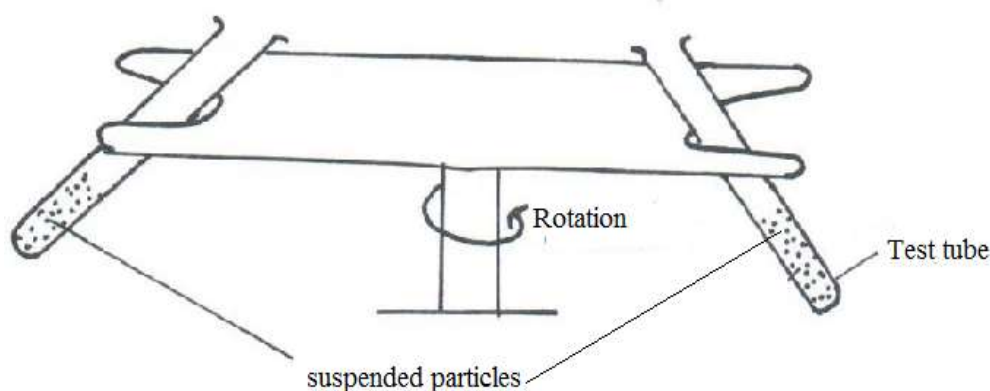
(b). The figure shows stone of mass 100g whirled in a vertical circle using a thread of length 56cm. (Take $g = 10 \text{ N/Kg}$)



If the stone is whirled at a speed of 8 m/s . Calculate;

- i)** The centripetal force experienced by the stone. (3 marks)
- ii)** Tension force on the string:
 - I)** T_A (2 marks)
 - II)** T_B (2 marks)
- iii)** calculate the angular velocity of the stone. (1 mark)

(d) Figure shows a centrifuge that is used to separate particles suspended in a liquid.



Particle of different mass M_1 , M_2 and M_3 are suspended in a liquid which they do not dissolve. The system is then rotated in the direction shown.

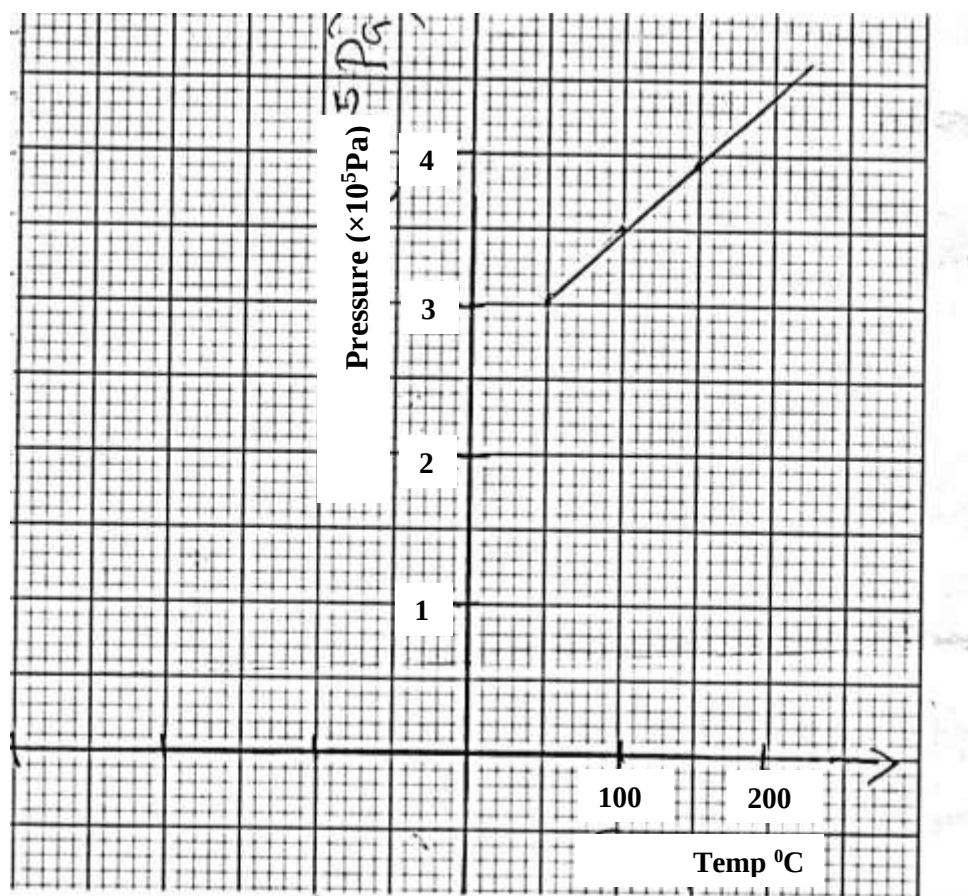
(i). Explain why the particles of different masses will acquire different radii as the system is rotated. (1 mark)

(ii). If $M_3 > M_2 > M_1$, arrange the particle in increasing radii when the centrifuge is rotated for some time. (1 mark)

17.a) State the one condition necessary for pressure law to hold. (1 mark)

b) A bubble at the bottom of a pond expands as it rises to the top of the liquid. Explain. (1 mark)

c) The graph below represents a graph of pressure against temperature, °C.



From the graph, determine;

i) The absolute temperature.

(1 mark)

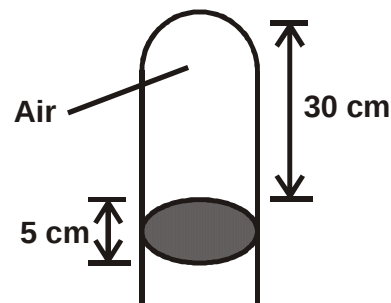
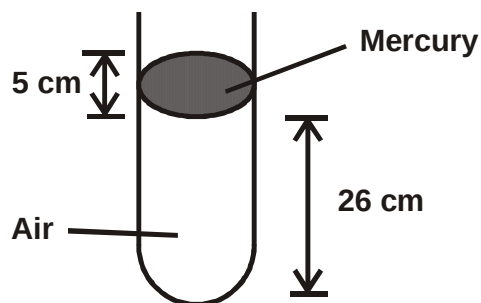
ii) The pressure at 373K

(1 mark)

Explain why temperature in (i) above can not be achieved

(2 marks)

d) A column of air 26cm long is trapped by mercury thread 5cm long. When the tube is inverted, the air column becomes 30cm long. What is the value of atmospheric pressure? (3 marks)



Explain using kinetic theory of gases why pressure of gases increases as temperature of the gas is increased.

(3 marks)

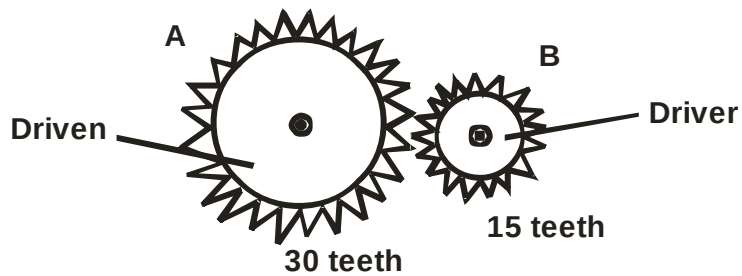
18. a) Differentiate between work and energy.

(2 marks)

b) Describe the energy transformation that takes place when a car battery is used to light a bulb.

(1 mark)

c) The figure shows a machine.



Gear wheel A with 30 teeth is driven by gear wheel B with 15 teeth.

i) Determine the velocity ratio of the machine.

(2 marks)

ii) If the machine has a mechanical advantage of 0.375, determine the efficiency of the machine.

(2 marks)

d) A cart of mass 30kg is pushed along horizontal path by a horizontal force of 8N and moves with a constant velocity. The force is then increased to 14N.

Determine;;

i) The resistance to the motion of the cart.

(1 mark)

ii) The acceleration of the cart.

(2 marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 2**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- (a) Write your name and index number in the spaces provided.
 (b) Mathematical tables and non-programmable calculators may be used.
 (c) This paper consists of section A and section B.
 (d) Attempt all the questions in the spaces provided.
 (e) ALL working MUST be clearly shown.

FOR EXAMINERS USE

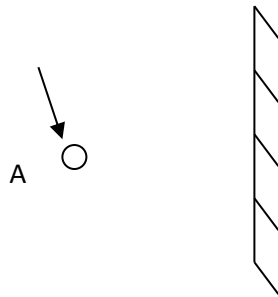
SECTION	QUESTIONS	MAX SCORE	CANDIDATE'S SCORE
A	1 – 12	25	
B	13	13	
	14	15	
	15	15	
	16	12	
	TOTAL	80	

SECTION A (25 MARKS)

1. An object pin is placed in front of a plane mirror. The image of the pin is viewed from position

A. Draw array diagram to show this image.

(2 marks)



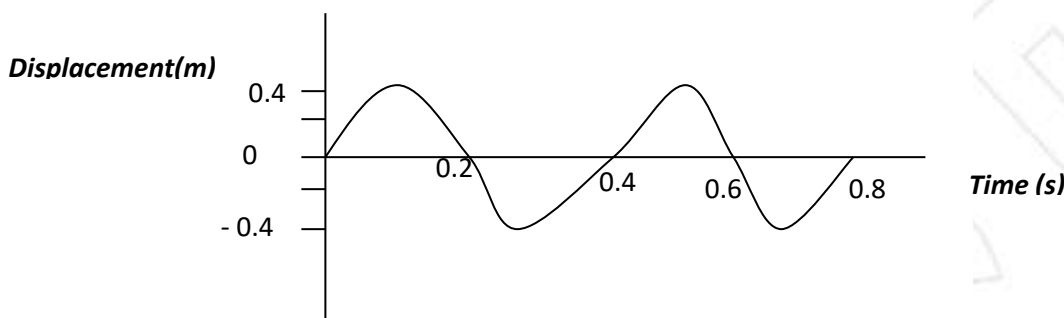
2. You are provided with two rods, a conductor and an insulator. Describe how you would use a charged gold-leaf electroscope to distinguish between the insulator and a conductor. **(2 marks)**

3. A pin-hole camera of length 10 cm is placed 0.5 m away from a goalpost. A sharp image of the goalpost 15 cm high is formed on the screen.

Determine the height of the goalpost.

(2 marks)

4. The figure 2 below shows a displacement- time graph of a particular progressive wave.



Draw on the same diagram, a wave which passes through the points with double frequency and half amplitude of the first wave.

(2 marks)

5. Explain how temperature affects the speed of sound in gases

(1 mark)

6. A polythene charged strip is brought near two spheres A and B that are in contact as shown in



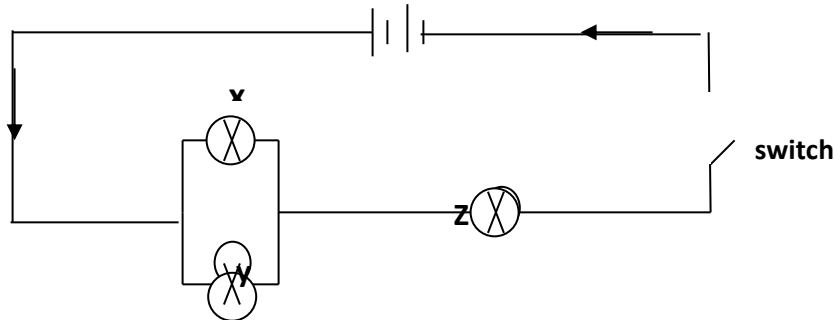
(i) indicate the charge distribution on the spheres when negatively charged polythene is brought near

A.

(1 mark)

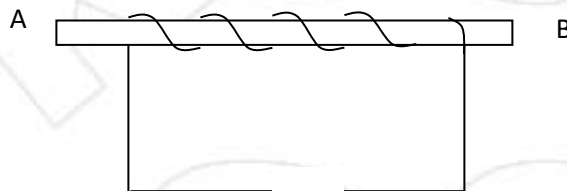
- (ii) draw the charge distribution on A and B shown in (b) when the spheres are separated and immediately polythene withdrawn. (2 marks)

7. Three identical lamps X, Y, Z are connected as in figure 4. The E.m.f applied in the circuit 3.0 volts



- (i) State which lamp is brightest when circuit is closed? (1 mark)
 (ii) Explain your answer in part (i) above. (2marks)

8. Figure 5 shows an iron rod on which a wire is to be wound to make an electromagnet.

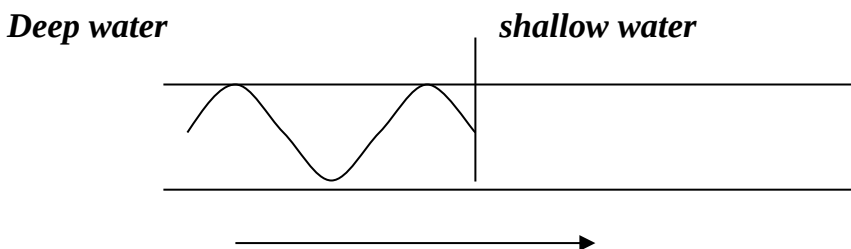


By drawing, show how two cells are connected so that end A becomes North pole and end B south pole. (2marks)

9. The force on a conductor carrying current in a magnetic field can be varied by changing, among others, the magnitude of the current and magnetic field strength. State two other factors that can be changed to vary the force. (2marks)

10. Using domain theory explain the differences between a magnetic material and a magnet (2mks)

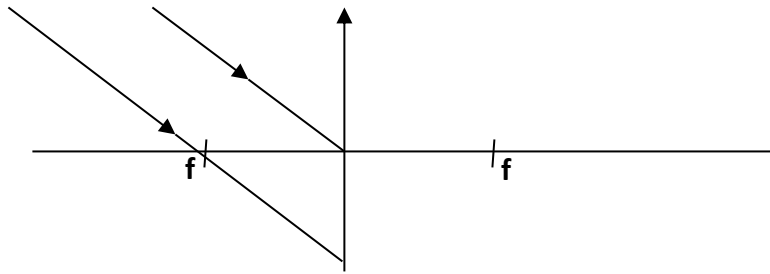
11. Figure 6 shows water waves traveling from deep into shallow water.



Complete the wave front to show how it travels in shallow water

(1 mark)

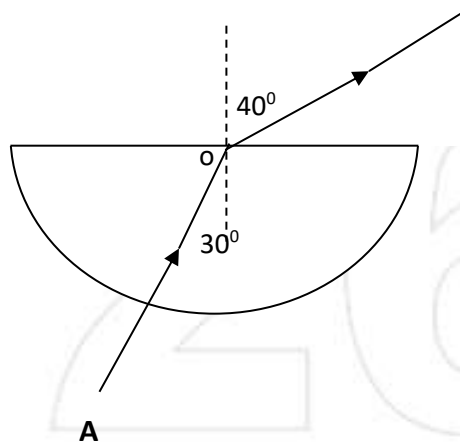
12. Figure 7. Shows two rays incident on a converging lens



- (i) Draw the ray after refraction to show positions of the image. (2marks/)
- (ii) State the application of this arrangement in (i) above (1 mk).

SECTION B(55 MARKS)

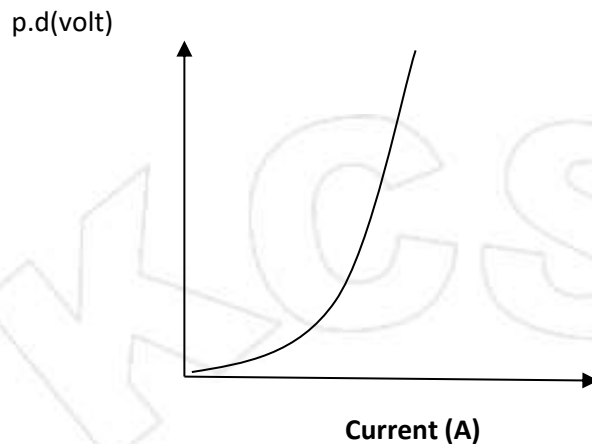
13. (a) Define refractive index of a material in terms of velocity of light. (1mark/)
- (b) state the conditions necessary for a total internal refraction to occur (2marks)
- (c)Figure 8 shows light ray traveling from air to glass and from glass to air. Ray of Light AO is incident normally on the semicircular glass



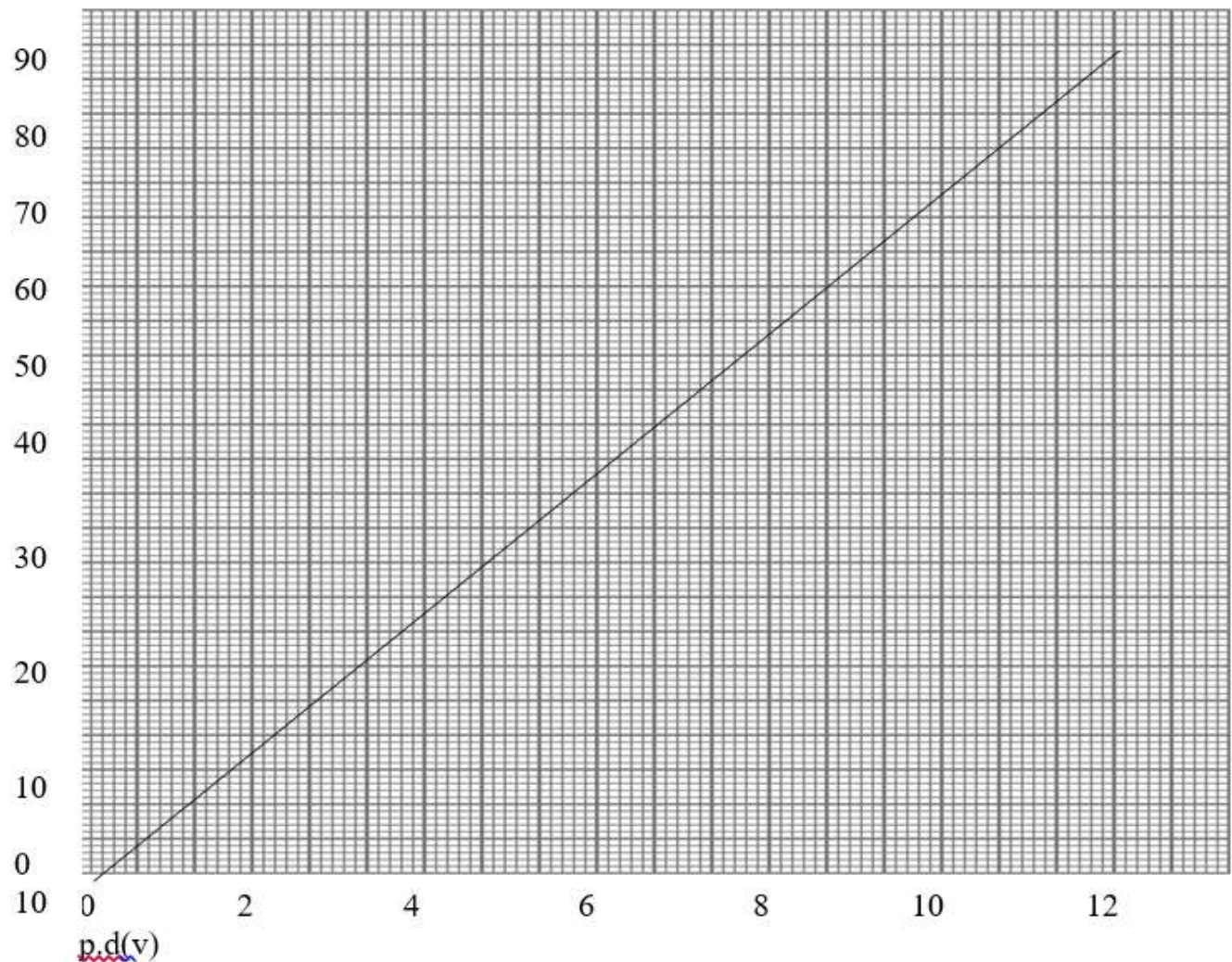
- (i) Determine the refractive index of glass with respect to air. (3 marks)
- (ii) In addition to the circular glass, you are provided with; a ray box (source of light ray), four office pins, soft board, white paper and a protractor, describe how this apparatus may be used to determine the critical angle of the glass. (4marks)
- (iii) Determine the critical angle of this semicircular glass. (3 marks)

14.(a)You are provided with three resistors $1\ \Omega$, $3\ \Omega$ and $6\ \Omega$.

- (i) Draw a circuit diagram to show 6Ω and 3Ω resistors in parallel and this combination in series with 2Ω resistor and the 6 V battery. **(2marks).**
- (ii) Determine the total effective resistance in the circuit drawn in (i) above **(2 marks)**
- (iii) Calculate the p.d across a 2Ω resistor **(2 marks)**
- (iv) Determine the value of current through the 6Ω resistor **(3marks)**
- (b) Figure 9, shows a graph of potential difference (V) against current (I A) through a filament lamp (bulb)



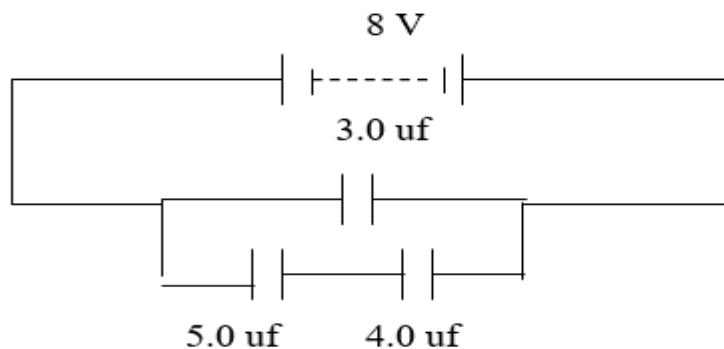
- (i) Draw a well labeled working circuit diagram showing the apparatus that can be used to obtain a set of readings used to draw the graph in (figure9). **(2marks)**
- (ii) Explain why the filament lamp does not obey ohm's law **(2 marks)**
- (iii) Explain how resistance of the filament lamp varies as current increases. **(1 mark).**
- (iv) State the characteristics of material wire used in the filament lamp. **(1 mark).**
15. (a) Define capacitance of a capacitor. **(1 mark)**
- (b) (i) Describe the essential features in the construction of a parallel plate capacitor. **(3 marks)**
- (iii) Explain how charge is distributed in such parallel capacitor in b(i) above. **(2marks)**
- (c) In an experiment to charge a capacitor, the charge stored was measured for different values of charging potential difference. A graph of charge stored Q (μC) (y-axis) against potential difference p.d (v) was plotted as shown graph 1



- (i) List down the apparatus used to perform this experiment **(1 mark)**
- (ii) Draw a circuit diagram showing all connections of the listed apparatus in (i) above to perform the experiment of charging a capacitor. **(2 marks)**

From the graph

- (ii) Determine the capacitance of the capacitor used in this experiment. **(3 marks)**
- (iii) Calculate the energy stored in this capacitor. **(2 marks)**
- (d) Three capacitors are connected as shown in figure 10.

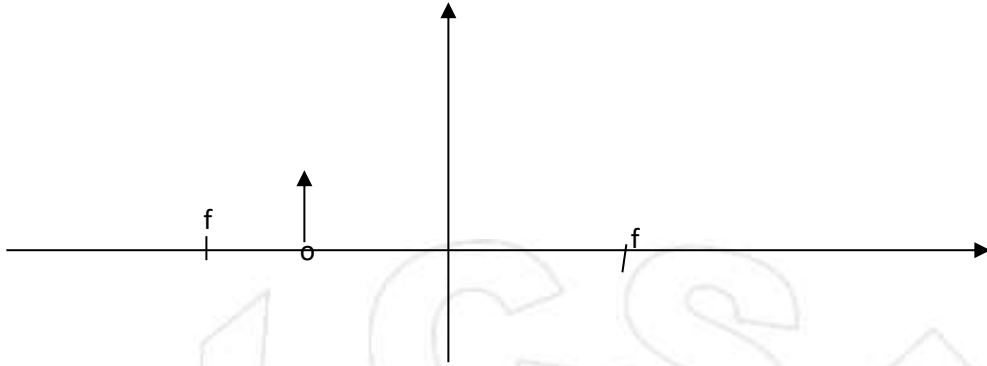


Calculate:

(i) Total effective capacitance in the circuit. (2 marks)

(ii) The charge on a $4.0\ \mu\text{F}$ capacitor. (2 marks)

16. (a) Complete figure 11 by drawing two rays to show the final image formed by convex lens of the object O, shown (2 marks)



(b) Describe the characteristics of the image formed in 16 (a) above (3 marks)

(c) State the optical device that uses the arrangement in (a) above. (1 mark)

(d) A person viewing a near object switches attention to look at an aero-plane far away.

(i) State the change that occurs in his eye in order to see the aero-plane clearly. (2 marks)

(ii) If this person fails to see the aero-plane clearly, what defect is he suffering from? (1 mark)

(iii) Explain with a diagram how the defect can be corrected. (3 marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 3**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- This paper consists of two sections A and B.
- Answer **all** the questions in the two sections in the spaces provided after each question
- All working **must** be clearly shown.
- Electronic calculators and Mathematical tables may be used.
- All numerical answers **should be expressed** in the **decimal** notations.

For Examiner use only

SECTION	QUESTION	MAX MARKS	SCORE
A	1 – 14	25	
B	15	12	
	16	10	
	17	09	
	18	14	
	19	10	
TOTAL		80	

SECTION A (25 MARKS)*For Marking Schemes Contact 0746-222-000 / 0753-222-000*

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

1. Figure 1. shows a micrometer screw gauge being used to measure the diameter of a ball bearing.

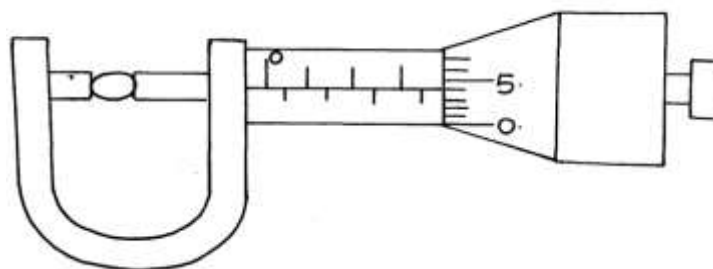


Fig.1

If the instrument has a negative zero error of 0.01mm, record the actual diameter of the ball bearing.

(1 mark)

2. Figure 2. shows drops of mercury and water on a glass surface,

Fig. 2



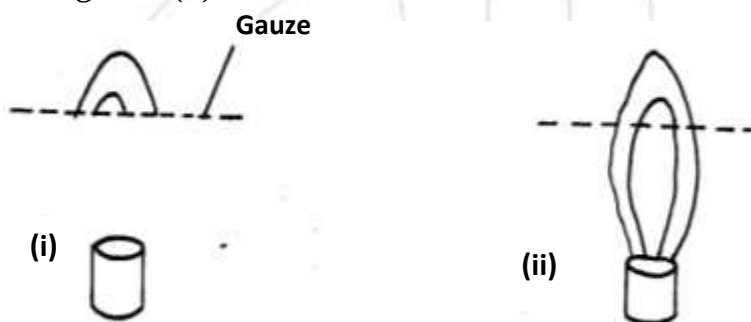
Explain the difference in the shapes of the drops.

(2 marks)

3. State why diffusion is faster in gases than in liquids.

(1 mark)

4. When a Bunsen burner is lit above a wire gauze, it is observed that the flame initially burns above the gauze shown in figure 3 (i). After sometime, the flame burns below as well as above the gauze as shown in figure 3(ii).



Explain the observation.

(2 marks)

5. In an experiment to demonstrate Brownian motion, smoke was placed in a smoke cell and observed using a microscope. The smoke particles were seen moving randomly in the cell.

Explain the observation.

(1 mark)

6. A paper vane in a horizontal axis was placed above a Bunsen burner as shown in figure 4.

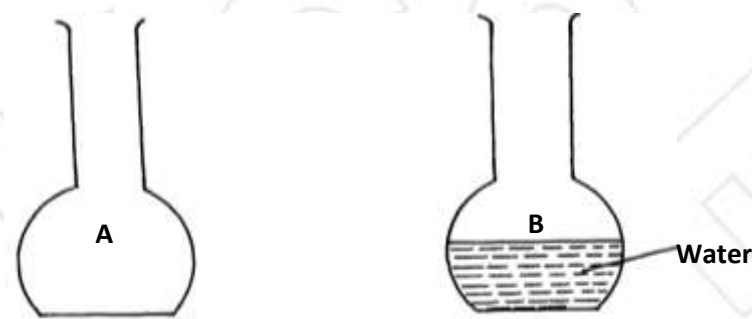
When the burner was lit, the paper vane began to rotate. Explain the observation.

(2 marks)



7. An electric kettle with shiny outer surface is more efficient than one with a dull outer surface, give a reason for this. (1 mark)
8. What is the reason why trailers carrying heavy loads have many wheels. (1mark)
9. Two flasks **A** and **B** were placed on a horizontal surface as shown in figure 5.

Fig. 5

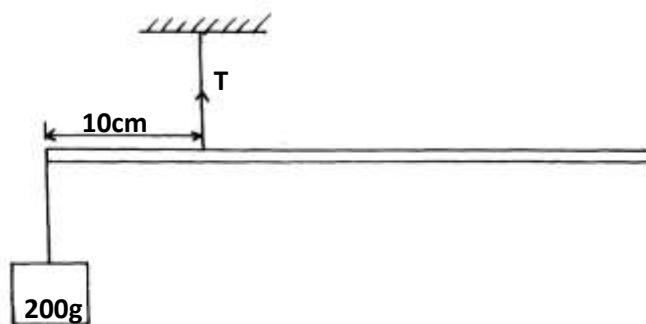


State and explain which flask is more stable. (2 marks)

10. Figure. 6 below shows a metre rule balancing when a mass of 200g is hung at one end.

Determine the tension, T in the string. (3 marks)

Fig. 6



11. State Newton's second law of motion. (1 mark)
12. A pipe of diameter 12mm is connected to another of diameter 18mm. if water flows in the wider pipe at the speed of 2m/s, determine the speed of water in the narrow pipe. (3 marks)
13. On the axes provided in the figure 7, sketch the graph showing variation in pressure with volume of a fixed mass of gas that obeys Boyle's law. (1 mark)

Pressure (pa)

Volume (cm³)

14. An oil drop has a volume of 0.01mm³. When it is placed on the surface of water, it spreads out to form a circular patch of area 500cm².

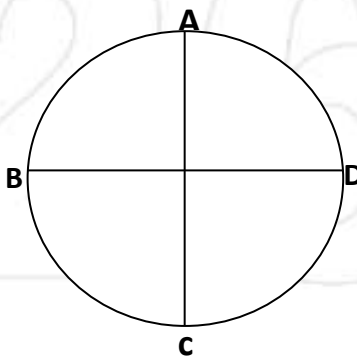
(i) Calculate the size of the molecule of the oil. (3 marks)

(ii) State **one** assumption made in (i) above. (1 mark)

SECTION B (55 marks)

15. (a) Define angular velocity (1 mark)

(b) the figure below shows an object of mass 0.2kg whirled in a vertical circle of radius 0.3m at uniform speed of 4m/s



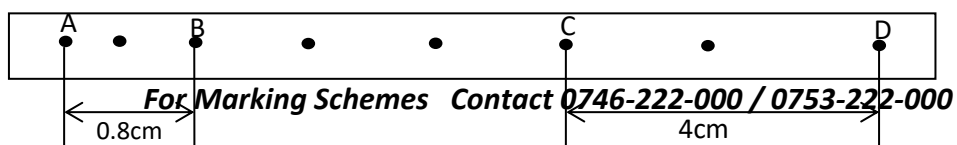
Determine the tension of the string at:

(i) Position A (2 marks)

(ii) Position B (2 marks)

(iii) Suggest the point where the string is likely to snap. (1 mark)

(d) The figure below shows the motion of a trolley on a ticker tape timer whose frequency is 100HZ



Determine:

(i) Initial velocity at points AB. (2 marks)

(ii) Velocity at points CD (2 marks)

(iii) Acceleration of the trolley during the motion. (2 marks)

16. (a) Give the reason why a density bottle is more accurate than a measuring cylinder when used to measure volume of liquids. (1 mark)

(b) State two precautions taken when using a density bottle. (2 marks)

(c) A form one student wanted to determine the density of copper. She wrote the following procedure: Study it and answer the questions that follow.

- Measure the mass x_1 (g) of a clean dry empty density bottle
- Fill the bottle partly with copper turnings and measure the mass x_2 (g)
- Fill the bottle with water up to the neck and measure its mass x_3 (g)
- Empty the bottle and rinse it.
- Fill it with water and replace the stopper. Measure the mass x_4 (g) of the bottle filled with water.

Write an expression for:

(i) Volume of the bottle (2 marks)

(ii) Mass of copper turnings (1 mark)

(iii) Volume of copper turnings. (2 marks)

(iv) Density of copper. (2 marks)

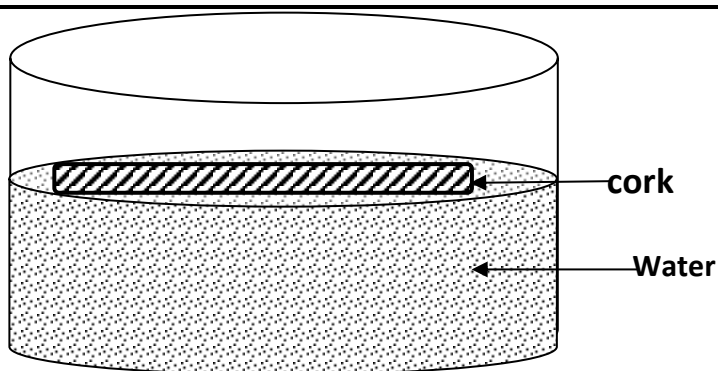
17. (a) State the law of floatation (1 mark)

(b) A metal block weighs 0.8N is suspended by a string in water. If the block is completely immersed in water the tension in the string is 0.5N. Find

(i) The upthrust on the block (1 mark)

(ii) The density of the block. (3 marks)

(c) The figure below shows a cork of mass 25g floating in water.



Determine the minimum volume of copper that must be attached so that the two will just submerge. (Relative density of copper = 9.0, Relative density of cork = 0.25) **(3 marks)**

(d) Explain how a submarine can be made to.

(i) Float on water **(1 mark)**

18. (a) You are provided with the following apparatus:

A filter funnel, a thermometer, a stop watch, ice at 0°C , an immersion heater rated P watts, a beaker, a stand, boss and clamp and a weighing machine.

Describe an experiment to determine the specific latent heat of fusion of ice. Clearly state the measurements to be made. **(3 marks)**

(b) 200 g of ice at 0°C is added to 400g water in a well lagged calorimeter of mass 40g. The initial temperature of the water was 40°C . If the final temperature of the mixture is $X^{\circ}\text{C}$, (Specific latent of fusion of ice $L = 3.36 \times 10^5 \text{ Jkg}^{-1}$, specific heat capacity of water, $c = 4200 \text{ Jkg}^{-1}\text{K}^{-1}$, specific heat capacity of copper = $400 \text{ Jkg}^{-1}\text{K}^{-1}$.)

(i) Derive an expression for the amount of heat gained by ice to melt it and raise its temperature to $X^{\circ}\text{C}$ **(2 marks)**

(ii) Derive an expression for the amount of heat lost by the calorimeter and its content when their temperature falls to $X^{\circ}\text{C}$. **(2 marks)**

(iii) Determine the value of X . **(3 marks)**

(c) A hydrogen balloon of volume 1.2 m^3 is released at the ground level where the pressure is 680 mmHg and a temperature of 20°C . Determine the volume of the balloon at a height of 2500m above the ground where the pressure drops to 500 mmHg and the temperature is 4°C . **(4 marks)**

19. A balloon seller has a cylinder of helium gas which he uses to blow up his balloons. The volume of the cylinder is 0.10 m^3 . It contains helium gas at a pressure of $1.0 \times 10^7 \text{ Nm}^{-2}$. The balloon seller fills each balloon to a volume of $1.0 \times 10^{-2} \text{ m}^3$ and a pressure of $2.0 \times 10^5 \text{ N/m}^2$

(a) Explain in terms of particles how the helium in the cylinder produces a pressure **(1 mark)**

(b) Calculate the total volume that the helium gases occupy at a pressure of $1.2 \times 10^5 \text{ N/m}^2$.

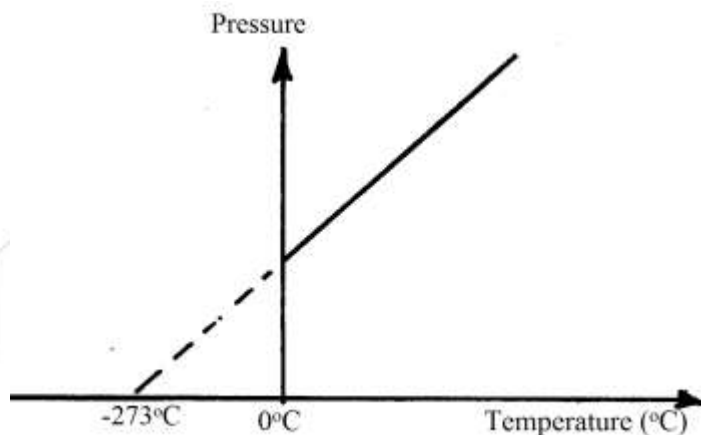
Assume the temperature of the helium does not change

(3 marks)

(c) Calculate the number of balloons of volume $1.0 \times 10^{-2} \text{ m}^3$ that the balloon seller can fill using the gas

(2 marks)

(d) The graph below shows how the pressure of a gas trapped inside a sealed container changes with temperature. The pressure is caused by the gas particles continually hitting the sides of the container.



(i) Write down the name of the temperature at which the gas particles stop hitting the sides of the container

(1 mark)

(ii) What is the momentum of the gas particles at this temperature? Give reason for the Answer

(2 marks)

(iii) Give the value of the temperature in Kelvin

(1 mark)

END

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 3**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- (a) Write your name, index number in the spaces provided above.
- (b) Sign and write the date of the examination in the spaces provided
- (c) This paper consists of **TWO** Sections: **A** and **B**.
- (d) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- (e) All working **MUST** be clearly shown.
- (f) KNEC mathematical tables and silent non-programmable electronic calculators may be used.

FOR EXAMINERS USE ONLY

Section	Question	Maximum score	Candidates score
A	1-13	25	
B	14	11	
	15	11	
	16	13	
	17	10	
	18	10	
	TOTAL SCORE	80	

SECTION A: 25marks

1. The chart below shows an arrangement of different parts of the electromagnetic spectrum.

Radio wave	A	Infrared rays	B	Ultra-violet	γ -Rays
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Name the radiation represented by

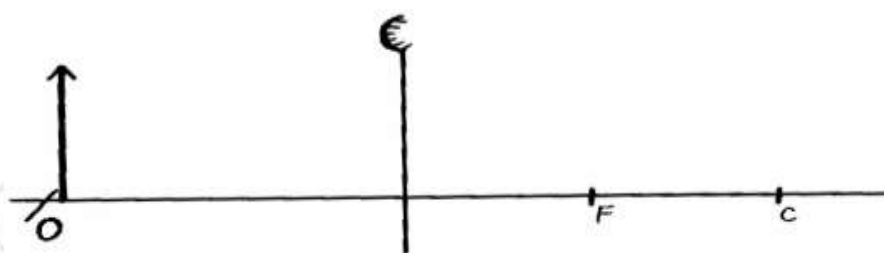
A

(1mark)

State one use of radiation represented by B

(1mark)

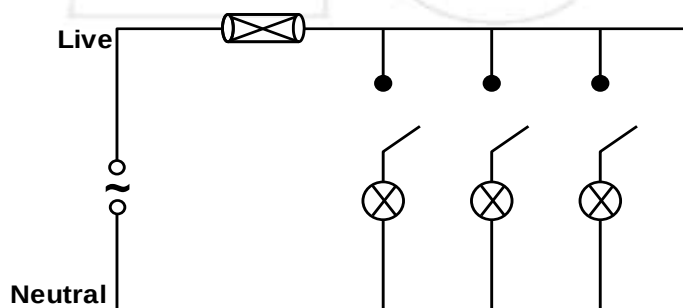
2. An object O is placed in front of convex mirror as shown in the diagram below. Complete the diagram to locate the position of the image, 1. (3 marks)



3. The figure below shows a wire carrying current whose direction is out of the paper. The wire is placed in a magnetic field.

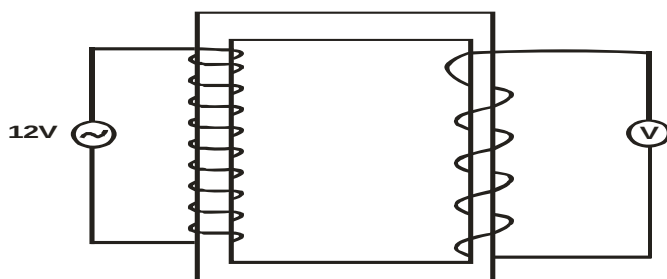


- (a) Indicate on the figure the direction of the force F , acting on the wire. (1 mark)
- (b) State what would be observed on the wire if the direction of the current is reversed. (1 mark)
4. The figure below shows part of the lighting circuit of a house.



- i) Give a reason why a fuse is included in the circuit. (1 mark)
- ii) If each lamp has a power of 60W at voltage of 240V. Calculate the current through one lamp when it is switched on. (2 marks)

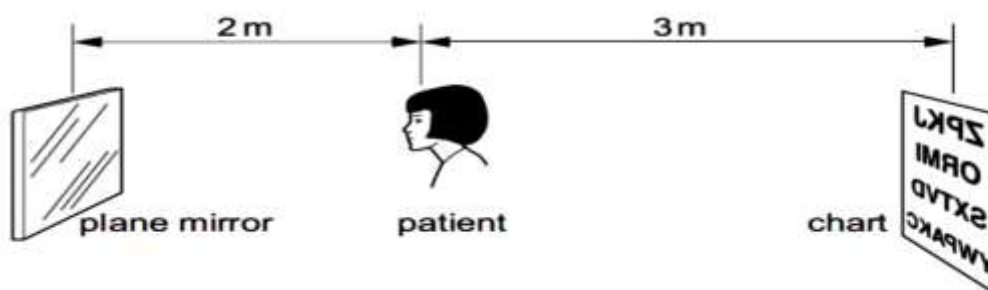
5. Figure 5 below shows a simple transformer connected to a 12v a.c source and an a.c voltmeter.



Determine the reading on the voltmeter.

(2 marks)

6. The diagram shows a patient having her eyes tested. A chart with letters on it is placed behind her and she sees the chart reflected in a plane mirror.



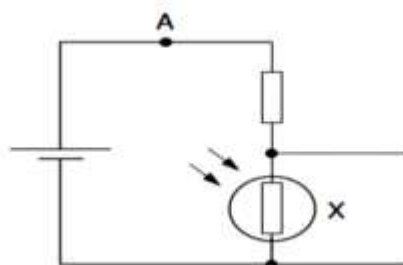
Determine how far away from the patient, the image of the chart is seen.

(2 marks)

7. **State** Snell's law.

(1 mark)

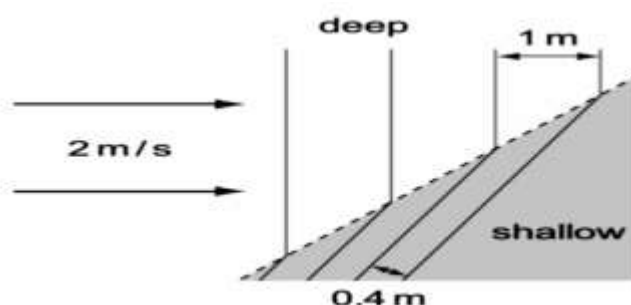
8. The figure below shows an electric circuit.



State and explain how the potential difference across X varies as the light shining on it becomes brighter.

(2marks)

9. Waves pass from deep water to shallow water and refraction occurs.



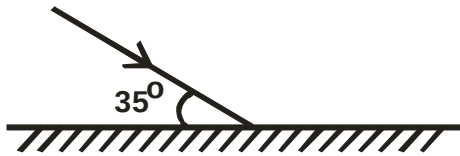
Calculate the speed of the waves in the shallow water

(2 marks)

10. The diagram below shows a ray of light striking the plane at 35° as shown below.

State the angle of reflection.

(1 mark)



11. The figure below shows an iron bar being magnetized by stroking it with a magnet.



Indicate on the iron bar the polarity of resulting magnet.

(1 mark)

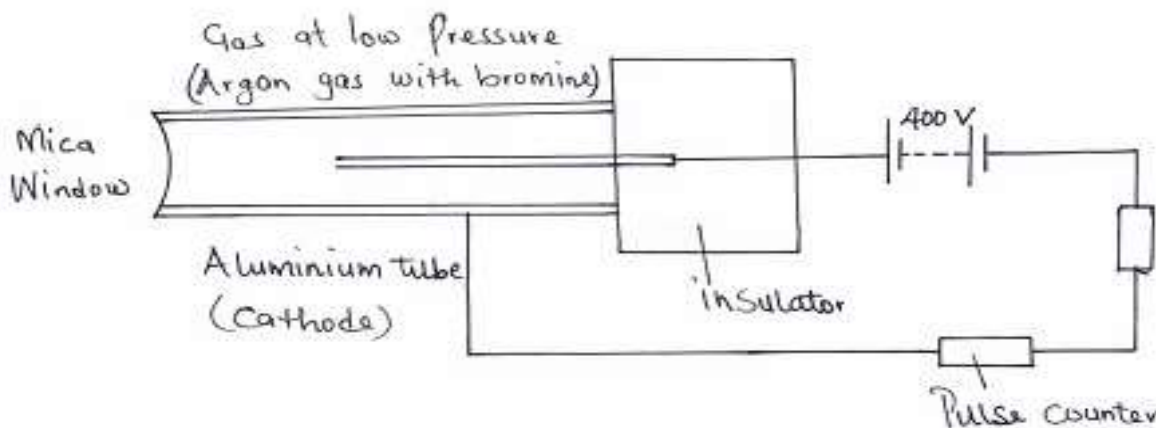
12. An echo sounder of a ship transmits sound waves to the depth of the sea and receives the echo after 2.4 seconds. If the speed of sound in water is 1600ms^{-1} , determine the depth of the sea.

(3 marks)

13. It is observed that when a charged body is brought near the cup of a positively charged electroscope, the divergence of the leaf increases. State the type of charge on the body. **(1mark)**

SECTION B (55 marks)

14. (a) The figure below shows a diagram of a Geiger Muller tube connected to a power supply and a pulse counter.



(i) Why should the argon gas be at low pressure?

(1mark)

(ii) State the purpose of the bromine gas in the tube.

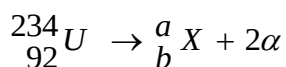
(1mark)

(iii) Suggest one way of increasing the sensitivity of the tube

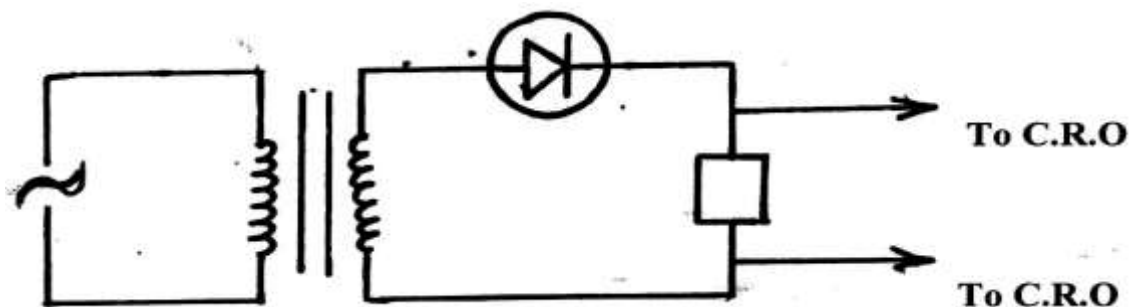
(1mark)

(iv) Find the value of a and b in the following equation.

(2marks)



b) The figure below shows a PN junction diode used in a rectifier.



i)) What is an extrinsic semi conductor?

(1mark)

ii) What type of rectification is shown?

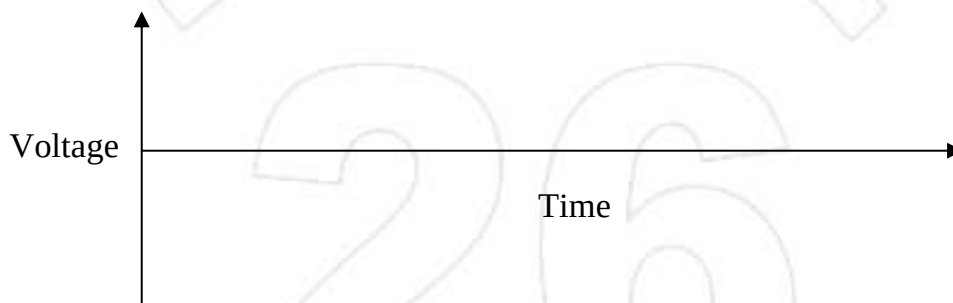
(1mark)

iii) Describe how the rectification is achieved

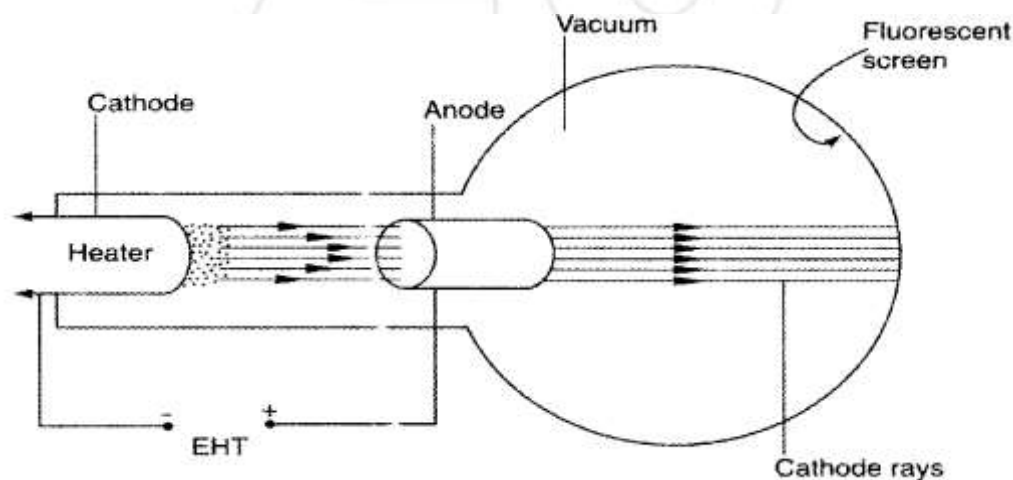
(2marks)

iv) In the space provided below, sketch the output signal displayed on the CRO during the rectification process.

2marks)



15. The figure below shows a cathode ray tube

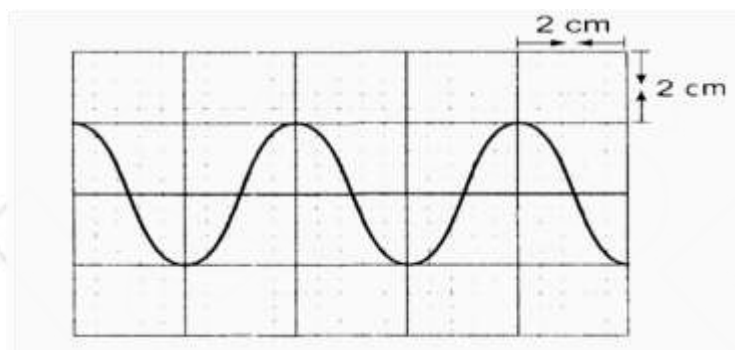


a) State the function of the

i) Heater

(1mark)

- ii) Extra High Tension (E.H.T.) (1 mark)
- b) State how the intensity of the fluorescence on the screen can be increased. (1 mark)
- b) State how the intensity of the fluorescence on the screen can be increased. (1 mark)
- c) State the effect of having air in the tube instead of a vacuum (1 mark)
- d) State one properties of cathode rays (1 mark)
- e) Distinguish cathode rays and X-rays (1 mark)
- f) Give one advantages of using a C.R.O instead of a voltmeter in measuring voltages (1 mark)
- g) The figure below shows an a.c. voltage. If the Y-gain control reads 10V/cm and the time base reads 5 milliseconds/cm



Calculate:

- i) The frequency of the alternating voltage (2 marks)
- ii) Peak to peak voltage of the alternating voltage (2 marks)
- 16 (a)(i) It is observed that when ultra- violet radiation is directed onto a clean zinc plate connected to the cap of a negatively charged leaf electroscope, the leaf falls .Explain this observation (2 marks)
- (ii) State why this observation does not occur if the electroscope is positively charged (1 mark)
- (iii) ,Explain why the leaf of the electroscope does not fall when infra- red radiation is directed onto the zinc plate (1 mark)
- b) State the effect on the electrons emitted by the photoelectric effect when:
- (i) The intensity of incident radiation is increased (1 mark)
- (ii) The frequency of the incident radiation is increased (1 mark)
- c) **Light** of wavelength $4.3 \times 10^{-7} \text{ m}$ is incident on two different metal surfaces, nickel and potassium. (Take speed of light as $3.0 \times 10^8 \text{ ms}^{-1}$ and planks constant h as $6.63 \times 10^{-34} \text{ Js}$).
- (i) Determine the energy of the incident radiation. (3 marks)

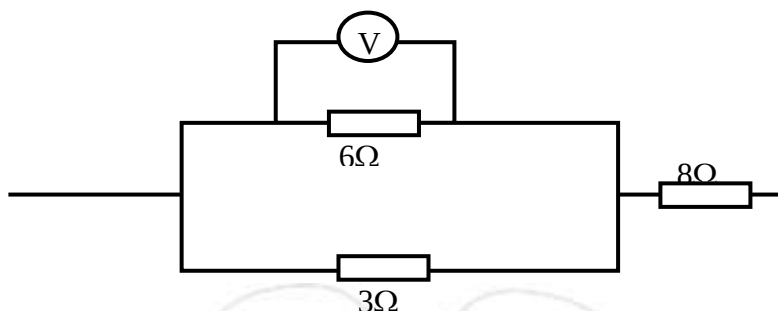
(ii) If the work function of nickel is $8.0 \times 10^{-19}\text{J}$ and that of potassium is $3.68 \times 10^{-19}\text{J}$, state with a reason from which of the two metals the given light will eject electrons. **(2 marks)**

(iii) Determine the velocity of the emitted electrons from the metal surface in b(ii).

(Take the mass of an electron as $9.1 \times 10^{-31}\text{ kg}$).

(2 marks)

17(a) The figure below shows three resistors as shown.



If the voltmeter reads 4V, find the

(i) Effective resistance

(3marks)

(ii) Current through the 3Ω resistor

(2 marks)

(iii) Potential difference across the 8Ω resistor if the voltage total voltage in the circuit is 10V

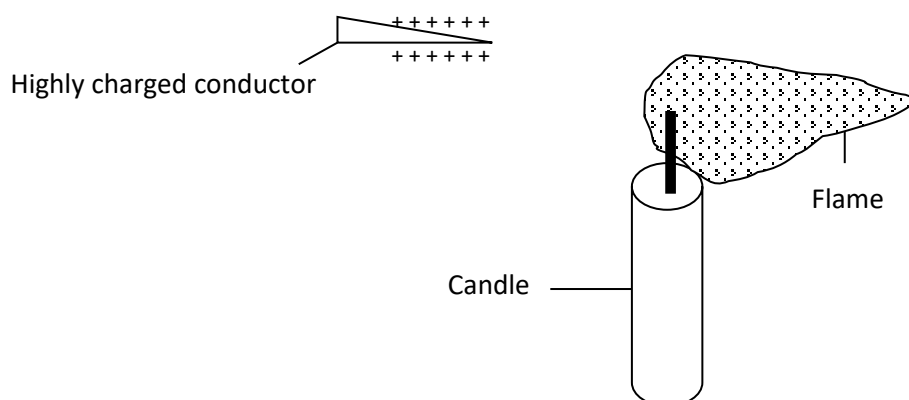
(1 mark)

(c) (i) What is meant by the term “terminal voltage” as used in current electricity? **(1mark)**

(ii) A cell supplies a current of 2.0A when connected to a 0.6Ω resistor and 1.5A when the same cell is connected to a 0.9Ω resistor. Find the e.m.f and the internal resistance of the cell.

(3marks)

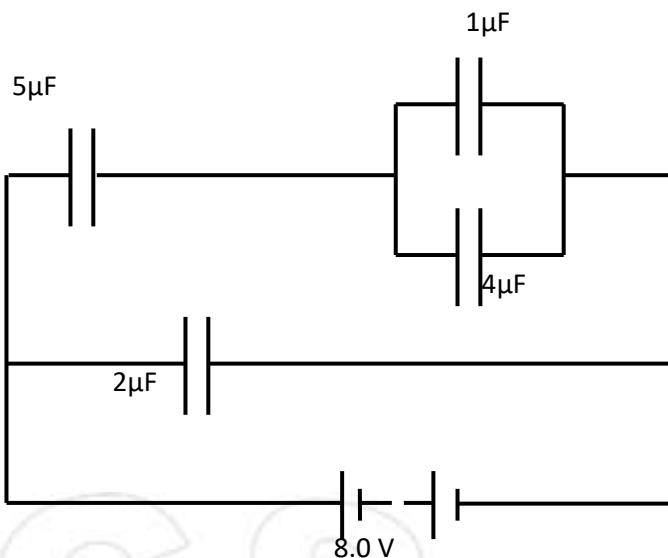
18((a) Give a reason why a candle flame is blown when a highly charged conductor is brought close to it as shown below. **(1mark)**



b) State two factors that affect capacitance of a capacitor

(2 marks)

c) The figure below shows $1\mu\text{F}$, $2\mu\text{F}$, $4\mu\text{F}$ and $5\mu\text{F}$ capacitors connected to a battery.



Determine:

i) The total capacitance. (3marks)

ii) The total energy stored by the capacitors. (2marks)

iii) Voltage across the $4\mu\text{F}$ capacitor. (2marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 4**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***Instructions to candidates**

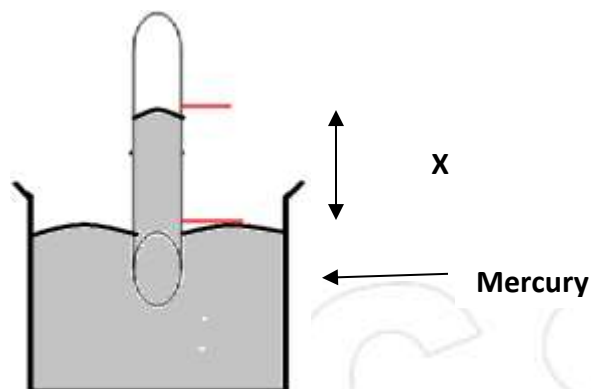
- Write your name and class in the space provided.
- This paper consists of two sections; **SECTION A** and **B**
- Answer **all** the questions in the spaces provided
- **ALL** working **MUST** be clearly shown.
- Mathematical tables and electronic calculators may be used
- Take: Acceleration due to gravity: $g = 10\text{m/s}^2$

For Examiner's Use Only

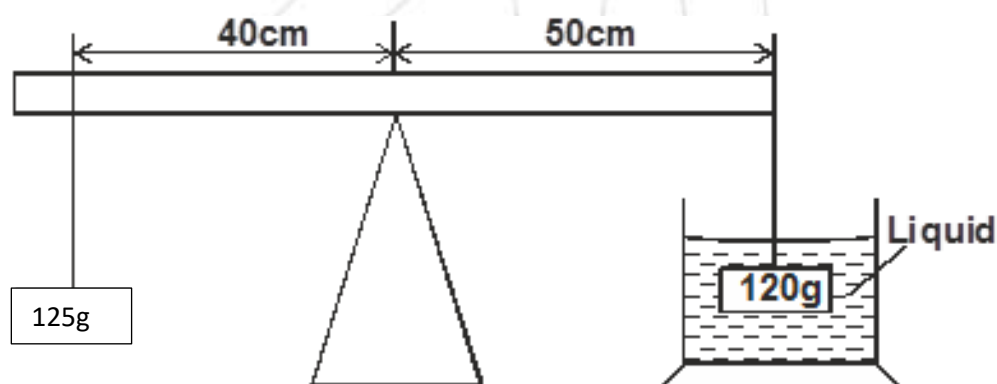
Section	Question	Maximum Score	Candidate's Score
A	1 – 12	25	
B	13	10	
	14	11	
	15	12	
	16	10	
	17	12	
	Total Score	80	

SECTION A (25 MARKS)

1. With a reason identify in which state is diffusion faster between gas and liquid. **(2marks)**
2. The length of the spring is 20.0cm. It becomes 24.0cm when a weight of 8.0N hangs on it.
Calculate the length of the spring when supporting a weight of 200N. **(2marks)**
3. The figure below shows the instrument used to measure pressure

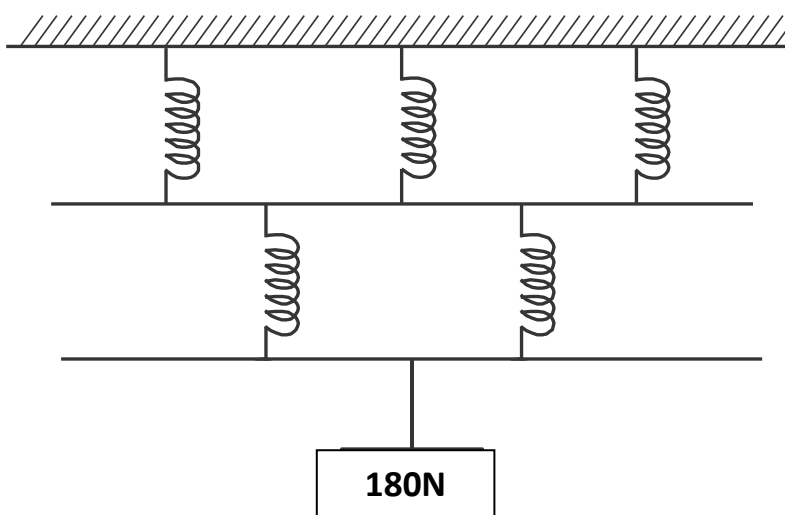


- a. Name the instrument **(1mark)**
- b. What would be observed if the test tube is tilted assuming the instrument is functioning normally **(1mark)**
4. The rate of heat flow in thermal conductivity increases with increase in cross-section area.
Explain this observation **(1mark)**
5. Explain why a small car travelling at a very high speed is likely to be dragged into a long track travelling in the opposite direction **(2marks)**
6. A uniform meter rule is balanced by two masses as shown in the figure below.



By displacement method, the immersed object is found to occupy 13.5cm^3 . Determine the density of the liquid in SI units. **(3 marks)**

7. The springs shown in the arrangement in figure 4 below are identical.



Given that the 180N weight causes a total extension of 30cm, determine the spring constant of each spring. (The weight of each spring is negligible) **(3 marks)**

8. i) Distinguish between elastic collision and inelastic collision. **(1 mark)**

ii) State the energy transformation during inelastic collision. **(2 marks)**

9. State the branch of physics that deal with kinetic energy of matter. **(1 mark)**

10. The water in a burette is 30.6cm^3 , 50 drops of water each of volume V are added to the water in the burette. The final reading of the burette was 20.6cm^3 . Calculate the radius of the drop of water **(3 marks)**

11. State two factors that affect the stability of an object **(2 marks)**

12. State a reason why a burn from steam at 100°C is more severe than a burn from boiling water at the same temperature **(1 mark)**

SECTION B: (55 MARKS)

13. a) An astronaut in orbit round the earth may feel weightless even when the earth's gravitational field still acts on him. Explain **(2 marks)**

b) Distinguish between angular velocity and linear velocity **(1 mark)**

c) a stone is whirled with uniform speed in a horizontal circle of radius 15 cm. it takes the stone 10 seconds to describe an arc of length 4cm. calculate

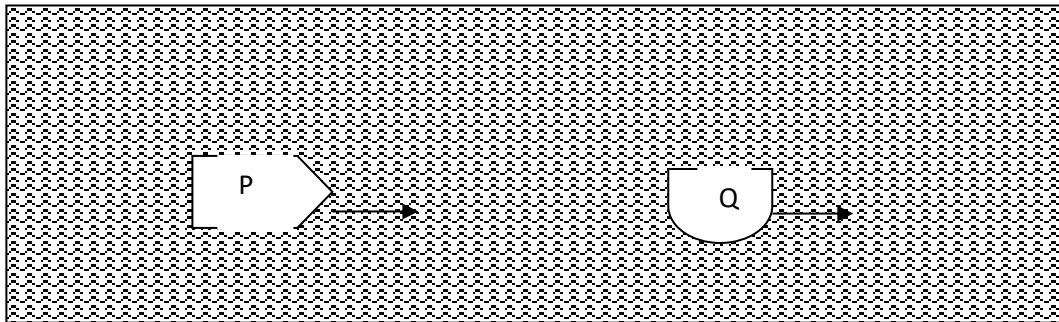
i) Angular velocity **(3 marks)**

ii) Linear velocity of the stone **(2 marks)**

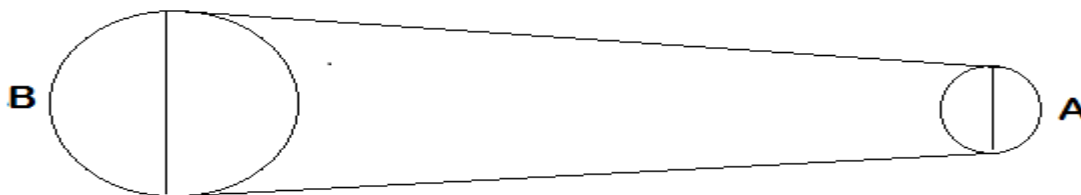
iii) Periodic time **(2 marks)**

14. a) State the Bernoulli's principle of fluids **(2 marks)**

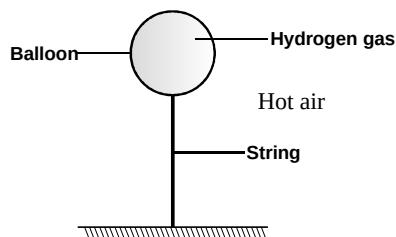
- b) In derivation of equation of continuity in fluids, state two assumptions to be made. **(2marks)**
- b) The figure below shows cross-section of two submerged bodies P and Q in an ocean. The bodies were then pulled by a ship in the direction shown.



- State with a reason, which body is easier to pull if they have equal volume and density **(2 marks)**
- i) On the same diagram, show the path followed by each body and their streamlines **(2 marks)**
- c) Water flows steadily a pipe as shown in the figure below. The diameter of A and B are 3cm and 5cm. if the volume flux at A is $45\text{cm}^3/\text{s}$. find the speed of water at B. **(3 marks)**



15. a) State the law of floatation **(1 mark)**
- b) The diagram below shows a hot air balloon tethered to the ground on a calm day. The balloon contains 1300cm^3 of hot air of density 0.82 kg/m^3 . The mass of the material making the balloon without hot air is 420kg . The density of the surrounding air is 1.35 kg/m^3 . Determine

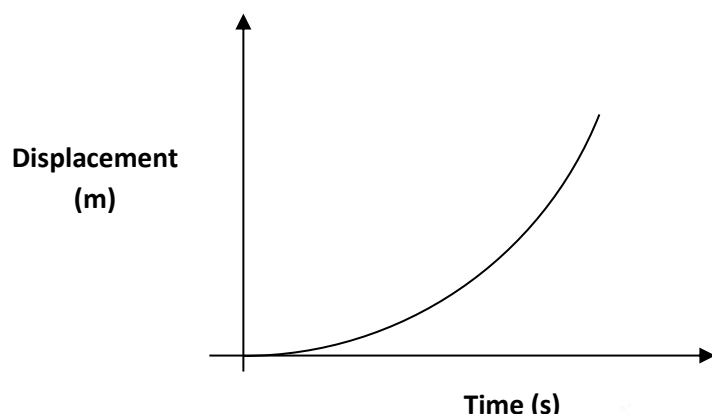


- i) The total weight of hot air balloon **(3 marks)**
- ii) The weight of air displaced by the balloon **(2 marks)**
- iii) Upthrust force on the balloon **(1 mark)**

iv) the tension in the rope holding the balloon in the ground. **(2 marks)**

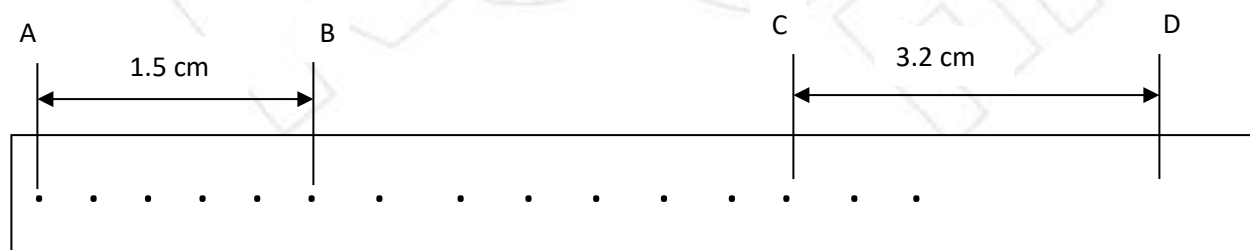
v) the acceleration with which the balloon begins to raise when **released**. **(3marks)**

16. a) the graph below represents a body moving with variable speed



on the same graph sketch the results of the same body moving at a lower velocity. **(1 marks)**

b) A paper tape was attached at a moving trolley and allowed to run through a ticker timer. If the frequency of the tape is 100Hz. Determine

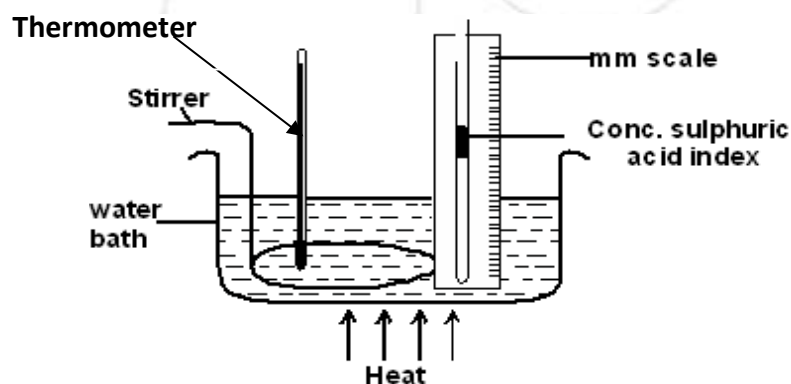


i) The period of the ticker timer **(2 marks)**

ii) Velocity AB and CD **(4 marks)**

ii) The average acceleration **(3 marks)**

17. a) Figure 9 shows a set up to investigate one of the gas laws. All equipment are standardized.



i) Name the gas law being investigated. **(1 mark)**

ii) Give two reasons for using the concentrated sulphuric acid index. **(2 marks)**

iii) What is the purpose of the water bath? **(1 mark)**

- iv) State two measurements that should be taken in this experiment. **(2 marks)**
- v) Explain how the measurements taken in (iv) above may be used to verify the law. **(3 marks)**
- b) A gas has a volume of 30cm^3 at 18°C and normal atmospheric pressure. Calculate the new volume of the gas if it is heated to 54°C at the same pressure. **(3 marks)**

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KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 4**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO THE CANDIDATES:**

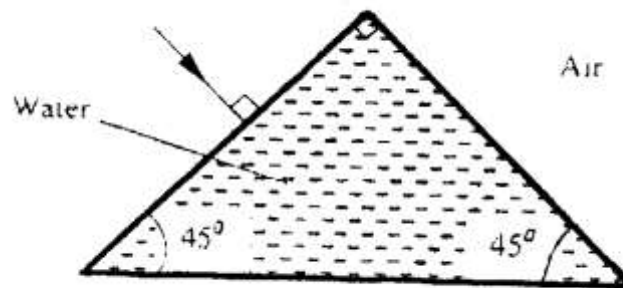
- Write your **name** and **index number** in the spaces provided above
- This paper consists of **two** sections **A** and **B**.
- Answer **all** questions in section **A** and **B** in the spaces provided.
- All working **must** be clearly shown in the spaces provided.
- Mathematical tables and electronic calculators may be used.
- Take 'g' 10m/s²

FOR EXAMINERS' USE ONLY

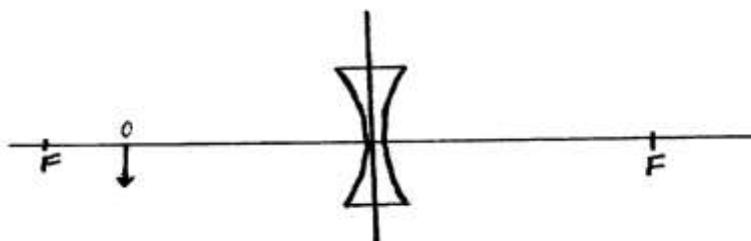
SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 - 14	25	
B	15	15	
	16	14	
	17	14	
	18	12	
TOTAL		80	

SECTION A

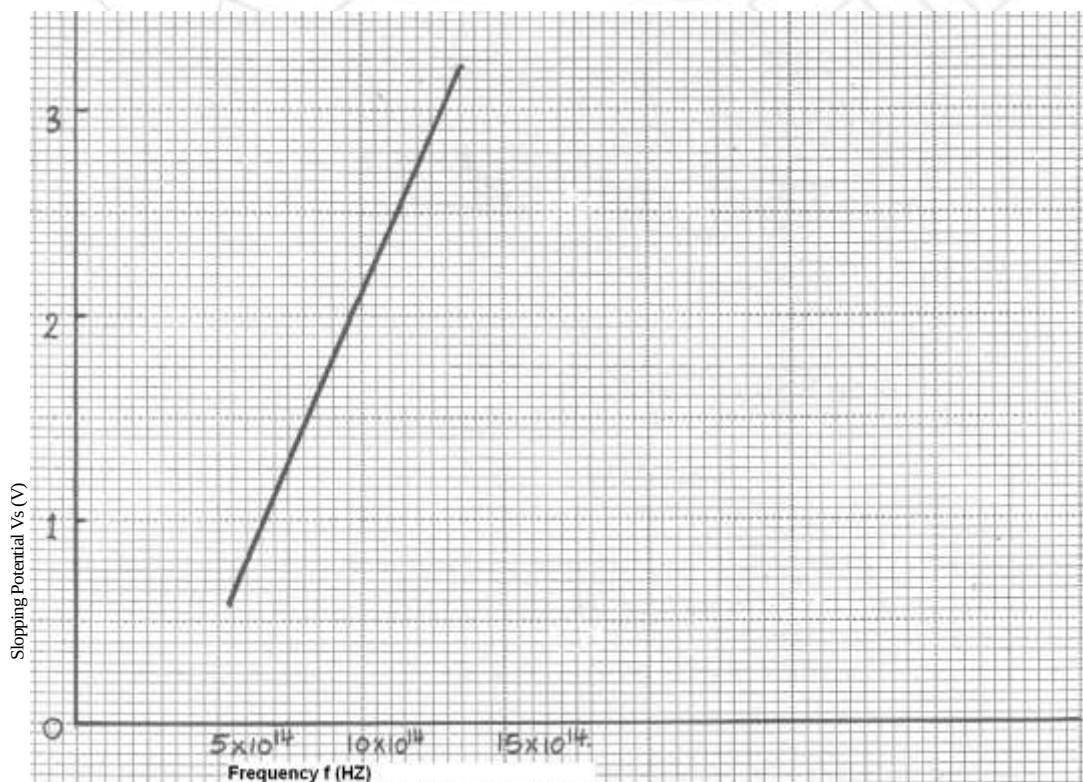
1. What property of light is suggested by the formation of shadows? (1 mks)
2. You are provided with the following; A cell and holder, a switch, a rheostat, an Ammeter, a voltmeter and connecting wires. Draw a diagram for a circuit that could be used to investigate the variation of the potential difference across the cell with the current drawn from the cell. (2mks)
3. An un-magnetized steel rod is clamped facing North-South direction and then hammered repeatedly for some time. When tested, it is found to be magnetized. Explain this observation. (2mks)
4. A lady holds a large concave mirror of focal length 1 m, 80 cm from her face, state two characteristics of her image in the mirror. (2 mks)
5. A girl brought a positively charged rod close to the cap of a gold leaf electroscope; she observed that the gold leaf diverged further. Explain this observation. (2mks)
6. In an experiment using a ripple tank the frequency, f , of the electric pulse generator was reduced to one third of its value. How does the new wavelength compare with the initial wavelength? (3 marks)
7. Figure 1 shows a ray of light incident on the face of a water prism

**FIG. 1**

- Sketch the path of the ray as it passes through the prism. Critical angle for water is 49° (1mk)
8. A heating coil is rated 100W, 240V. At what rate would it dissipate energy if it is connected to a 220V supply? (3mk)
 9. Figure 2 shows an object O placed in front of a concave lens with principal foci F and F. Construct a ray diagram to locate the position of the image (1mk)



10. State the difference between X-rays and Gamma rays in the way in which they are produced. (1mk)
11. A 60W bulb is used continuously for 36 hours. Determine the energy consumed. Give your answer in kilowatt hour (kwh). (2mks)
- 12 A narrow beam of electrons in a cathode ray oscilloscope (CRO) strike the screen producing a spot. State what is observed on the screen if a low frequency a.c source is connected across the y- input of the CRO (1mk)
- In an experiment on photo- electricity using metal X, the graph shown in figure 3 was obtained Use the graph to answer questions 13.



13. Determine the minimum frequency F_0 below which no photoelectric emission occurs. (1mk)
- 14 .You are provided with 12V a. c source, four diodes and resistor. Draw a circuit diagram for a full wave rectifier and show the points at which the output is taken. (2mk)
15. (a) Given a bar magnet, an iron bar and a string

- (i) Describe a simple experiment to distinguish between the magnet and the iron bar
- (ii) State with reasons the observation that would be made in the experiment. **(2mks)**
- (b)** In an experiment to magnetize two substances P and Q using electric current, two curves (graphs) were obtained as shown in figure 4

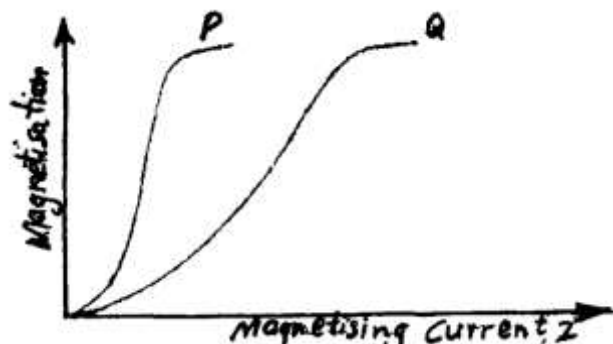


FIG.4

- Using the information in fig. 4 explain the differences between substances P and Q with references to the domain theory **(6mks)**
- (c)** In the set up in figure 5, the suspended metre rule is in equilibrium balanced by the magnet and the weight shown. The iron core is fixed to the bench.

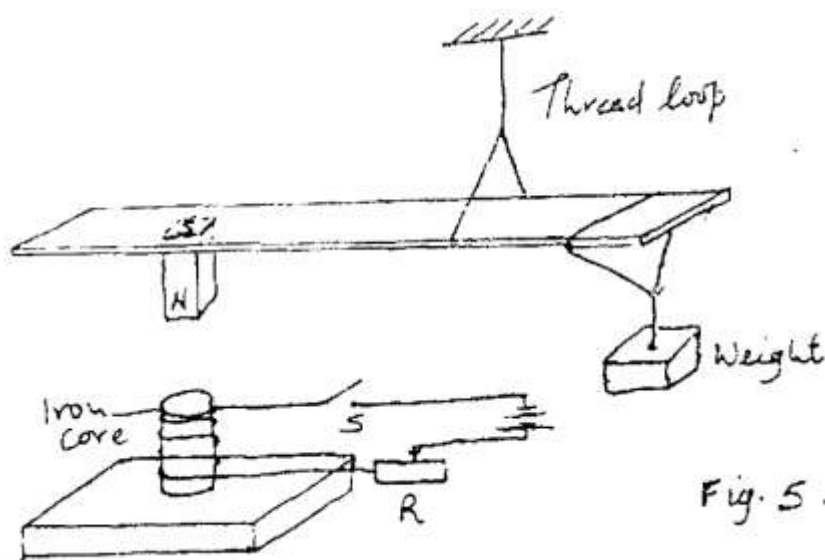


Fig. 5.

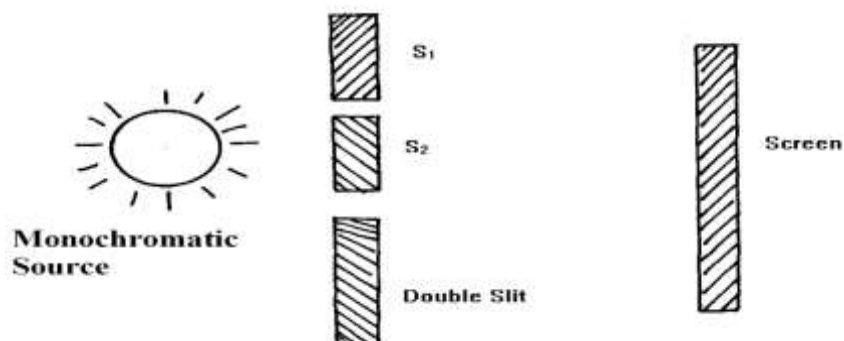
- (i)** State the effect on metre rule when the switch S is closed. **(1mk)**
- (ii)** What would be the effect of reversing the battery terminals? **(1mk)**
- (iii)** Suggest how the set up in figure 5 can be adapted to measure the current flowing in the current circuit. **(3mk)**
- 16. (a) (i)** What is the difference between longitudinal and transverse waves? **(1mk)**
- (ii)** State two distinctions between the way sound waves and electromagnetic waves are transmitted **(2mk)**

(b) A mineworker stands between two vertical cliffs 400m from the nearest cliff. The cliffs are X distance apart. Every time he strikes the rock once, he hears two echoes, the first one after 2.55 s, while the second follows 2s later. From this information; calculation:

(i) The speed of the sound in air (2mk)

(ii) The value of X (3mk)

(c) In an experiment to observe interference of light waves a double slit is placed close to the source. See figure 5



(i) State the function of the double slit (1mk)

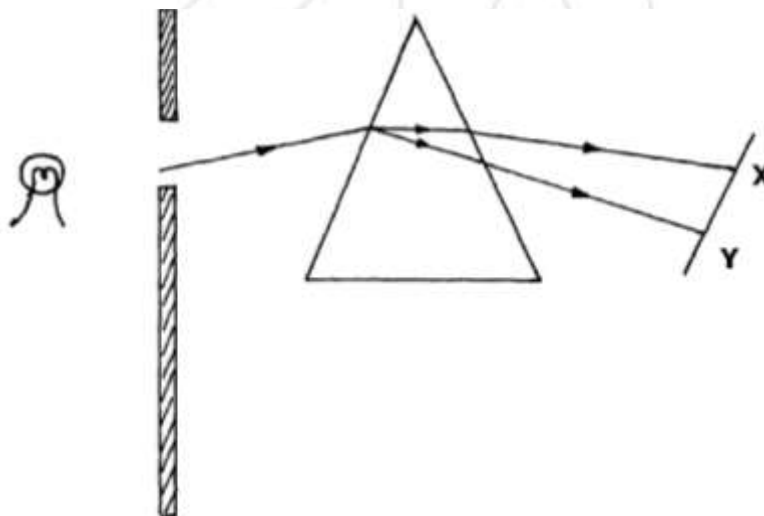
(ii) Describe what is observed on the screen (2 mks)

(iii) State what is observed on the screen when

i). The slit separation S_1S_2 is reduced (1mk)

ii) **White** light source is used in place of monochromatic source (1mk)

17.a)The diagram in figure 6 below shows a narrow beam of white light onto a glass Prism.



(i) What is the name of the phenomenon represented in the diagram? (1mks)

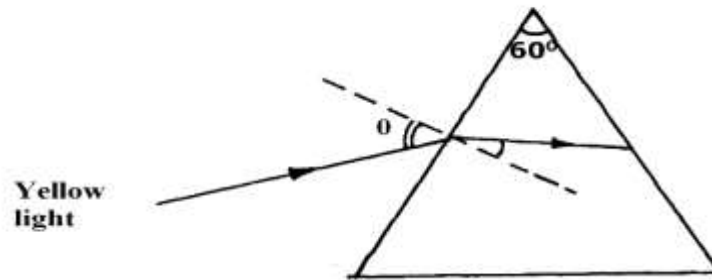
(ii) Name the colour at x and Y . (2mk)

(iii) Give a reason for your answer in part (ii) above. (1mk)

(iv) What is the purpose of the slit?

(1mk)

b) Figure 7 below shows the path of ray of yellow light through a glass prism. The speed of yellow light in the prism is 1.8×10^8 m/s.



i) Determine the refractive index of the prism material (Speed of light in vacuum, $C = 3.0 \times 10^8$ m/s) (3mks)

(ii) Show on the same diagram, the critical angle c and hence determine its value. (3mks)

(iii) Given that $r = 31.2^\circ$, determine the angle θ . (3mks)

18. (a) X- rays are used for detecting cracks inside meta' beams (i)State the type of the X- rays used.

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

(b) Figure 1 shows the features of an X- ray tube

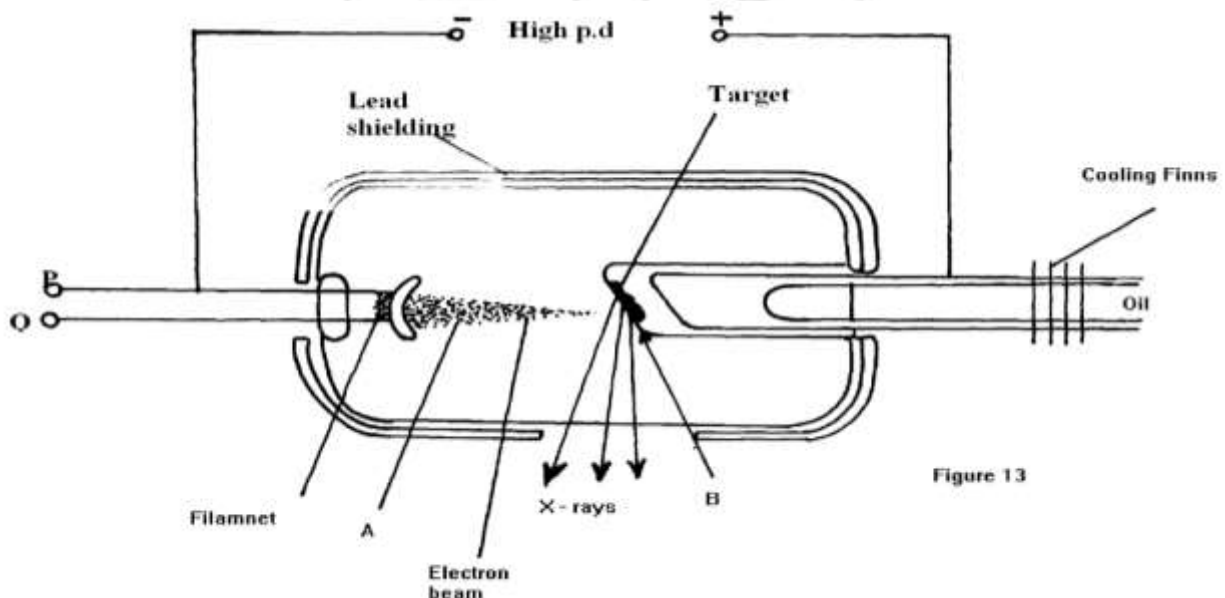


Figure 13

i) Name the parts labelled A and B. (2mks)

(ii) Explain how a change in the potential across P changes the intensity of the X- rays produced in the tube. (2 mks)

(iii) During the operation of the tube, the target becomes very hot. Explain how this heat is caused.

(2 mks)

(iv) What property of lead makes it suitable for use as shielding material?

(1mk)

(c) In a certain X-ray tube, the electrons are accelerated by a Pd of 12000V. Assuming all the energy goes to produce X-rays, determine the frequency of the X-rays produced. (Planck's constant $h = 6.62 \times 10^{-34}$ is and charge on an electron, $e = 1.6 \times 10^{-19}C$).

(3mks)

KCSE
26

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 5**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- ✓ The paper consists of TWO sections A and B.
- ✓ Answer all the questions in section A and B in the spaces provided
- ✓ All working **MUST** be clearly shown
- ✓ Non-programmable silent calculators and KNEC mathematical tables may be used.

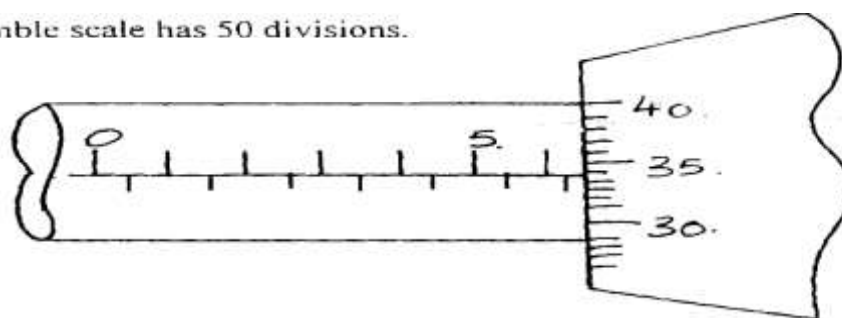
FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAX SCORE	SCORE
A	11-11	25	
B	12	11	
	13	10	
	14	10	
	15	13	
	16	11	
TOTAL SCORE		80	

SECTION A (25 MARKS)*For Marking Schemes Contact 0746-222-000 / 0753-222-000*

- The figure below shows a micrometer screw gauge being used to measure the diameter of a rod. The thimble scale has 50 divisions.

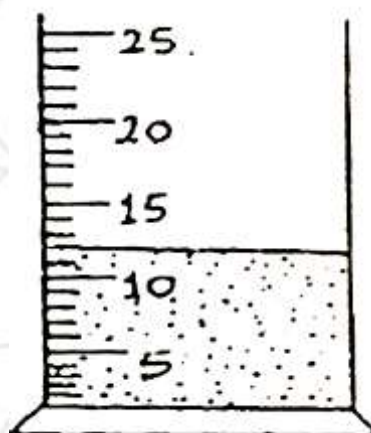
Thimble scale has 50 divisions.



State the reading shown above.

(2 marks)

- The figure below shows water placed in a measuring cylinder calibrated in cm^3



An object of mass 50.1g and density 16.7 g/cm^3 is lowered gently in the water. Indicate on the diagram the new level.

(1 mark)

- An object is attached to a spring balance and its weight determined in air. It is then gently lowered into a liquid in a beaker. State what will happen to the reading.

(1 mark)

- The figure below shows a uniform meter rule pivoted at the 23cm mark with a mass of 3.6kg hanging at 0cm mark the system is in equilibrium.

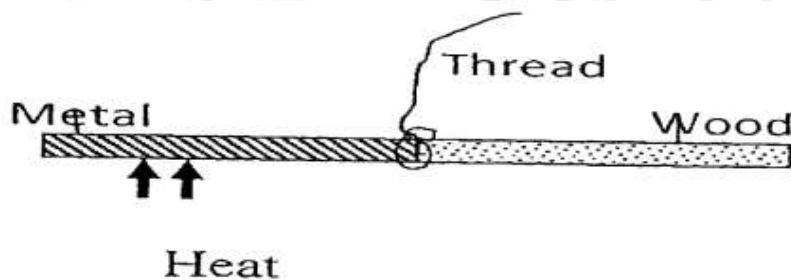


Determine,

- The weight of the rule

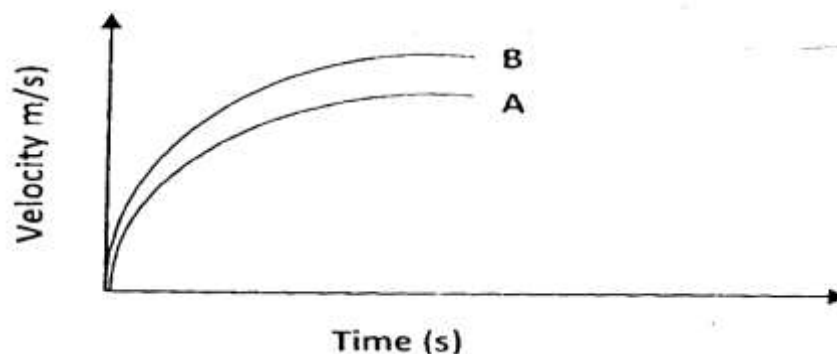
(2 marks)

- ii) The normal reaction force R at the rule (1 mark)
5. When a mercury in a glass thermometer is used to measure the temperature of hot water, it is observed that the mercury level first drops before beginning to rise. Explain (2 marks)
6. A trolley of mass 0.5kg moving with a velocity of 1.2m/s collides with a second trolley of mass 1.5kg moving in the direction with a velocity of 0.2m/s . If the collision is inelastic, determine the velocity of the trolleys after collision. (3 marks)
7. A block of copper of mass 2kg and specific heat capacity 400 J/kg K initially at 81°C is immersed in water at 20°C . If the final temperature is 21°C , determine the mass of water. (3 marks)
8. When a body of mass 0.25kg is acted on by a force, its velocity changes from 5m/s to 7.5m/s , determine the work done by the force. (3 marks)
9. The following figure shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium.



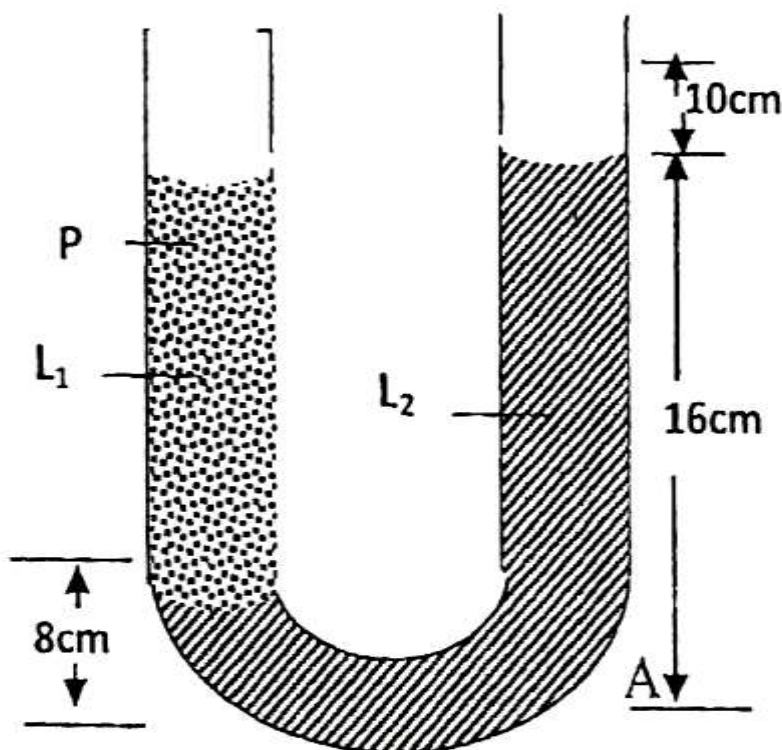
The side made of metal is now heated with a Bunsen flame. State with a reason, the side to which the rod is likely to tilt. (2 marks)

10. The figure shows the velocity time graph of two identical spheres released from the surfaces of two liquids A and B.



Give a reason why the terminal velocity of the sphere in B is higher than in A. (1 mark)

11. A u-tube vertically holds two liquids L_1 and L_2 as shown in the figure below.

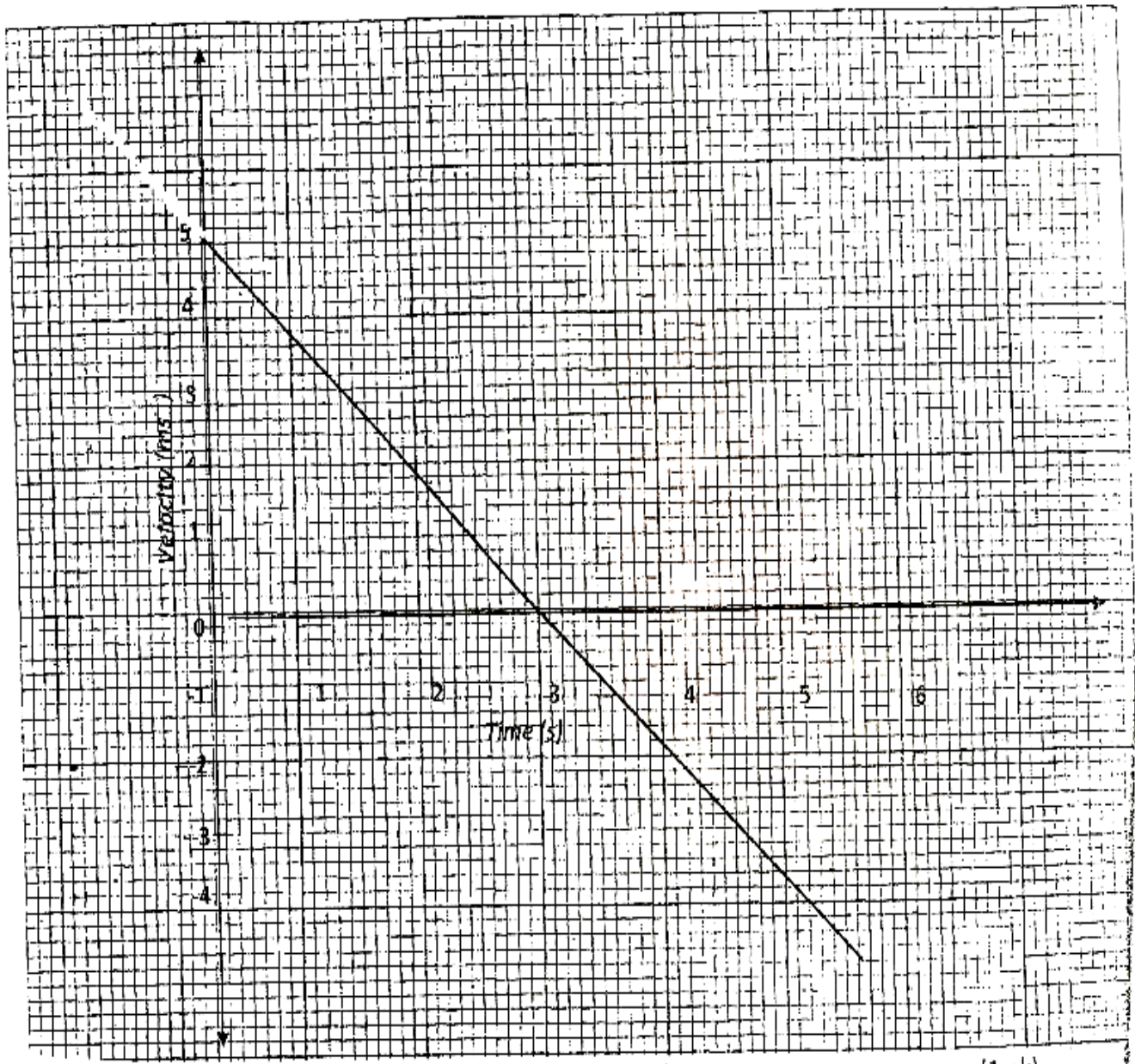


- (a) Mark accurately the point in liquid L_2 that is at the same pressure as point P (1 mark)
- (b) If the atmospheric pressure is 103000N/m^2 and the density of liquid L_2 is 103kg/m^3 determine the pressure acting at point A. (3 marks)

SECTION B (55 MARKS)

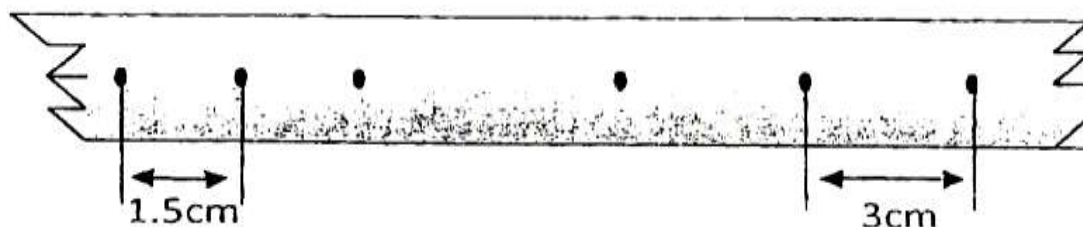
Answer all questions in this section

12. (a) The velocity-time graph in the figure below illustrates the motion of a ball which has been projected vertically upwards from the surface of the moon. The weight of the object on earth's surface is 20N, when the acceleration due to gravity is 10ms^{-2} .



- (i) State why the velocity becomes negative after 3 seconds. (1 mark)
- (ii) Determine the acceleration of free fall on the moon showing clearly your work. (1 mark)
- (iii) Determine the total distance traveled by the ball in 1.0 sec (2 marks)
- (iv) Find the weight of the ball on the moon (2 marks)
- (v) If the ball was projected vertically upwards on the earth with the same velocity. What difference would you expect to observe in the velocity-time graph above? Illustrate with a sketch on the same axis. (1 mark)

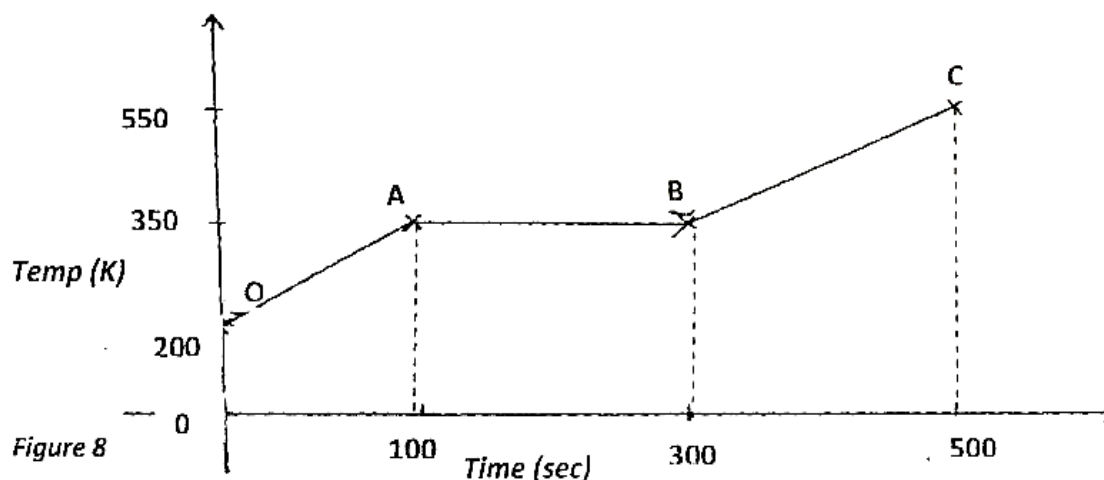
- (b) The figure below represents part of a tape pulled through the ticker-timer of frequency 50Hz moving down an inclined plane.



If the trolley was allowed to move down the inclined plane for 4 seconds. Calculate the distance it covers. (3 marks)

13. a) State two differences between boiling and evaporation. (2 marks)

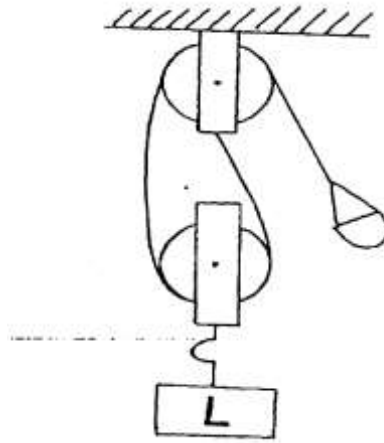
(b) 200g of a solid was uniformly heated by a 0.2kw heater for sometime. The graph in the figure below shows how the temperature of the solid changed with time.



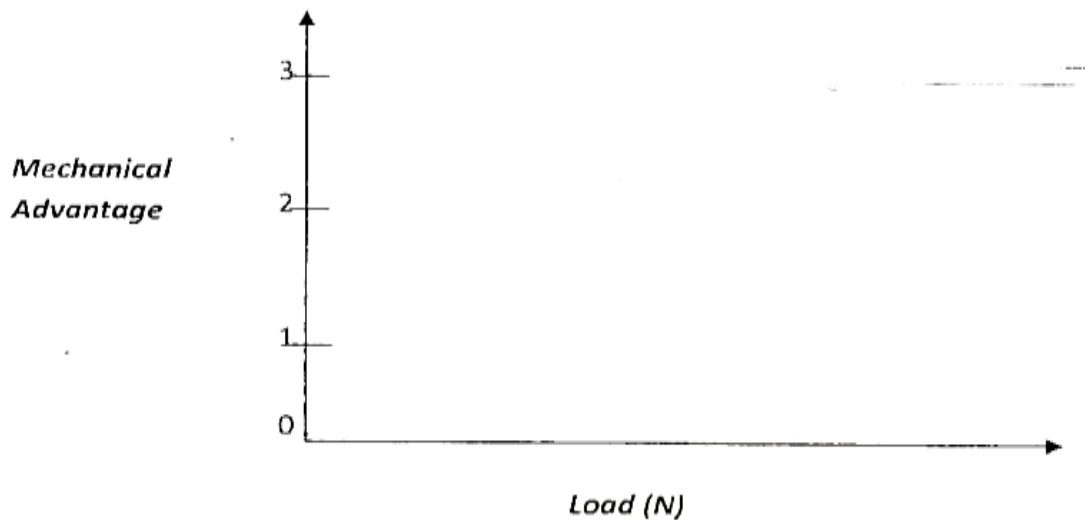
- (i) Explain what is happening between OA and AB. (2 marks)
 (ii) Calculate the specific heat capacity of the solid. (3 marks)
 (iii) Calculate the specific latent heat of fusion k of the solid. (3 marks)

14. (a) (i) Define the term velocity ratio (V.R) (1 mark)
 (ii) Name one machine that has a velocity ratio of less than one (V.R < 1) (1 mark)

(b) The figure below shows a set-up used to find the mechanical advantage of a pulley system\



On the axes provided sketch a graph of mechanical advantage (M.A) against load (L) (2 marks)



(c) A hydraulic machine is used to raise a load of 100kg at a constant velocity through a height of 2.5m. The radius of the effort piston is 1.4cm while that of the load piston is 7.0cm. given that the machine is 80% efficient, calculate: -

(i) The effort needed (3 marks)

(ii) The energy wasted when using the machine (3 marks)

15. a) Define pressure and state its S.I Units. (2 marks)

b) State Pascal's principal. (1 mark)

c) In construction of a mercury barometer care is taken to make sure it has no gas in the space above mercury.

i) How would you test whether there is gas above? (1 mark)

ii) State the problem caused by the presence of gas in the barometer. (1 mark)

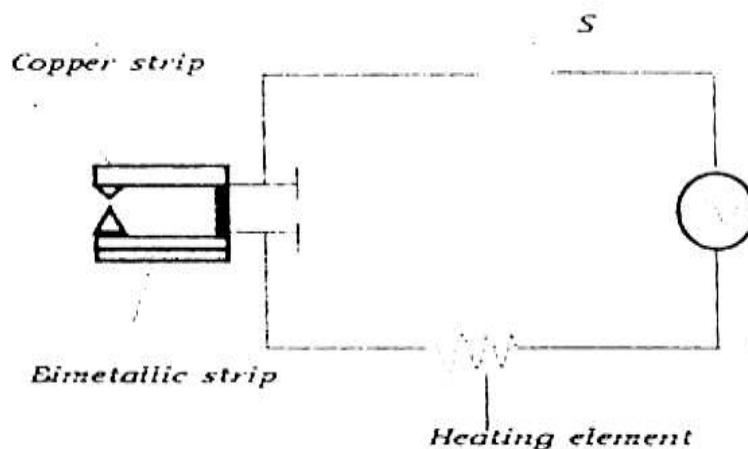
d) Find the total pressure experienced by a diver 8 meters below the sea surface.

Take; Atmospheric pressure = $103\,360\text{N/m}^2$. Density of sea water 1030kg/m^3 **(3 marks)**

e) i) The air pressure at the base of a mountain is 75.0cm of mercury while at the top it is 60.0cm of mercury. Given that the average density of air is 1.25kgm^{-3} and the density of mercury is 13600kgm^{-3} , calculate the height of the mountain.

ii) State factors that affect pressure due to liquid column. **(2 marks)**

16. a) The figure below shows a circuit diagram for a device for controlling the temperature in a room.



i) Explain the purpose of the bimetallic strip. **(2 marks)**

ii) Describe how the circuit controls the temperature when the switch is closed. **(2 marks)**

b)(i) Explain why bodies in circular motion undergo acceleration even when their speed is constant. **(1 mark)**

(ii) A particle moving along a circular path of radius 5cm describes an arc of length 2cm every second. Determine:

a. Its angular velocity **(2 marks)**

b. Its periodic time. **(2 marks)**

(iii) A stone of mass 40g is tied to the end of a string 50cm long and whirled in a vertical circle at 2rev/s. Calculate the maximum tension in the string. **(3 marks)**

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 5**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- Write your **name** and **index number** in the spaces provided above.
- Sign and write the **DATE** of examination in the spaces provided above.
- This paper consists of **TWO** sections: **A** and **B**.
- Answer **ALL** the questions in sections **A** and **B** in the spaces provided.
- **ALL** working **MUST** be clearly shown.
- Non-programmable silent electronic calculators and KNEC mathematical tables may be used.

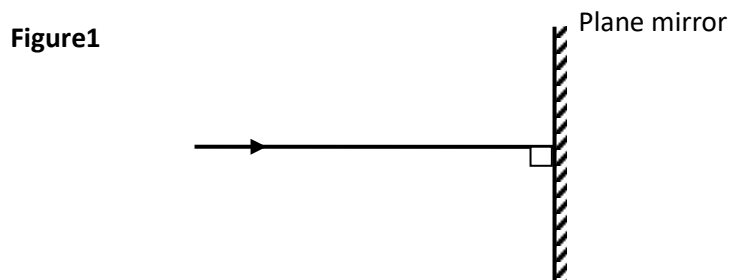
For Examiner's Use Only

Section	Question	Maximum Score	Candidates Score
A	1 - 12	25	
B	13	9	
	14	8	
	15	11	
	16	10	
	17	8	
	18	9	
	Total Score	80	

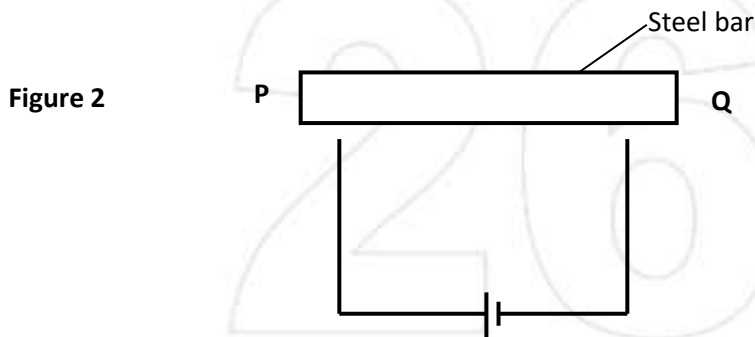
SECTION A (25 MARKS)

Answer ALL the questions

1. **Figure 1** show a ray of light incident on a plane mirror.

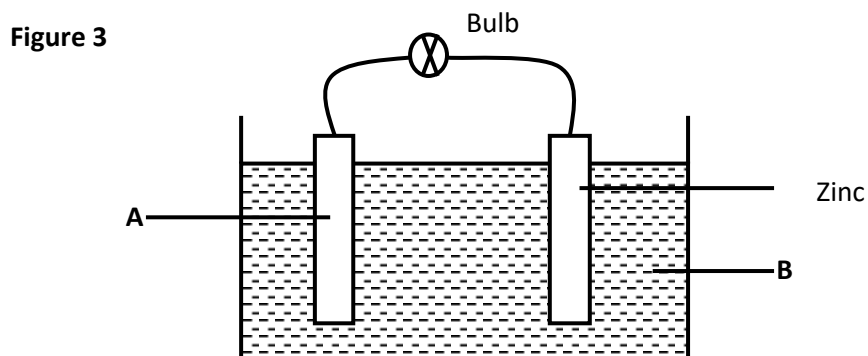


- (a) On the diagram, indicate the direction of the reflected ray. **(1mark)**
 (b) Give reason for the path shown above. **(1mark)**
2. State what happens to the image when one moves closer to the object when using a pinhole camera. **(1mark)**
3. An object of height 2 cm is placed 25 cm in front of a concave mirror. A real image is formed 75 cm from the mirror. Calculate the height of the image. **(2marks)**
4. State the law of magnetism. **(1mark)**
5. State and explain the functions of the keeper when storing magnets. **(2marks)**
6. **Figure 2** shows a steel bar to be magnetized.



Complete the circuit such that both poles **P** and **Q** acquire opposite polarity (North- south respectively). **(1mark)**

7. **Figure 3** shows a set up of a simple cell.



- (a) Name the electrode **A** and electrolyte **B**. (2marks)
- (b) State **two** reasons why the bulb goes off a short time. (2marks)
- (c) Give **one** method of minimizing the defect that occurs in plate **A**. (1mark)

8. The chart below shows part of the electromagnetic spectrum.

A	B	Visible light	UV light	C
----------	----------	---------------	----------	----------

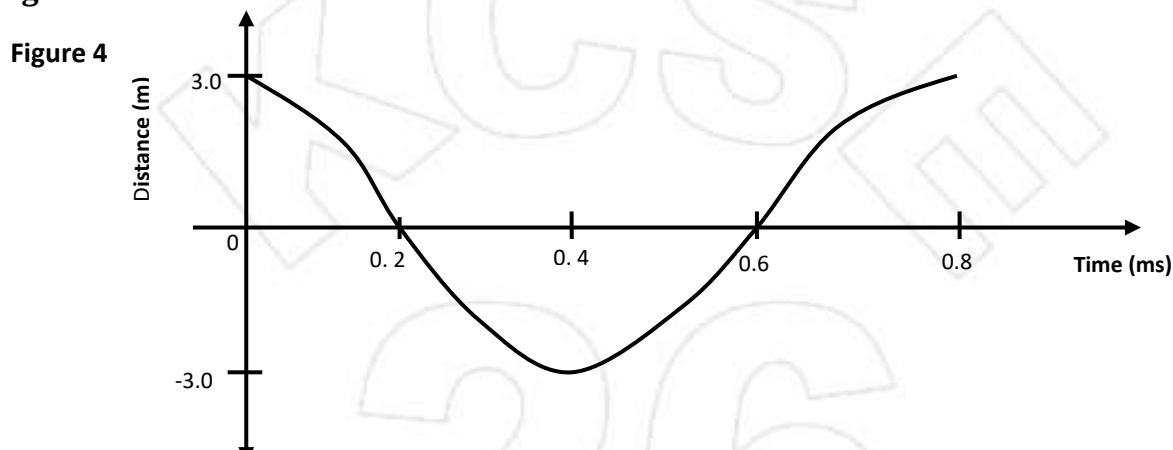
(a) Identify the radiation marked A and C. (1mark)

(b) Give **one** application of the radiation marked B. (1mark)

9. The range of audible frequencies varies from 20 Hz to 20 kHz. If the speed of sound is 340 m/s, what is the corresponding range of wavelength? (3marks)

10. Distinguish between transverse waves and longitudinal waves. (1mark)

11. Figure 4 shows a wave form



Determine the wavelength given that the speed of the wave is 400 m/s. (2marks)

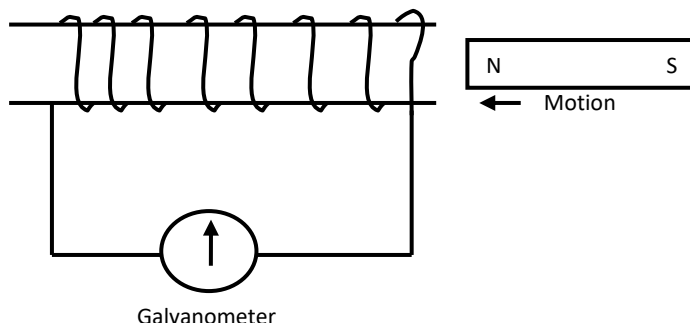
12. An electric kettle is rated at 1.8 kW, 240 V. Explain the choice of the safest fuse for the kettle. (the available fuses are 5 A, 10 A, and 20 A) (3marks)

SECTION B (55 MARKS)

Answer ALL the questions in the spaces provided.

13.(a) A bar magnet is pushed into a coil as shown in Figure 5 below

Figure 5



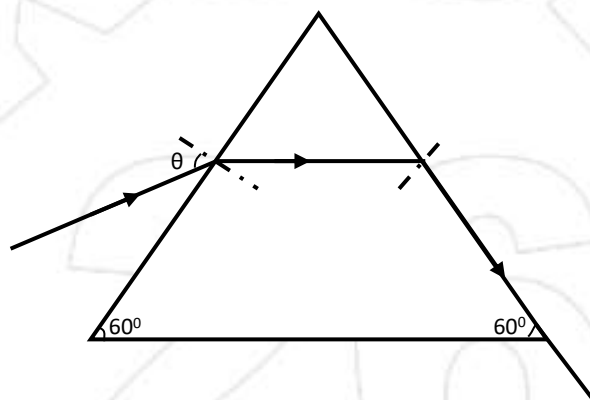
Explain what happens to the pointer of the galvanometer when the magnet is:

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- (i) Moved into the coil rapidly? (1mark)
- (ii) Remains stationary inside the coil? (1mark)
- (b) State **two** ways of increasing the magnitude of induced current in a generator. (2marks)
- (c) A transformer has 200 turns in the primary coil and 1000 turns in the secondary coil. The primary coil is connected to an a.c source producing 100 V and rated 500 W. The current delivered by the secondary circuit was found to be 0.95 A.
- (i) Determine the efficiency of this transformer. (3marks)
- (ii) Explain why the efficiency is less than 100%. (2marks)

14. (a) A coin is placed at the bottom of a tall jar. The jar is filled with paraffin to a depth of 32.4 cm and the coin is apparently seen displaced 9.9 cm from the bottom. Determine the refractive index of air with respect to paraffin. (3marks)
- (b) Define the term **critical angle**. (1mark)
- (c) **Figure 6** shows a ray of light passing through a glass prism.

Figure 6

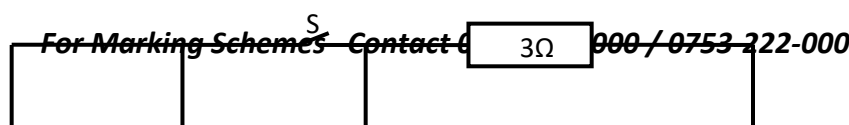


If the speed of light in prism is $2.0 \times 10^8 \text{ m/s}$

- (i) Determine the refractive index of the prism material given that the speed of light in air is $3.0 \times 10^8 \text{ m/s}$. (2marks)
- (ii) Determine the value of the critical angle c and show it on **Figure 6**. (2marks)
- (a) Differentiate between an Ohmic and non-ohmic conductor giving **one** example in each case (2marks)

- (b) **Figure 7** shows a circuit with resistors and voltmeter connected to a battery.

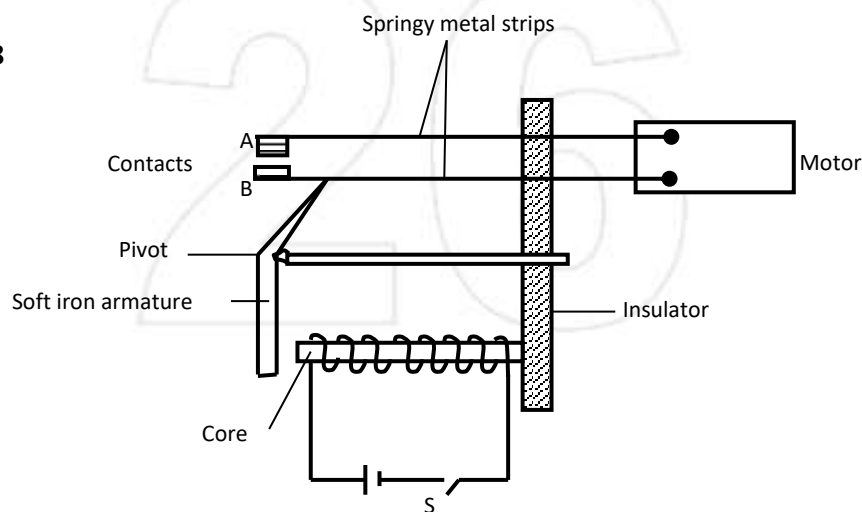
Figure 7



- (i) If each cell has an internal resistance of 0.7Ω , determine the total resistance in the circuit. (3marks)
- (ii) What amount of current flows through the 3Ω resistor when the switch is closed? (3marks)
- (iii) What is the reading of the voltmeter when the switch S is
- (I) Open (1mark)
- (II) Closed (1mark)
- (iv) Account for the difference between the answers in (I) and (II) above. (1mark)

15. Figure 8 shows an electromagnetic relay being used to switch an electric motor on and off. The electromagnet consists of a coil of wire wrapped around a core. The motor in figure is switched off.

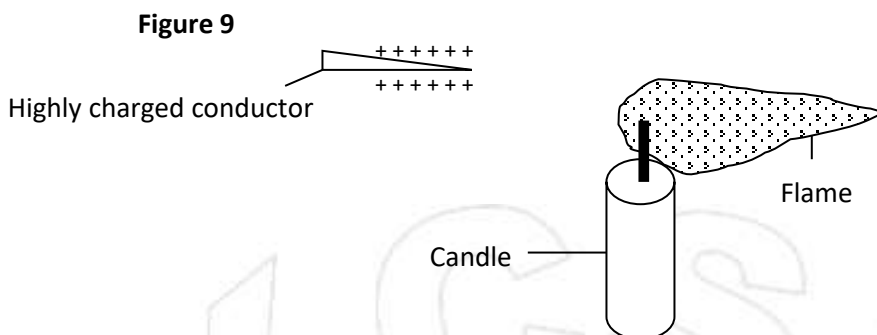
Figure 8



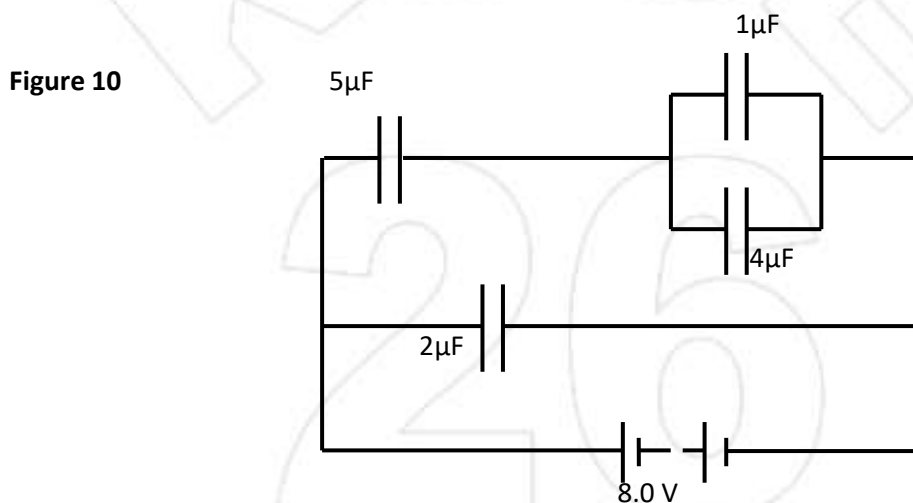
- (a) Suggest suitable material for the core. (1mark)
- (b) What happens to the core when switch S is closed? (2marks)
- (c) Why do the contacts A and B close when the switch S is closed. (2marks)
- (d) When the switch S is opened, what will happen to;
- (i) The core (1mark)
- (ii) Soft iron armature. (1mark)

- (e) Give **one** other application of an electromagnet. (1mark)
- (f) State **two** ways in which an electromagnet could be made more powerful. (2marks)

16. (a) Give a reason why a candle flame is blown when a highly charged conductor is brought close to it as shown in **Figure 9**. (2marks)



- (b) **Figure 10** shows $1\mu\text{F}$, $2\mu\text{F}$, $4\mu\text{F}$ and $5\mu\text{F}$ capacitors connected to a battery.



Determine:

- (i) The total capacitance. (2marks)
- (ii) The total charge. (2marks)
- (iii) Voltage across the $4\mu\text{F}$ capacitor. (2marks)

17. (a) In an experiment to observe interference of light a double slit experiment was placed close to the monochromatic source as shown in **Figure 11**.

Figure 11

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(i) State the function of the double slit. (1mark)

(ii) Describe what is observed on the screen. (2marks)

(b) Figure 12 shows an object O placed in front of a diverging lens whose principal focus is F.

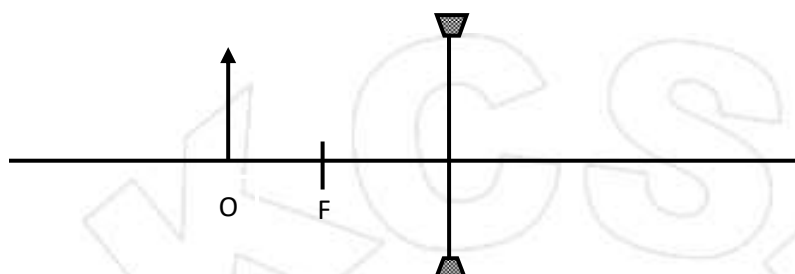
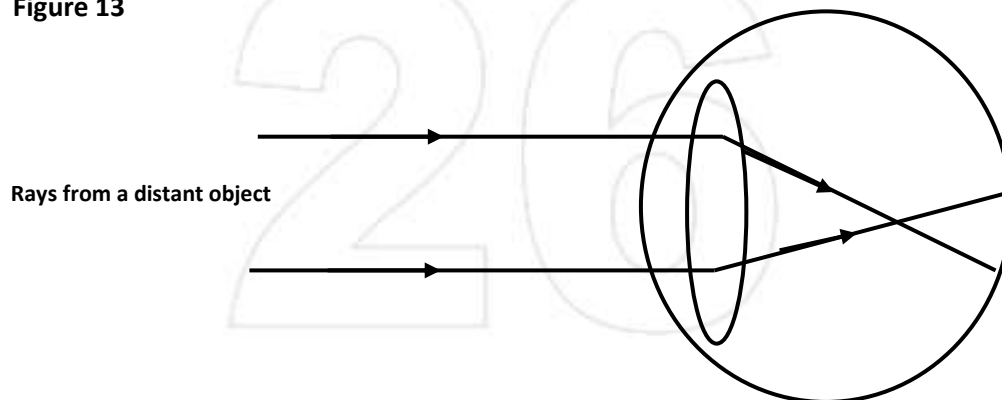


Figure 12

On the diagram, draw rays diagram to locate the image formed. (3marks)

(c) Figure 13 shows a defective eye focusing a distant object.

Figure 13



(i) Name the defect. (1mark)

(ii) On the same diagram, sketch the appropriate lens to correct the defect and sketch the rays to show the effect of the lens. (2marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 6**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- Write your **Name, Signature** and **Index Number** in the spaces provided above.
- This paper consists of **two** sections: **A** and **B**
- Answer all the questions in the spaces provided
- All working must be clearly shown.
- Mathematical tables and electronic calculators may be used **Take $g=10\text{ms}^{-2}$**
- **Density of mercury = 13600 kg/m^3**

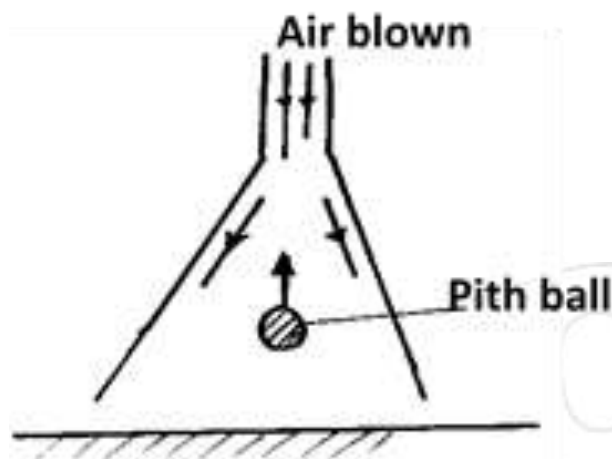
For Examiner's Use

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-13	25	
B	14	11	
	15	11	
	16	09	
	17	12	
	18	12	
TOTAL		80	

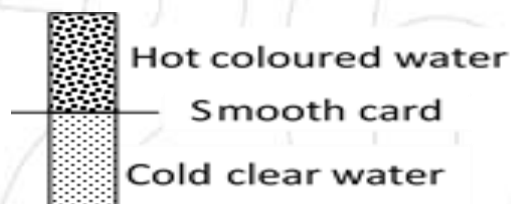
Section A (25 marks)**For Marking Schemes Contact 0746-222-000 / 0753-222-000**

Answer all the questions in the spaces provided

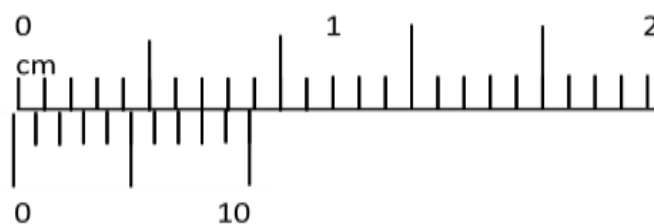
1. A partially inflated balloon at sea level becomes fully inflated at higher altitudes. Explain this observation (2 marks)
2. The figure below shows a pith ball being lifted into the funnel by blowing air into the funnel. Explain this observation (2 marks)



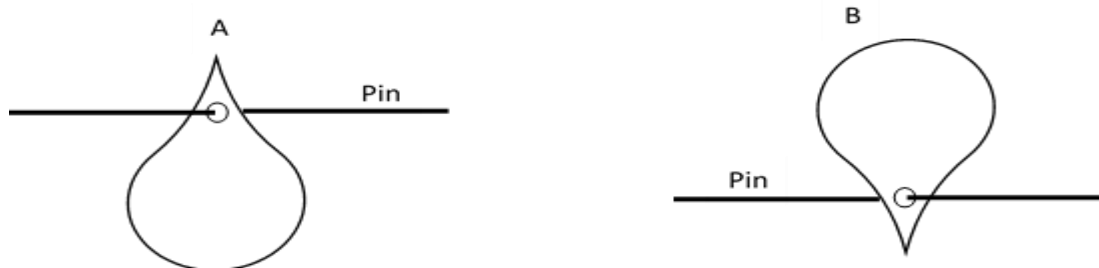
3. State **two** reasons why gases diffuse at a higher rate than liquids. (2 marks)
4. A student set up an experiment as shown below using two gas jars, one with hot coloured water, the other with cold clear water separated by a smooth card. The upper jar is upside down. Explain the observation made when the card is removed. (2 marks)



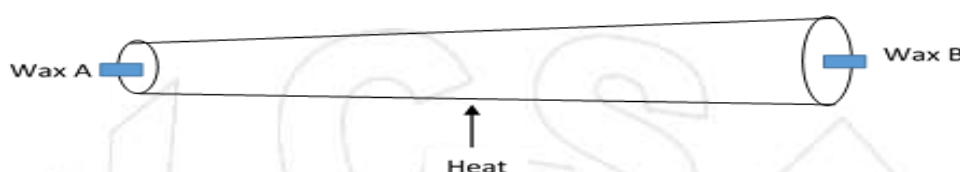
5. The figure below shows the scale of a Vernier calipers which is closed fully. State the Zero error of the instrument (1 mark)



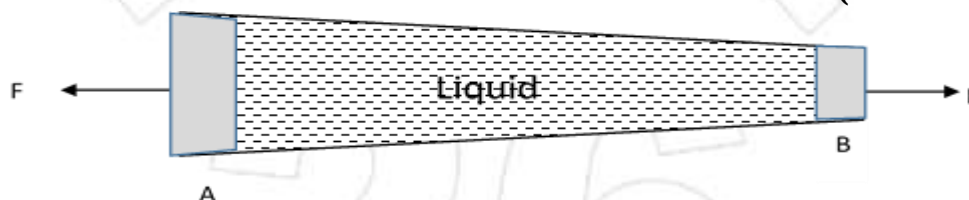
6. The figure below shows a uniform body suspended freely through a hole on an optical pin.
State with reason the case where the body is more **stable** (2 marks)



7. The figure below shows a metal being heater at the middle. Giving the reason state the wax that will fall off first (2 marks)



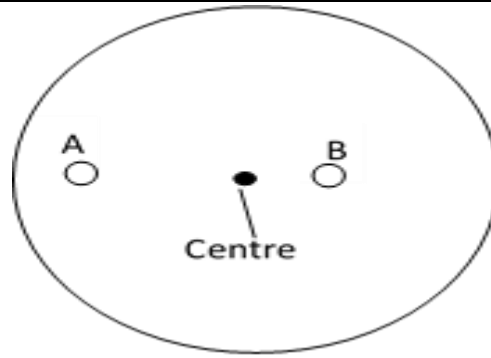
8. The figure below shows a system with a liquid enclosed by two pistons. Equal force F is applied on the system as shown. Giving reason show with an arrow the direction of movement of the liquid (2 marks)



- The figure below shows a bimetallic wheel whose diameter is not affected by changes in temperature. Briefly explain how the diameter of the wheel remain unchanged as the temperature increases. (2 marks)



9. Two identical springs have a combined spring constant of 3.5N/cm when in series Determine combined spring constant when the springs are in parallel. (2 marks)
10. Two coins A and B of the same mass and material are placed on a turntable as show below. The turntable is then rotated at a high speed. With reason name the coin that skids first (2 mk)

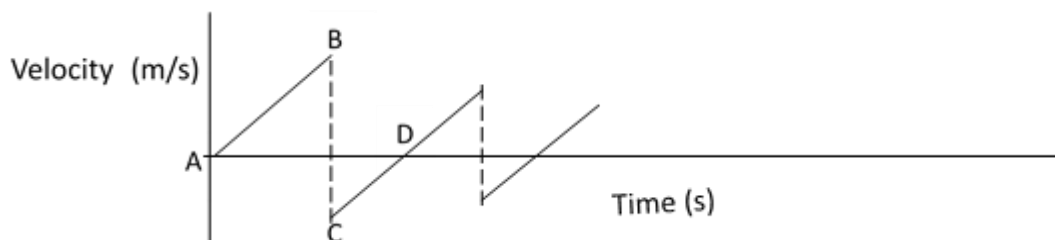


11. A substance of volume $X\text{cm}^3$ and density 800kgm^{-3} is mixed with 100cm^3 of water of density 1000kgm^{-3} . The density of the mixture is 960kgm^{-3} . Determine the value of X. (2 marks)
12. A bullet of mass 10g travelling at a speed of 400ms^{-1} hits a tree trunk. It penetrates the tree trunk and stops inside the trunk after 4 cm . Calculate the average resistance force offered by the trunk to the bullet. (2 marks)

Section B (55 marks)

Answer all the questions in the spaces provided

13. (a) A body accelerates from rest. Its velocity after 5 seconds is 26m/s and after 9 seconds its velocity is 42m/s . calculate
- Distance moved during the motion (3 marks)
 - Average speed of the journey (2 marks)
- (b) A car can be brought to rest from a speed of 20m/s in a time of 2s when brakes are applies.
- Find the average deceleration (1 mark)
 - The car is stopped by a policeman when moving at a speed of 20m/s . If the driver's reaction time is 0.2s determine the shortest stopping distance. (2 marks)
- (c) The figure below shows the graph of a tennis ball bouncing severally on a table



Describe the motion between

- AB (1 mark)
- BC (1 mark)

iii. CD
(1 mark)
14. (a) State the Pascal principle
(1 mark)
(b) State the principal of moments
(1 mark)

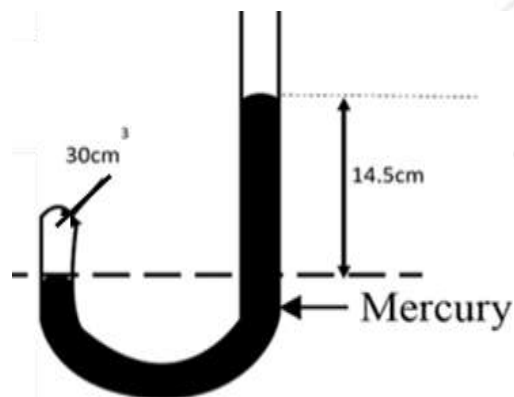
(c) The figure below shows a 100cm uniform bar of weight 50N balanced horizontally on two pistons.



Correct to 2 decimal places determine

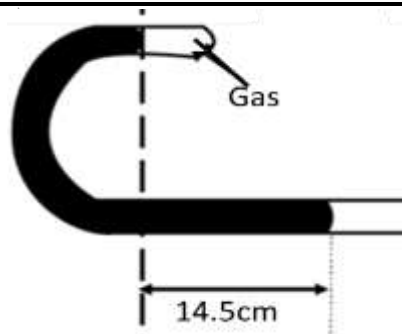
i. Force exerted on piston A
(3 marks)
ii. Force exerted on Piston B
(3 marks)
iii. Cross section area of piston A
(3 marks)

15.a. The figure below shows 30cm^3 of gas trapped in a tube containing mercury to a height of 14.5cm. The prevailing atmospheric pressure is 760mmHg. Determine the pressure acting on the gas in Pascals

(3 marks)


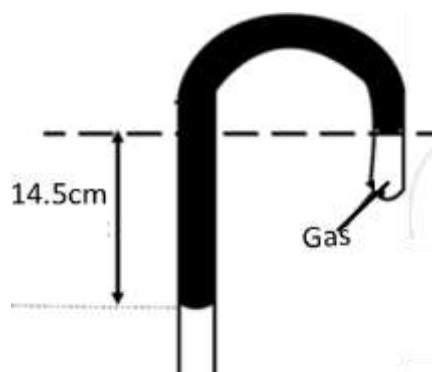
b. Determine the volume of the gas when the tube is held as shown below

i.
(3 marks)



ii.

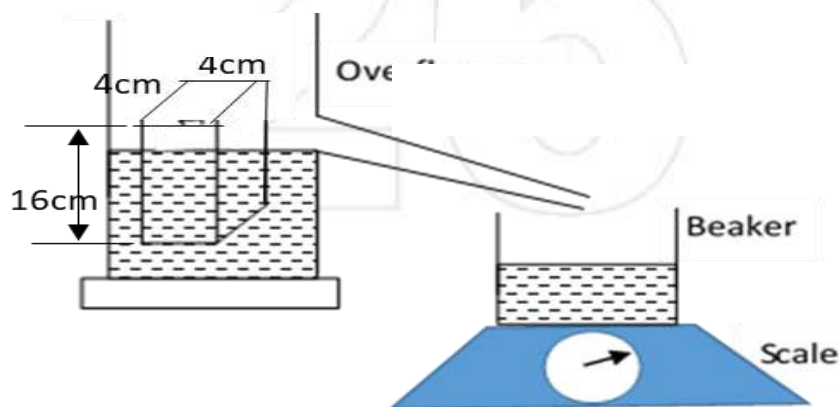
(3 marks)



16.a) State the law of floatation.

(1 mark)

b) The figure below shows a block cuboid of dimensions 4cm by 4cm by 16cm floating in a liquid in an overflow can with $\frac{3}{4}$ of its height submerged.



Given that the mass of the beaker when empty is 85g and the reading on the scale in the set up above is 245g, calculate:

(i) The density of the block.

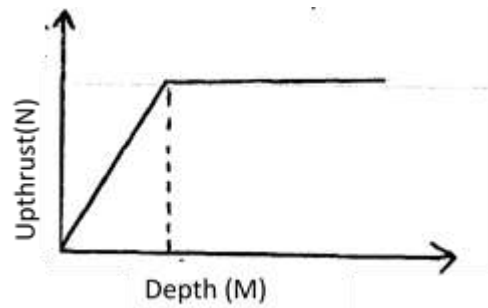
(3 marks)

(ii) The density of the liquid.

(2 marks)

(c) A metal block is suspended from a spring balance and held inside a beaker without

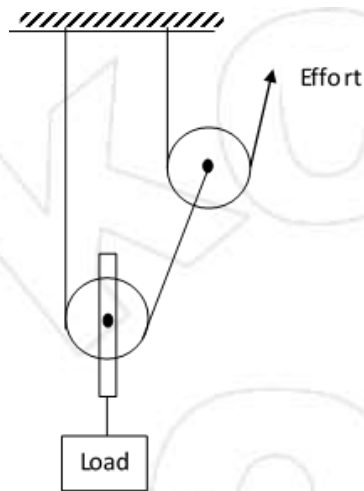
touching the beaker. Water is added gradually into the beaker. The graph below shows the variation of up thrust on the block with depth of water.



Explain the shape of the graph.

(2 marks)

(d) The figure below shows a pulley system being used to raise a load.



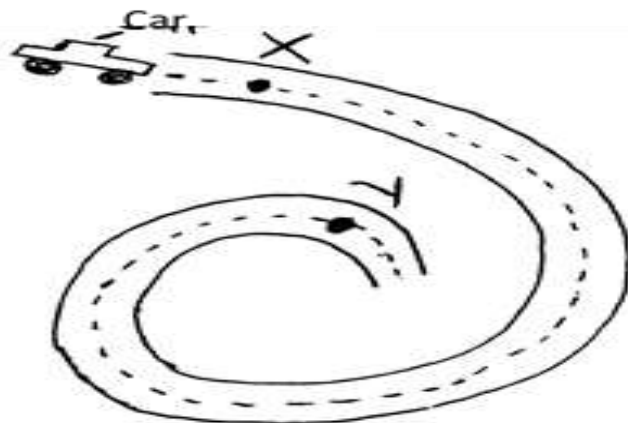
(i) Indicate the direction of the strings

(1 mark)

(ii) If an effort of 35N raises a load of 105N, determine the efficiency of the system.

(3 marks)

18. (a) The figure below shows a car of mass (m) moving along a curved part of the road with a constant speed.



(i) Explain why the car is more likely to skid at Y than at X.

(2 marks)

(ii) If the radius of the road at V is 250m and the car has a mass of 600kg, determine the maximum speed at which the car can be driven while at V without skidding. Force of friction between the road and the tyres is 18000N. **(3 marks)**

(b) A string of length 70cm is used to whirl a stone in a circle in a vertical plane at 5 rev/s. Determine:

(i) The period **(1 mark)**

(ii) The angular velocity. **(2 marks)**

(iii) The speed of the stone **(2 marks)**

(a) A body moving in a circle with constant speed is said to have an acceleration. Explain.

(1 mark)

KCSM
2026

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 6**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTION TO CANDIDATES**

- (a) Write your **name, index number** in the spaces provided.
- (b) This paper consists of **TWO** sections: **A** and **B**.
- (c) Answer **ALL** questions in section A and B in the spaces provided.
- (d) **ALL** workings **MUST** be clearly shown.
- (e) Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY

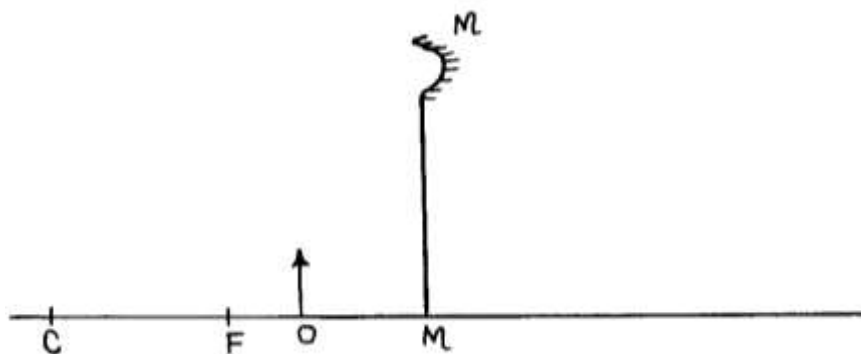
Section	Question	Maximum score	Candidate's score
A	1 – 12	25	
B	13	16	
	14	14	
	15	14	
	16	11	
	Total	80	

Answer ALL questions in section A and B

1. The figure below shows an object O in front of a curved mirror M.

a) On the figure, locate the image formed.

(3 marks)



2. State **two** ways of decreasing the strength of an electromagnet.

(2 marks)

3. State **one** disadvantage of using a convex mirror as a driving mirror.

(1 mark)

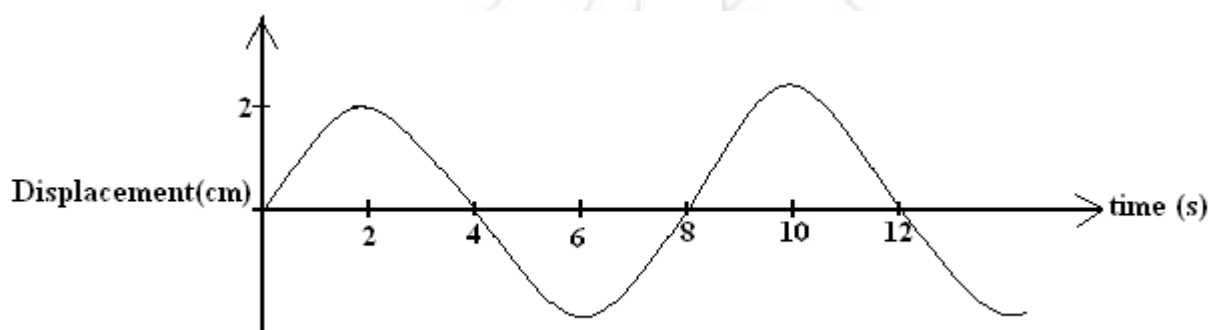
4. State **two** factors that affect the resistivity of an electrical conductor.

(2 marks)

5. A coin is placed at the bottom of a beaker containing a transparent liquid. When viewed from the top, the coin appears nearer the surface than it actually is. Explain the observation.

(2 marks)

6. The figure below shows a wave in progress.



Determine the

a) Amplitude

(1 mark)

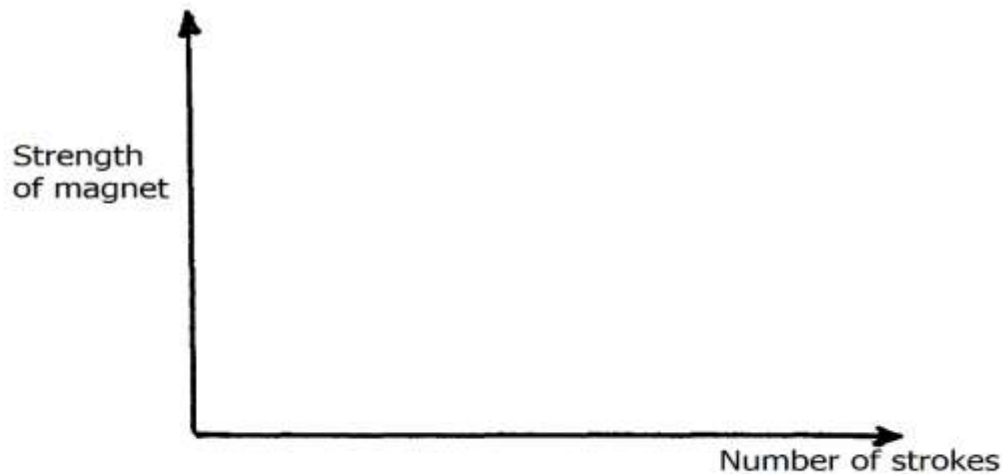
b) Frequency

(2 marks)

c) On the figure above, draw how the wave would appear if the period and amplitude is halved.

(1 mark)

8. A ferromagnetic material is being magnetized by single stroking method. On the axes provided, sketch a graph to show how the strength of the magnet being created varies with the number of strokes
(1 mark)



9. **Figure 4** shows a conductor carrying current placed in the magnetic field and moves in the direction shown

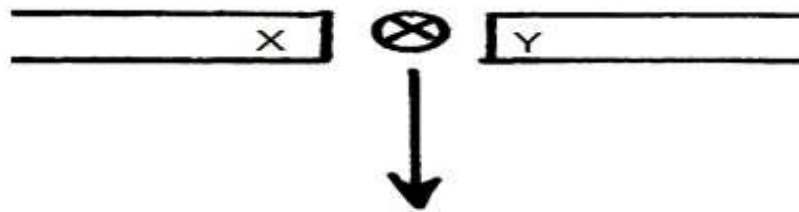


Figure 4

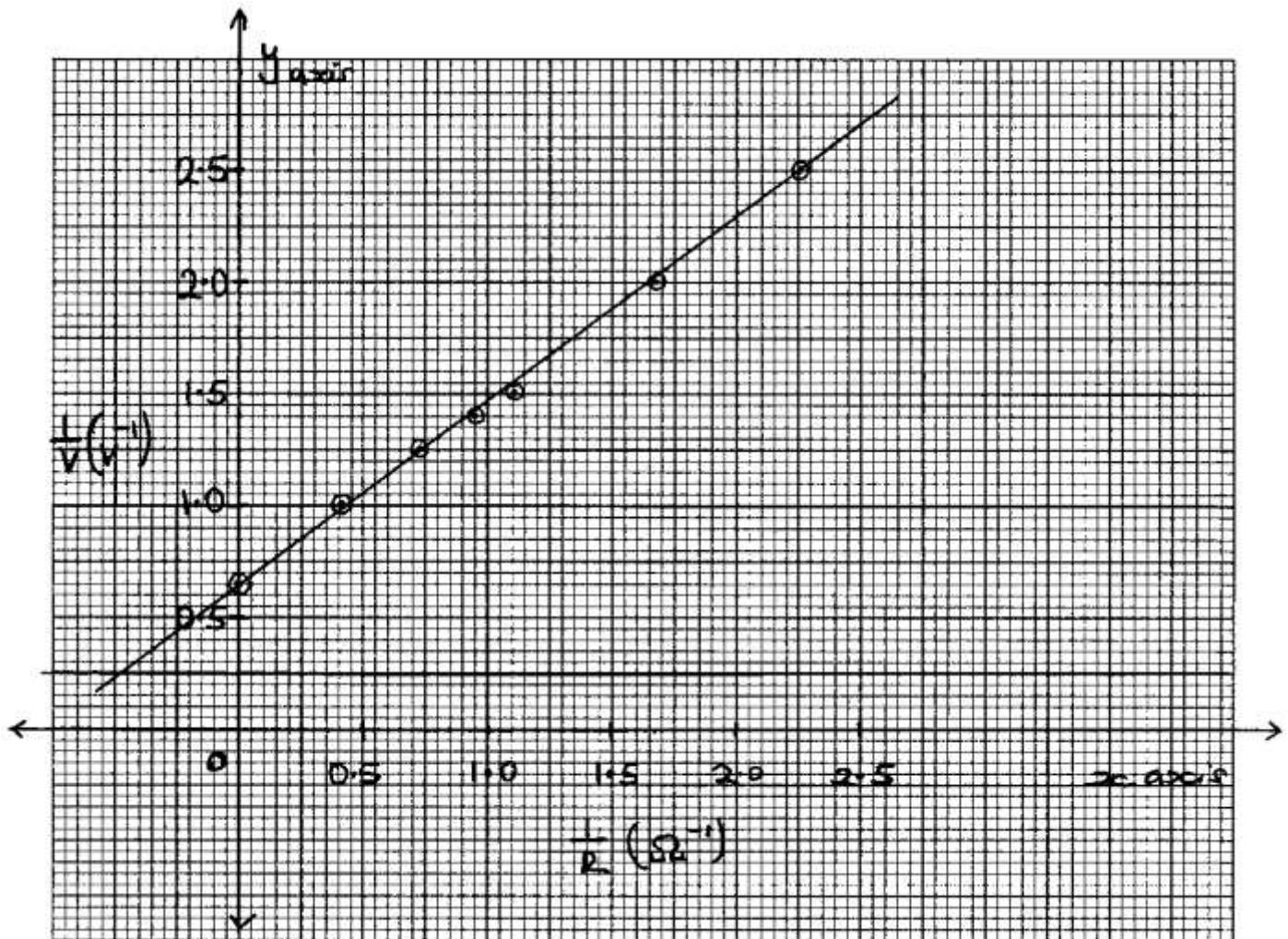
- Identify the polarities of **X** and **Y**. (2 marks)
10. A boy standing in front of a cliff blows a while and hears echo after 0.5s. He then makes 17metres further away from the cliff and blows the whistle again. He now hears the echo after 6.0 s. determined the speed of the sound. (3 marks)
11. (a) What is meant by the term electric current? (1 mark)
- (b) 0.25A of current passes through a point in a conductor in 3.5 minutes. Calculate the amount of charge passing through the point in this time. (2 marks)
12. An unmagnetized steel rod is clamped facing North-South direction and then hammered repeatedly for some time. When tested, it is found to be magnetized. Explain this observation (2 marks)

SECTION II (55 MARKS)

13. (a) State Ohm's law.

(1 mark)

b). The graph below shows results obtained in an experiment to determine the e.m.f.(E) and the internal resistance, r, of a cell.



Given that the equation of the graph is $\frac{E}{V} = \frac{r}{R} + 1$

Use the graph to determine the values of:-

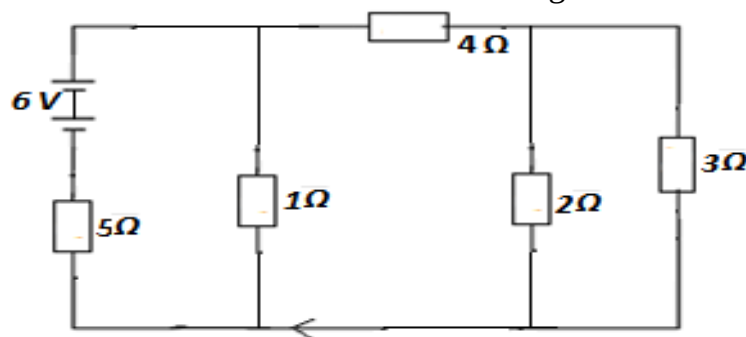
(i) E

(2 marks)

(ii) r

(3 marks)

c) The figure below shows five resistors and a source of voltage of 6V.



i) Find the effective resistance of the circuit.

(2 marks)

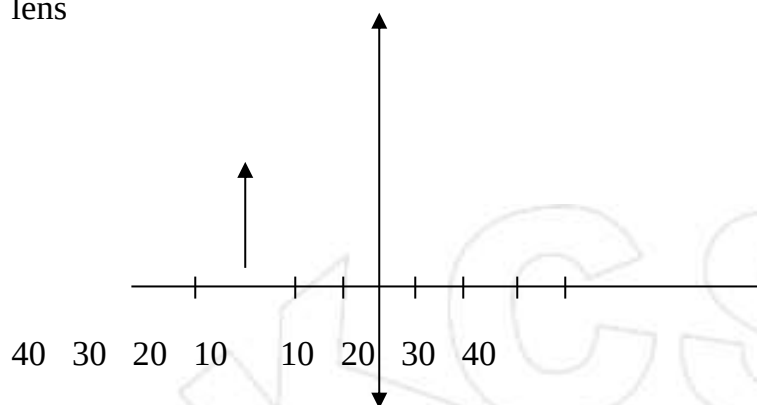
ii) Calculate the current through 5Ω . (3 marks)

(iii) What is the p.d across 2Ω . (3 marks)

iv) Calculate the current through 1Ω . (2 marks)

14. (a) An object is placed 30cm in front of a thin converging lens of focal length 20cm. The set up is represented in the figure.

lens



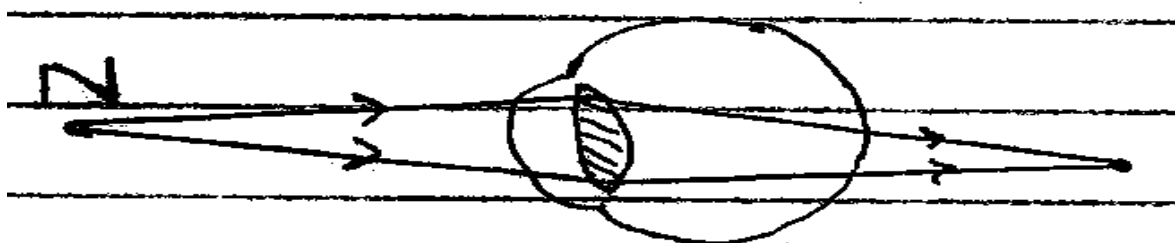
(i) On the same figure construct a ray diagram to locate the position of the image. (3 marks)

(ii) Determine the magnification produced. (2 marks)

(b) An object 6cm tall is placed 40cm from a convex lens of focal length 50cm. Find the position of the image. (3 marks)

(c) State **two** differences between the human eye and the camera. (2 marks)

(d) The figure below shows an eye defect.

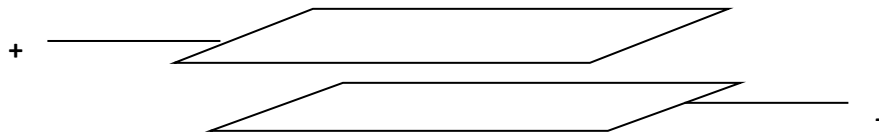


(i) Identify the defect. (1 mark)

(ii) State the cause of the defect. (1 mark)

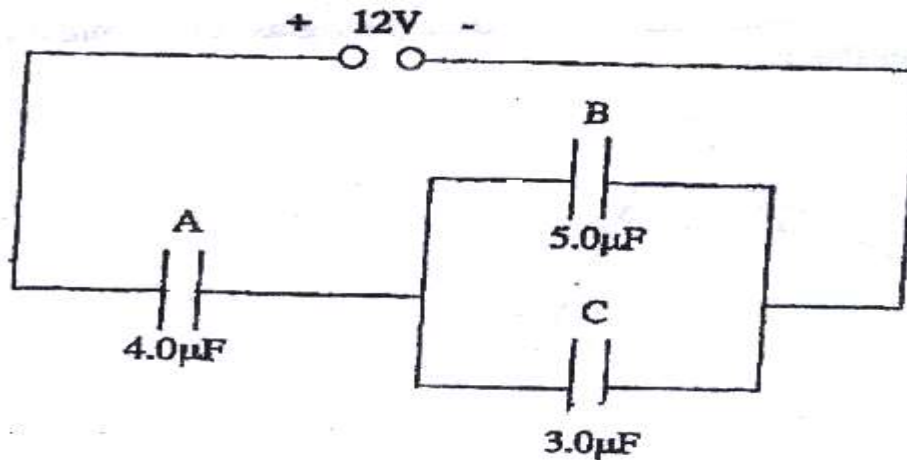
(iii) Using a well labeled diagram, illustrate how the defect is corrected. (2 marks)

15. (a) The figure below shows a pair of parallel plates of a capacitor connected to a Battery the upper plates is displaced slightly to the left.



State with reason the effect of this movement of the capacitance **(2 marks)**

- (b) The figure below shows an electrical circuit with three capacitors A, B and C of Capacitance $4.0\ \mu\text{F}$, $5.0\ \mu\text{F}$ and $3.0\ \mu\text{F}$ respectively connected to a 12V battery



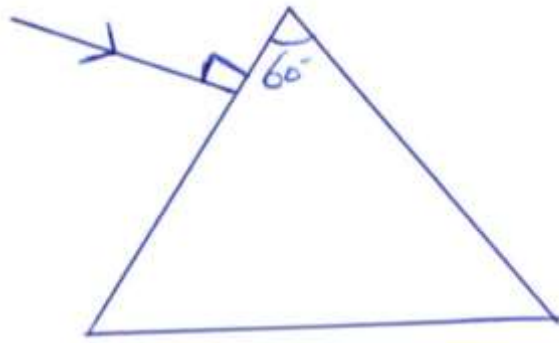
Determine:

- (i) The combined capacitance of the three capacitors **(3 marks)**
- (ii) The charge of the capacitor A **(2 marks)**
- (iii) The potential difference across the capacitor B **(2 marks)**

c) A positively charged sphere is suspended by an insulating thread. A negatively charged conductor is suspended near it. The conductor is first attracted, after touching the sphere it is repelled. Explain this observation. **(2 marks)**

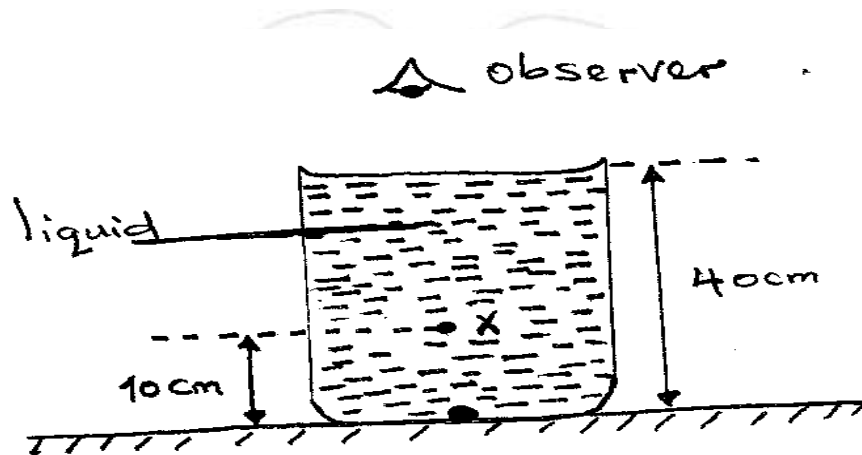
d) A $2\ \mu\text{F}$ capacitor is charged to a potential of 200V, the supply is disconnected. The capacitor is then connected to another uncharged capacitor. The p.d across the parallel arrangement is 80V. Find the capacitance of the second capacitor. **(3 marks)**

16. (a) A single ray of light is incident on an equilateral glass position as shown in the figure below. Complete the diagram to show the path of light through and out of the position. (critical angle of glass = 42°) **(3 marks)**



(b) State **two** (2) conditions necessary for total internal reflection (2 marks)

(c) (i) Figure below shows an object O at the bottom of a beaker full of a liquid. An observer above the beaker sees its image at point X inside a liquid.



Determine the refractive index of the liquid.

(3 marks)

(ii) Define the term critical angle(c) of a medium.

(1 mark)

(d) State **two** uses of optical fibre.

(2 marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 7**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***Instructions to candidates**

- (a) Write your name, index number in the spaces provided above.
- (b) Sign and write the date of the examination in the spaces provided
- (c) This paper consists of **TWO** Sections: **A** and **B**.
- (d) Answer **ALL** the questions in section **A** and **B** in the spaces provided.
- (e) KNEC mathematical tables and silent non-programmable electronic calculators may be used.

FOR EXAMINERS USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATES SCORE
A	1-13	25	
B	14	11	
	15	09	
	16	08	
	17	09	
	18	10	
	19	08	
	TOTAL SCORE	80	

SECTION A: 25MARKS

1. The figure below shows part of micrometer screw gauge with 50 divisions on the thimble scale.

Complete the diagram to show a reading of 5.73mm.

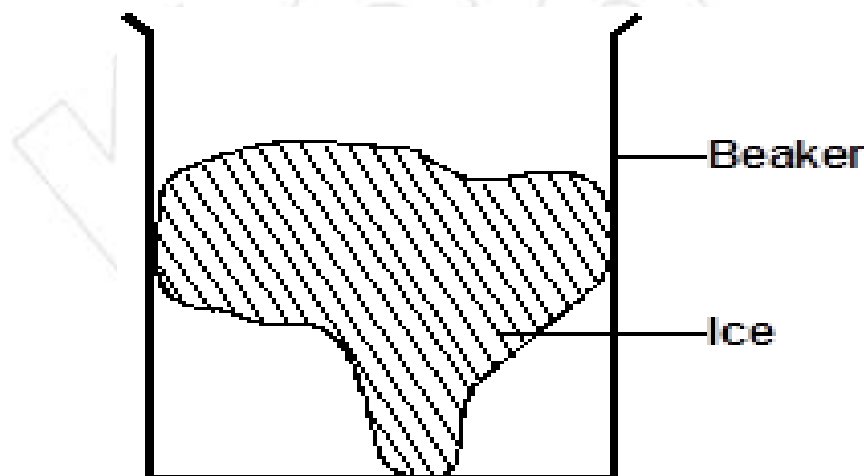
(2 marks)



2. A bottle containing a smelling gas is opened at the front bench of a classroom. State the reason why the gas is detected throughout the room.

(1 mark)

3. The figure below shows beaker containing a block of ice.



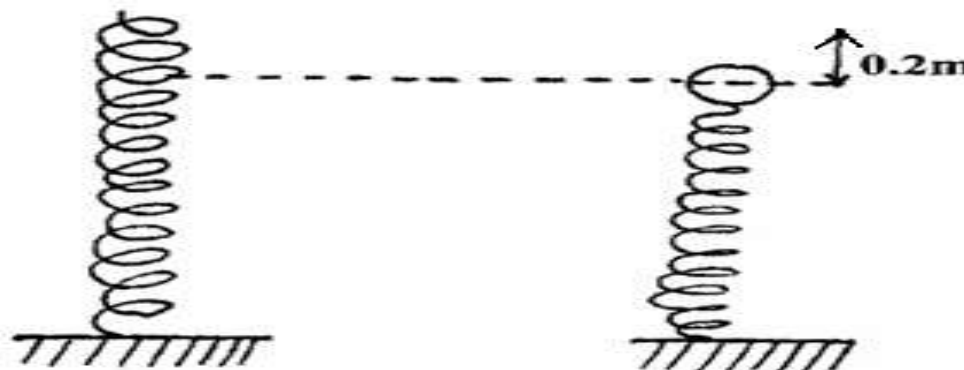
State and explain the change in stability when the ice melts.

(2marks)

4. An aero plane is moving horizontally through still air at a uniform speed. It is observed that when the speed of the plane is increased, its height above the ground increases. State the reason for this observation.

(2 marks)

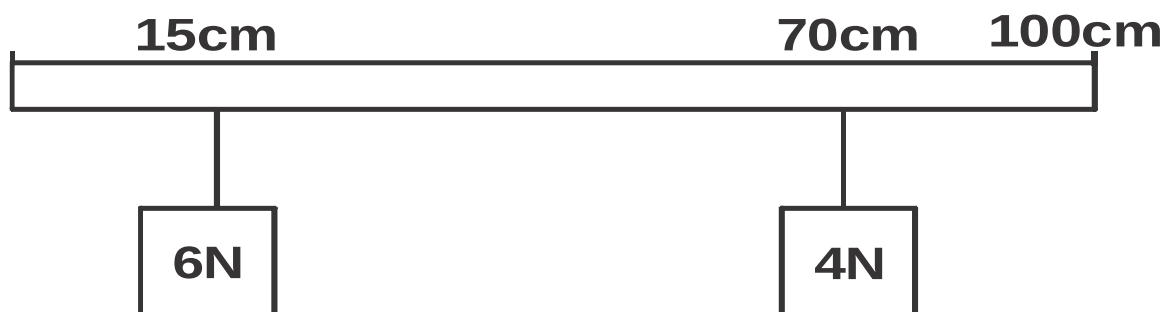
5. A steel ball of mass 0.05kg was placed on top of a spring on a level ground. The spring was then compressed through a distance of 0.2m.



If the spring constant is 15N/m . Calculate the maximum height reached when the spring is released.

(3marks)

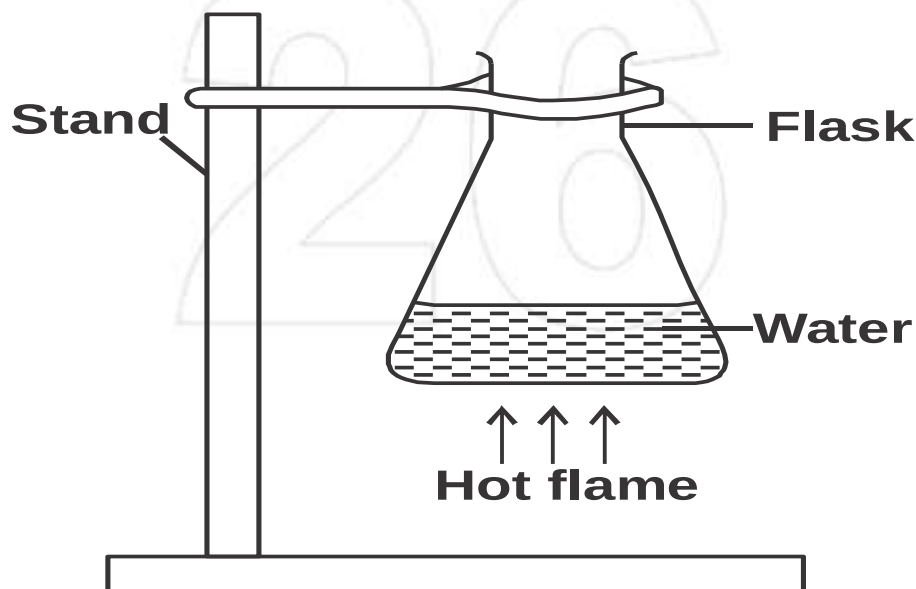
6. The figure below shows a uniform metre rule of weight 3N supporting two weights. The metre rule is pivoted somewhere such that it is horizontally balanced. (Pivot not shown)



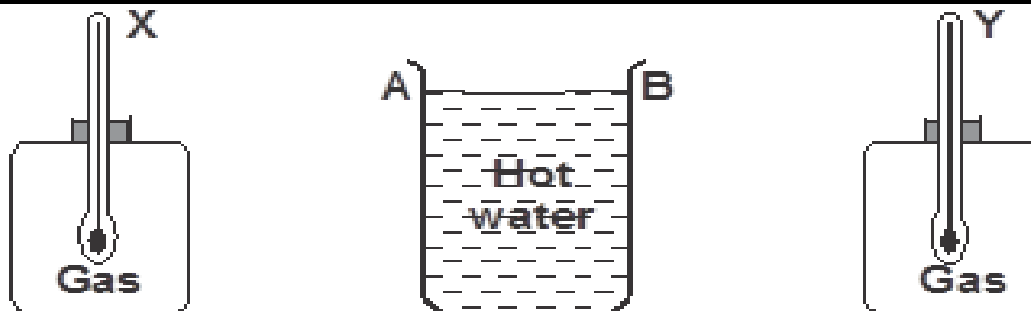
The 6N weight is at 15cm mark while the 4N weight is at 70cm mark. Determine the position of the pivot from zero cm mark. **(3 marks)**

7. State one environmental hazard that may occur when oil spills over a large surface area of the sea. **(1mk)**

8. The figure shows a flat bottomed flask containing some water. It is heated directly with a very hot flame. Explain why the flask is likely to crack. **(2marks)**



9. The figure below shows a cylindrical container having hot water at 95°C . End A is shiny while end B is dull black. At equal distances from the container is placed two identical gas jars fitted with thermometers X and Y.



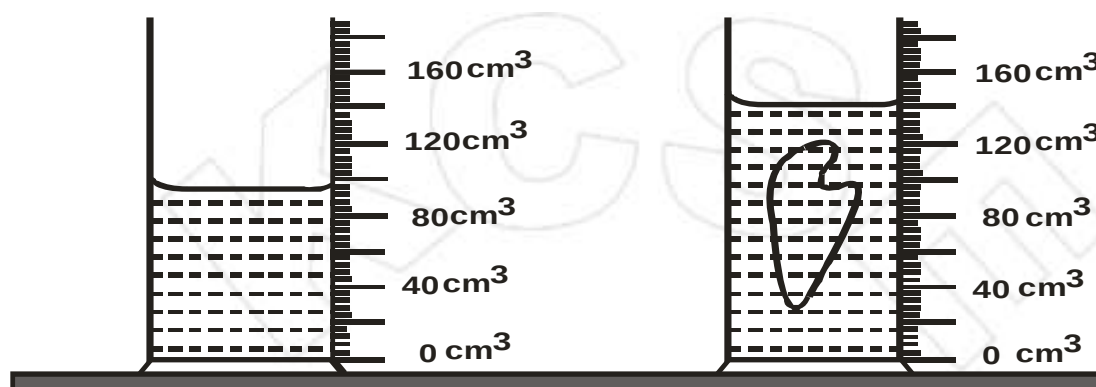
Compare the readings of the two thermometers after two minutes

(1 mark)

10. Give a reason for your answer in question 9 above

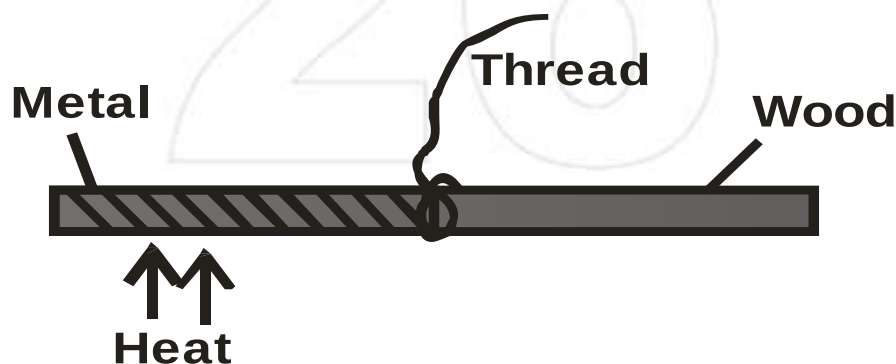
(1 mark)

11. The figure below shows the change in volume of water in a measuring cylinder when an irregular solid is immersed in it.



Given that the mass of the solid is 268g, determine the density of the solid in SI units. (3 marks)

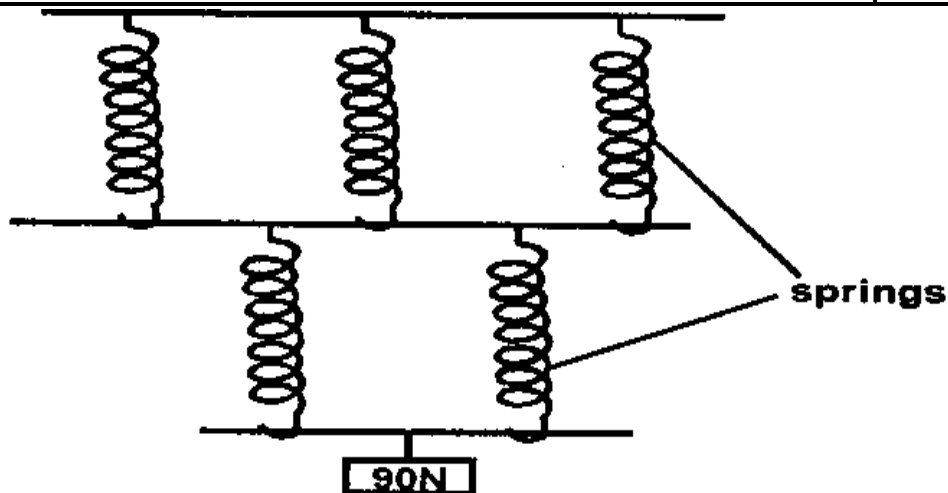
12. The following figure shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium.



The side made of metal is now heated with a Bunsen flame. State with a reason, the side to which the rod is likely to tilt

(2 marks)

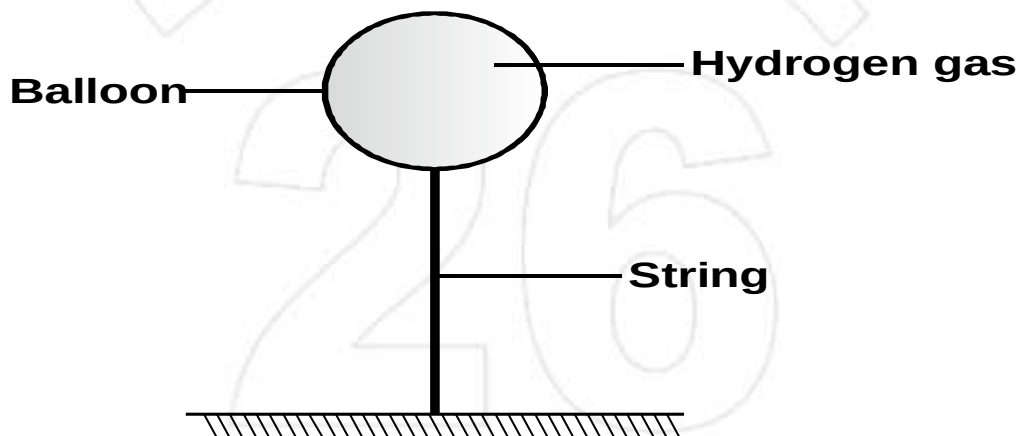
13. The spiral springs shown in the figure below are identical. Each spring has a spring constant, $k = 300\text{N/m}$



Determine the total extension of the system. (Take the weight of the cross bars to be negligible)
(2 marks)

SECTION B: 55MARKS

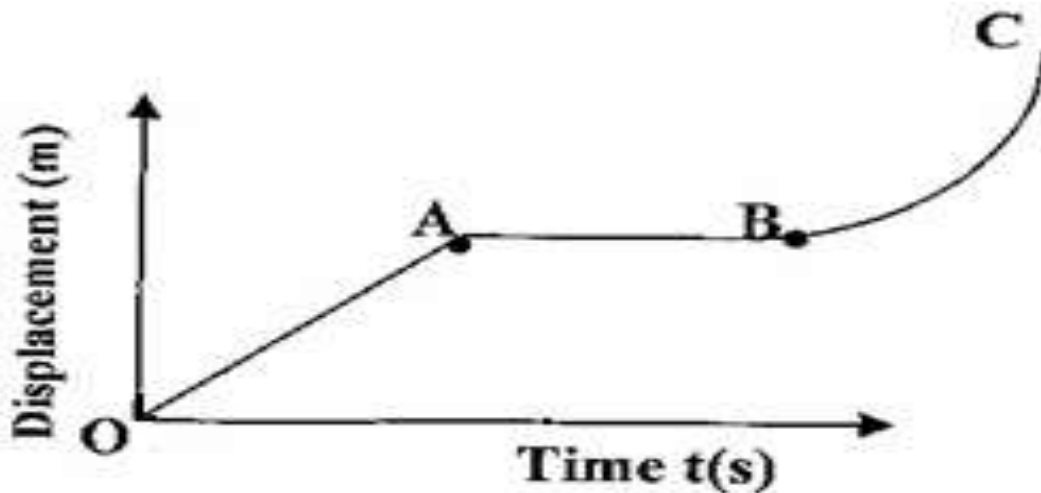
14. (a) State the Archimedes principle. (1 mark)
- b) A rubber envelope of a hydrogen filled balloon having volume of 2m^3 is held in position by a vertical string as shown below.



The mass of the balloon is 1.3kg . Given that density of hydrogen is 0.1kg/m^3 density of air is 1.3kg/m^3 . **Calculate;**

- (i) the total weight of the balloon including the hydrogen gas. (2 marks)
- (ii) the up thrust. (2 marks)
- (iii) the tension in the string. (2 marks)
- (c) A solid weighs 50N in air and 44N when complete immersed in water. Calculate
- i) Relative density of the solid. (2 marks)
- (ii) Density of the solid. (2 marks)

15.a) The figure below shows a displacement-time graph of the motion of a particle.



Describe the motion of the particle in the region.

(3marks)

OA

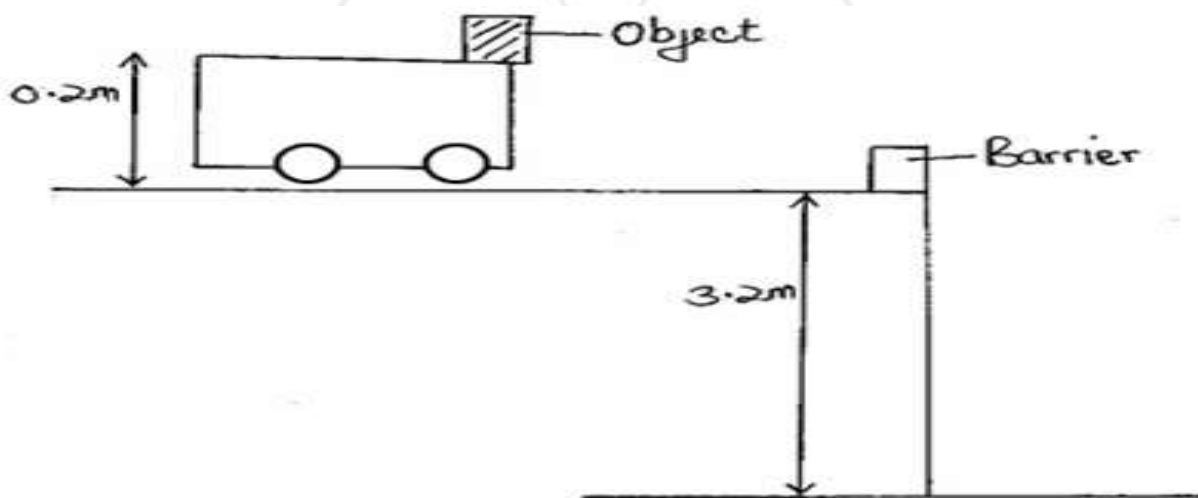
AB

BC

(b) State the Newton's first law of motion.

(1 mark)

c) The figure below shows a trolley moving towards a barrier at a constant velocity of 20m/s. Use this information to answer the questions that follows.



i) Sketch the path followed by the object after the impact

(1mark)

ii) Give a reason why the object on the trolley flies off on impact.

(1 mark)

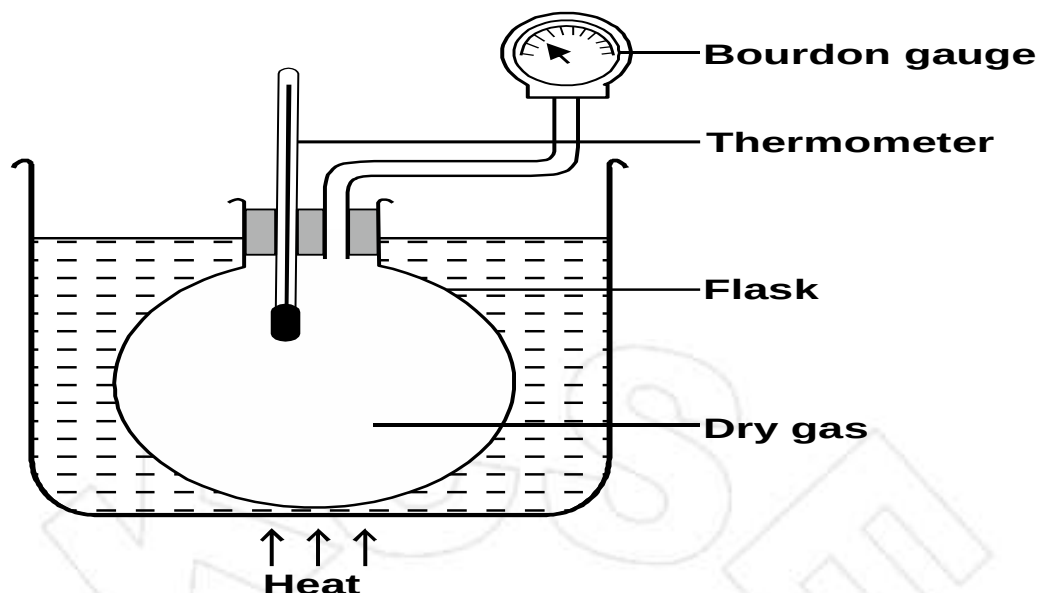
iii) Determine the time taken by the object to reach the ground.

(2 marks)

- iv) Determine the horizontal distance covered by the object from the point of impact to the point where it reached the ground. (2 marks)

16. a) What is meant by absolute zero temperature? (1 mark)

b) The set up below was used by a group of form three students to verify pressure law.



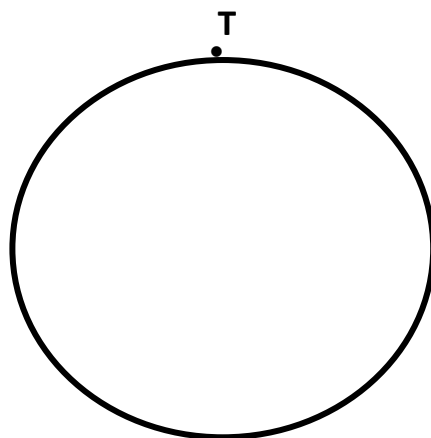
Describe briefly how the set-up can be used to verify pressure law. (4 marks)

c) A 4.5cm^3 bubble released at the bottom of a dam measured 18cm^3 at the surface of the dam.

Work out the depth of the dam taking atmospheric pressure to be 10^5 Pa and the density of water as 1g/cm^3 . (3marks)

17(a) One of the factors that affect the centripetal force is the mass of the body. State another factor. (1mark)

(b) A mass of 400g is rotated by a string at a constant speed V in a vertical circle of radius 100cm . The tension in the string is 9.2N which is experienced at point T.

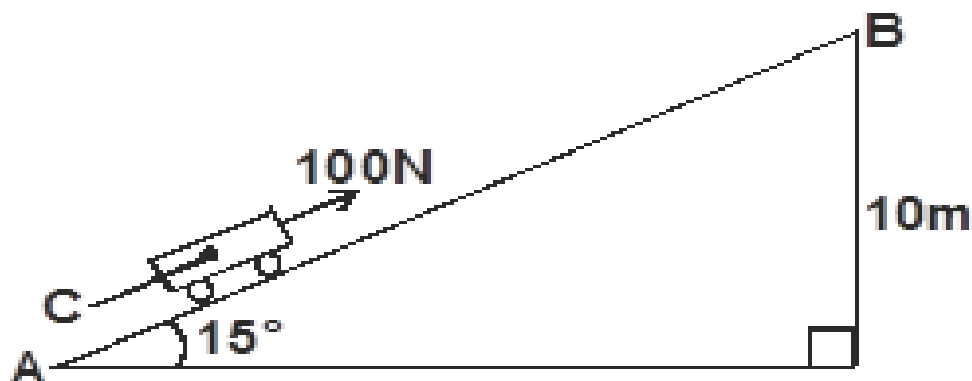


i) Determine the velocity V of the mass at point T. (3marks)

ii) Determine the tension in the string at the bottom of the circle. (2marks)

c) State two applications of circular motion (2marks)

18. The figure below shows an inclined plane, a trolley of mass 30kg is pulled up a slope by a force of 100N parallel to the slope. The trolley moves so that the centre of mass C travels from points A to B.



a) What is the work done on the trolley against the gravitational force in moving from A to B? (2marks)

b) Determine the work done by the force in moving the trolley from A to B (2 marks)

c) Determine the efficiency of the system. (3 marks)

d) Determine the mechanical advantage of the system. (3 marks)

19. a) Explain why it is advisable to use a pressure cooker for cooking at high altitudes. (1 mark)

b) A block of metal of mass 150g at 100°C is dropped into a lagged calorimeter of heat capacity 40J/K containing 100g of water at 25°C . The temperature of the mixture is 34°C . (specific heat capacity of water = 4200J/kg/K).

Determine:

(i) Heat gained by the calorimeter. (2marks)

(ii) Heat gained by water. (2marks)

(iii) Specific heat capacity of the metal block. (3marks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 7**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTION TO CANDIDATES**

- (a) Write your name, index number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) This paper consists of **two** sections: **A** and **B**.
- (d) Answer **all** the questions in sections **A** and **B** in the spaces provided.
- (e) **All** working **must** be clearly shown.
- (f) Silent non-programmable electronic calculators may be used.
- (g) Candidates should answer the questions in English.

FOR EXAMINERS USE ONLY

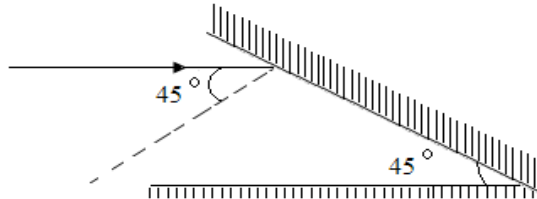
Section	Question	Maximum Score	Score
A	1 – 11	25	
B	12	12	
	13	12	
	14	12	
	15	9	
	16	10	
Total Score		80	

SECTION A 25 MARKS

Answer all the questions

1. The figure below shows a ray of light incident on a mirror at an angle of 45° . Another mirror is placed at an angle of 45° to the first one as shown. Sketch the path of the ray until it emerges.

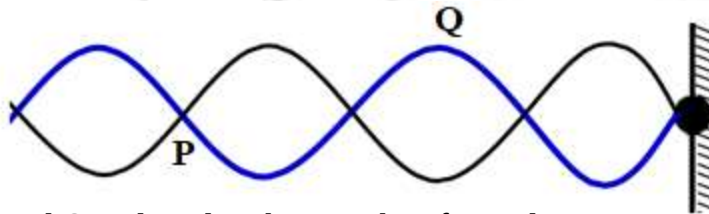
(2 marks)



2. State any two ways of reducing the magnetic force of attraction of a magnet

(2 marks)

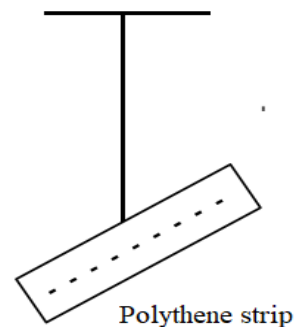
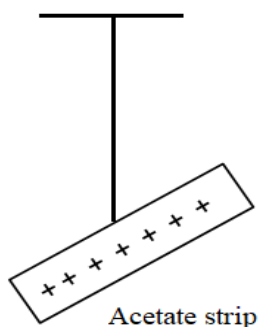
3. The figure below shows a transverse stationary wave along a string.



Name P and Q and explain how each is formed.

(3 marks)

4. The diagrams below show a positively charged acetate strip and a negatively charged polythene strip freely suspended and isolated.

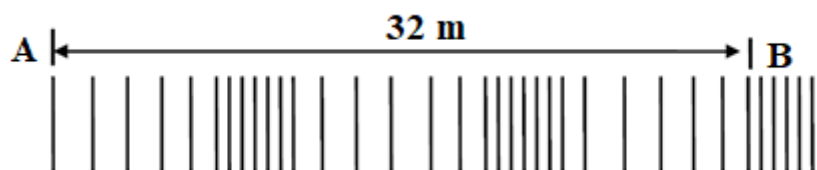


Two rods X and Y are brought up in turn to these strips. X attracts the acetate strip but repels the polythene strip. Rod Y does not repel either the acetate or the polythene. State the type of charge on each rod.

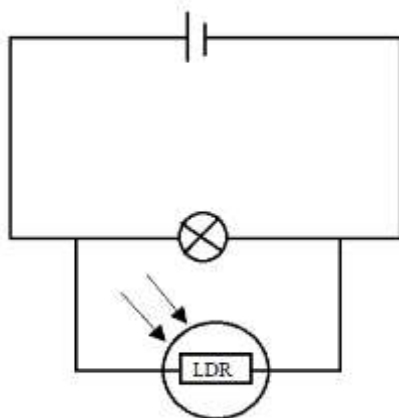
X **(1 mark)**

Y **(1 mark)**

5. The diagram below shows waves generated from a tuning fork. If the wave takes 0.1 second to move from point A to B. determine the frequency of the wave. (4 marks)



6. Name two detectors of **microwave** (2 marks)
7. Other than current state two other factors that affect the magnitude of force on a current carrying conductor placed in a magnetic field. (2 marks)
8. Give a reason why a concave mirror is not preferred as a driving mirror. (1 mark)
9. A student connected the set up below in the laboratory. Explain the observation made on the bulb when the set-up below is taken to a dark room (2 marks)



10. A person standing 110 m from the foot of a cliff claps his hands and hears a sound 0.75 seconds later. Find the speed of sound in air. (3 marks)
11. The figure below is part of electromagnetic spectrum.

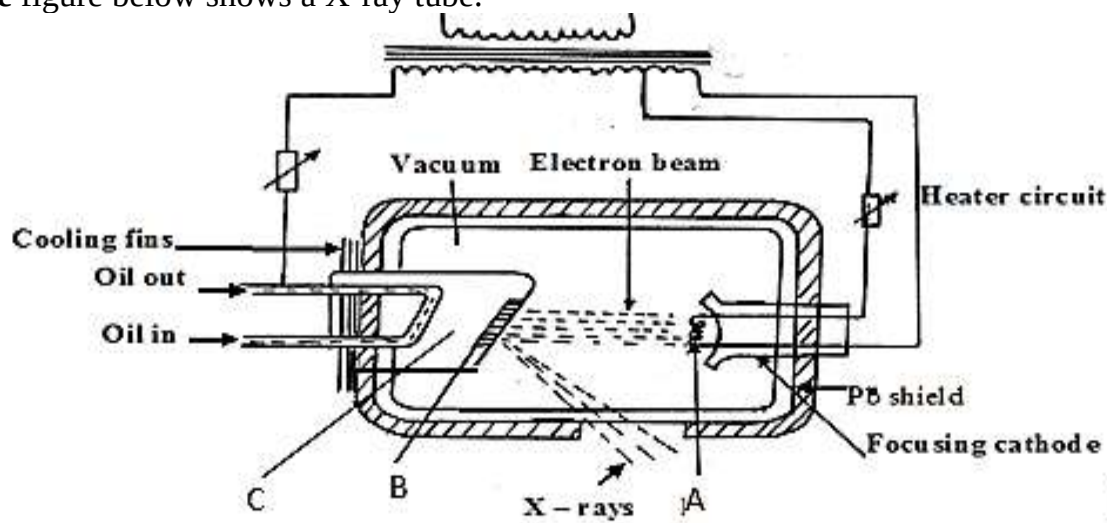
A		Visible light	UV	
---	--	---------------	----	--

- Identify radiation A and state its source. (2 marks)

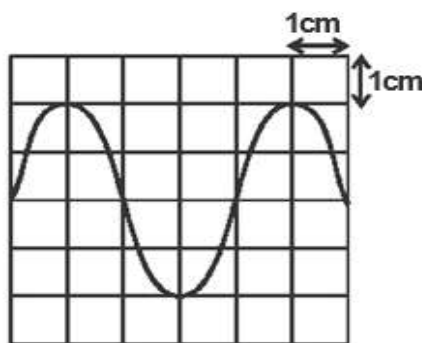
SECTION B 55 MARKS

Answer all the questions in this section

12. (a) The figure below shows a X-ray tube.



- (i) Name the part labelled C (1 mark)
- (ii) State the property of the material labelled B on the diagram which makes it suitable for use in the X-ray tube. (1 marks)
- (iii) Why is C inclined at an angle of 45° ? (1 mark)
- (iv) State the adjustment that can be made to vary
- I. The quality of X-rays (1 mark)
- II. The quantity of the X-rays. (1 mark)
- (v) An x-ray tube has an accelerating potential of 100KV. Determine the maximum frequency of the x-rays produced. (*Plank's constant* $= 6.63 \times 10^{-34} \text{ Js}$, $e = 1.6 \times 10^{-19} \text{ C}$) (3 marks)
- (b) In a CRO, waveform given below was displayed on the screen when the sensitivity at the Y plate was 10V/cm and time base set at 20 milliseconds/cm.



Determine:

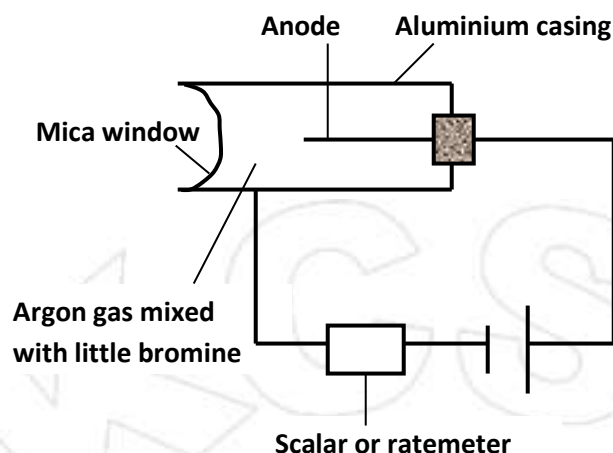
- (i) peak voltage (2 marks)
- (ii) frequency of the signal (2 marks)

13. a) ${}^{88}_{226}\text{Ra}$ decays into ${}^{86}_{222}\text{Rn}$ by emission of an alpha particle. Write a nuclear equation for the decay (1 marks)

b) i) What do you understand by the term half-life of a radioactive substance? (1 mark)

ii) A G.M tube registers 20 counts. When a radioactive source is brought close to it, it registers 3220 counts and 120 counts 30 hours later. What is the half-life of this substance? (3 marks)

c) The figure below shows a G.M tube.



i) What is the purpose of the mica window? (1 mark)

ii) Explain the purpose of the bromine (2 mark)

iii) Why should argon gas be kept at low pressure (1 mark)

iv) What is meant by the term “dead time” as used in GM tube (1 mark)

v) Briefly explain how GM tube works. (2 marks)

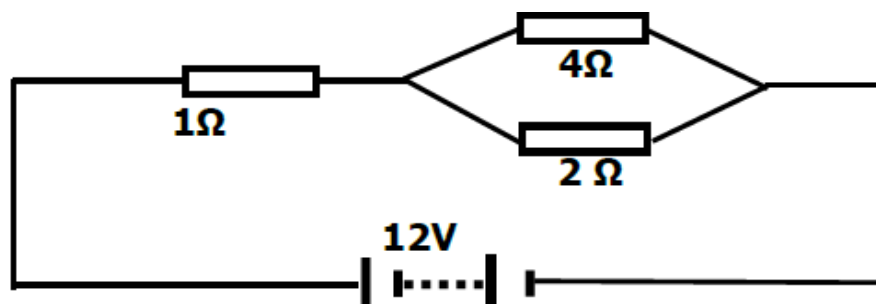
14. (a) State the Ohm's Law (1 mark)

(b) You are provided a rheostat, 2 cells, a voltmeter, an ammeter, a switch and a fixed resistor.

i) Draw a circuit diagram that can be used to verify Ohm's law. (2 marks)

ii) Describe how the above set up can be used to determine Ohms law. (4 marks)

(b) Study the circuit diagram below and answer the questions that follow.



Calculate

(i) Determine the total resistance in the circuit. (2 marks)

(ii) The current through the 4Ω resistor

(3 marks)

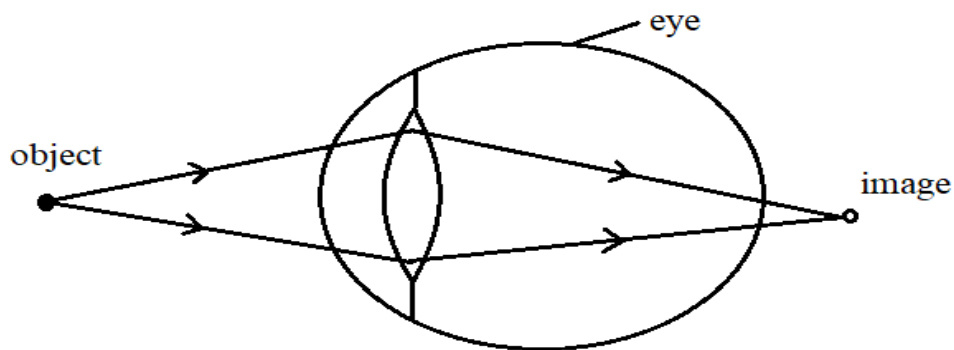
15. a) State Snell's law

(1 mark)

b) A ray of light travelling from water to glass makes an angle of incident of 30° . Find the angle of refraction in the glass. Refractive index of water = $\frac{4}{3}$. Refractive index of glass = $\frac{3}{2}$ (3 marks)

c) State the necessary and sufficient conditions for total internal reflection to occur. (2 marks)

d) The figure below shows a human eye defect.



(i) State one possible cause of this defect.

(1 mark)

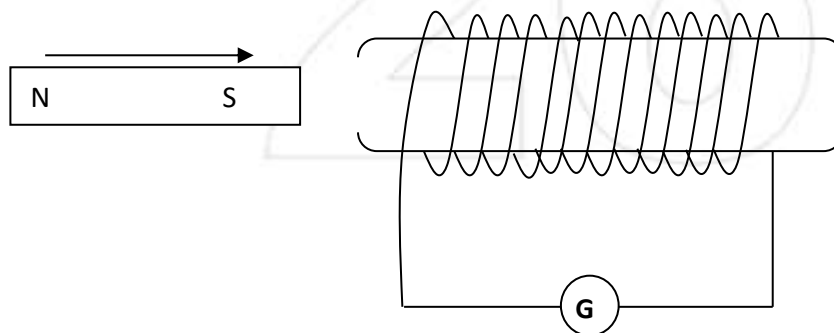
(ii) On the diagram, show how the defect is corrected.

(2 mark)

16. (a) State the Lenz's law of electromagnetic induction.

(1 mark)

(b) A bar magnet is moved into a coil of an insulated copper wire connected to a zero centre galvanometer as shown below



(i) Show on the figure above the direction of the induced current in the coil

(1 mark)

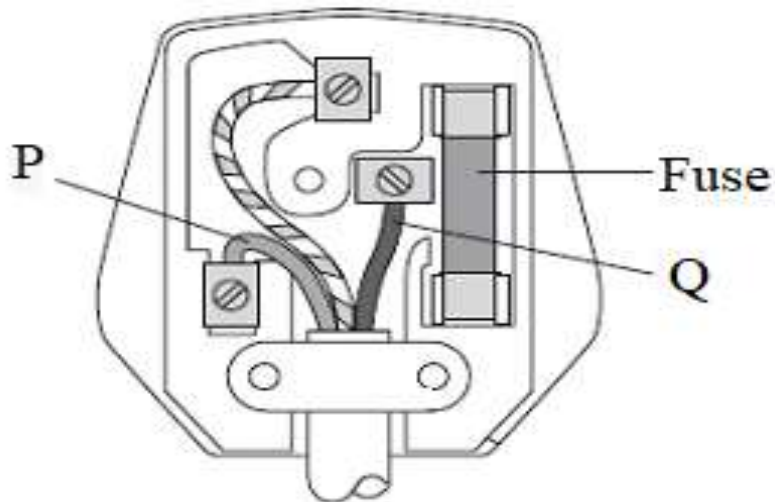
(ii) State and explain what is observed on the galvanometer when the south pole of the magnet is moved into and then withdrawn from the coil.

(2 marks)

(c) A transformer has 800 turns in the primary and 40 turns in the secondary winding.

The alternating voltage connected to the primary is 240V and current of 0.5.A. If 10% of the power is dissipated as heat within the transformer, determine the current in the secondary coil. (3 marks)

(d) The diagram below shows a three-pin plug.



(i) Name the colour of conductors P and Q

(2 marks)

(ii) Why is the earth pin longer than the rest in the three-pin plug shown above?

(1 mark)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 8**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO THE CANDIDATE:**

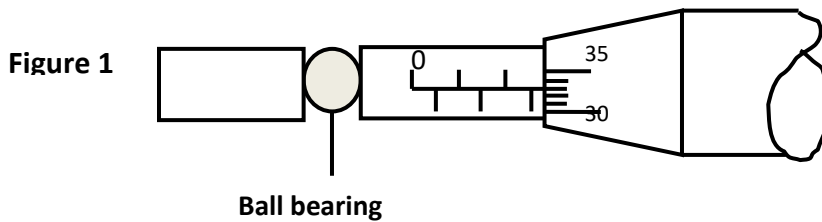
- (a) Write your **name** and **index number** in the spaces provided above.
- (b) **Sign** and write the **date** of examination in the spaces provided above.
- (c) This paper consists of **two** Sections **A** and **B**.
- (e) Answer **all** the questions in sections **A** and **B** in the spaces provided.
- (f) All working **must** be clearly shown in the spaces provided.
- (g) Mathematical tables and electronic calculators **may be** used.

FOR EXAMINER'S USE ONLY:

Section	Question	Maximum Score	Candidate's Score
A	1 – 12	25	
	13	08	
B	14	10	
	15	09	
	16	07	
	17	12	
	18	09	
Total Score		80	

SECTION A: (25 MARKS)*For Marking Schemes Contact 0746-222-000 / 0753-222-000*

1. A ball bearing is held between the anvil and spindle of a micrometer screw gauge as shown in the **Figure 1** below.

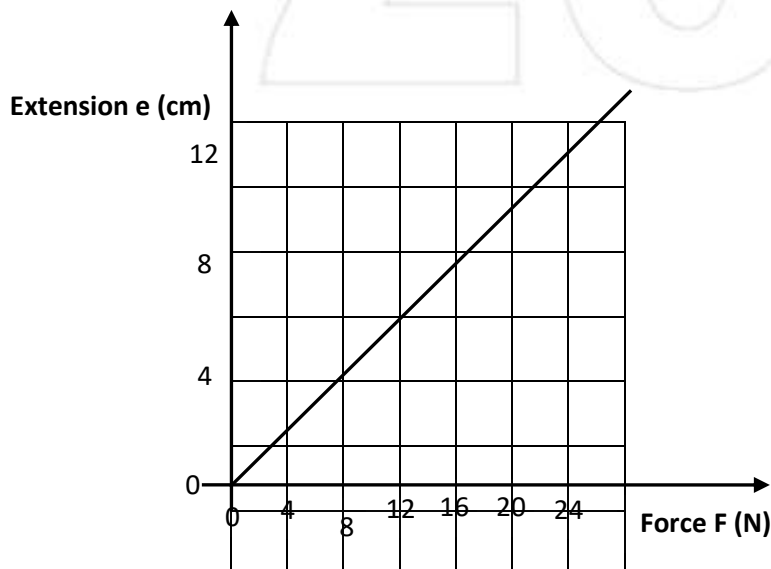


- What is the diameter of the ball bearing? (1 mark)
2. State two properties of a liquid that is suitable for use in a thermometer. (2marks)
3. A column of air 15cm is trapped by mercury thread of 10cm as shown below. Calculate the length of the trapped air when the tube is laid horizontally given that atmospheric pressure is 76cmHg.

(3 Marks)



4. Why are gases more compressible while liquids and solids are almost incompressible? (1mark)
5. The graph shows variation of extension and stretching force F for a spring which obeys Hooke's law.

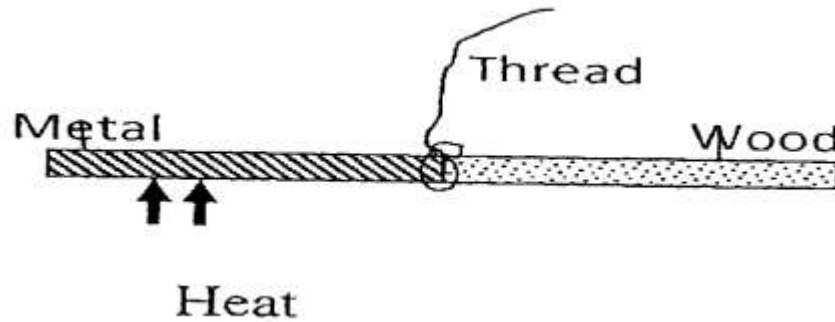


- (i) Determine the spring constant in SI units. (1mark)

(ii) The energy stored when the extension is 20cm.

(2marks)

6. The figure 2 below shows a rod made of wood on one end and metal on the other end suspended freely with a piece of thread so that it is in equilibrium.



The side made of metal is now heated with a Bunsen flame. State with a reason, the side to which the rod is likely to tilt.

(2 marks)

7. State one factor that would increase the surface tension of pure water in a beaker of water. (1 mk)

8. The figure below (figure 3) shows a uniform metal rod balanced at its Centre by different forces.

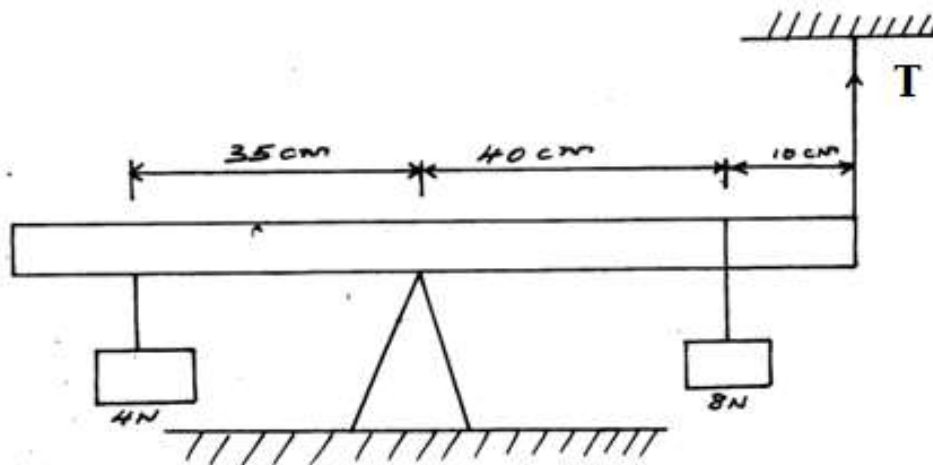
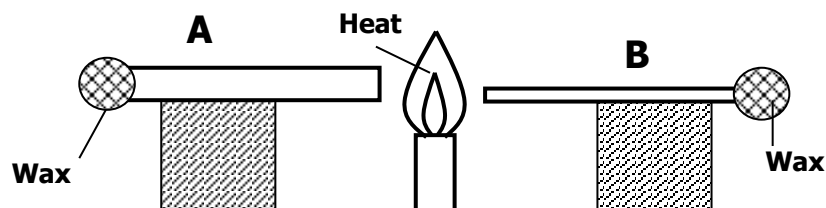


Figure 3

Determine the value of T.

(3 marks)

9. Two rods of copper A and B of the same length but different thickness with candle wax attached to either end are heated as shown below.



State and explain the observation made.

(2 marks)

10. Figure 4 shows a manometer attached to a gas supply. If the atmospheric pressure is $1.0336 \times 10^5 \text{ Pa}$. Calculate the pressure of the gas supply. (Density of mercury = 13600 kg/m^3) (2 marks)

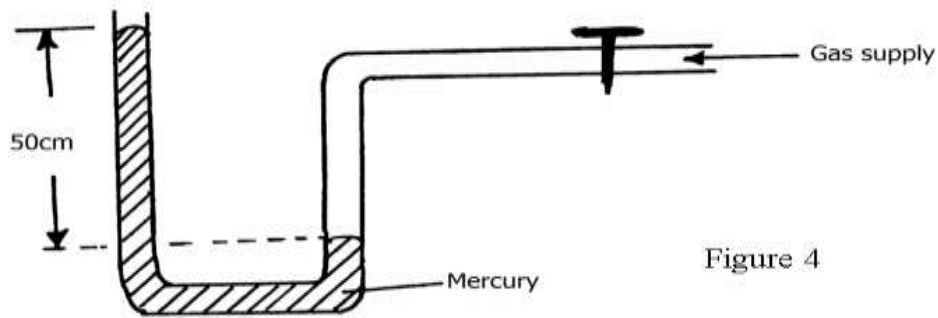


Figure 4

11. A block of wood measuring 0.8m by 0.5m by 2m floats in water. 1.2m of the block is submerged. (Density of water = 1000 kg/m^3 , $g=10 \text{ N/kg}$) Determine the weight of the water displaced. (3 marks)
12. The figure 5 below shows two light sheets of paper arranged as shown.

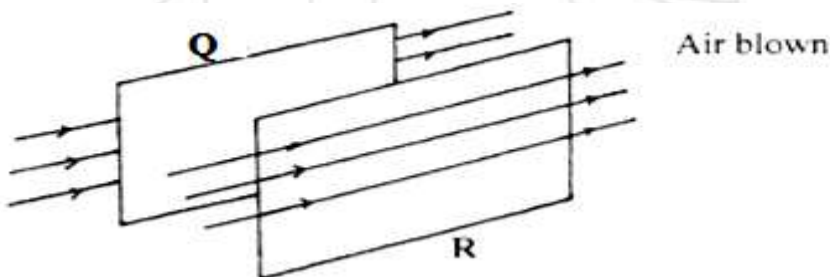


Fig. 5

- It is observed that the papers move away from each other when strong air is blown at the same time behind paper Q and in front of paper R as shown. Explain (2 marks)

SECTION B (55 MARKS)

13. A block and tackle is made up of three pulley wheels on top and two pulley wheels at the bottom in figure 6

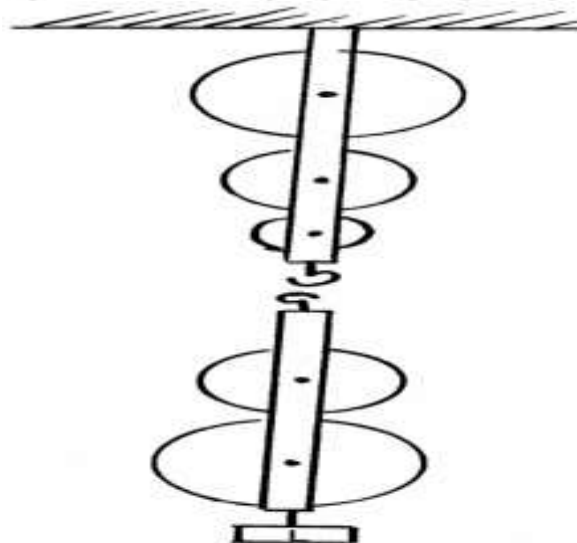


Figure 6

(a) Complete the diagram by drawing the chain which passes over the wheels and indicate where the effort is applied (2 marks)

(b) What is the velocity ratio (V.R) of the machine (1 mark)

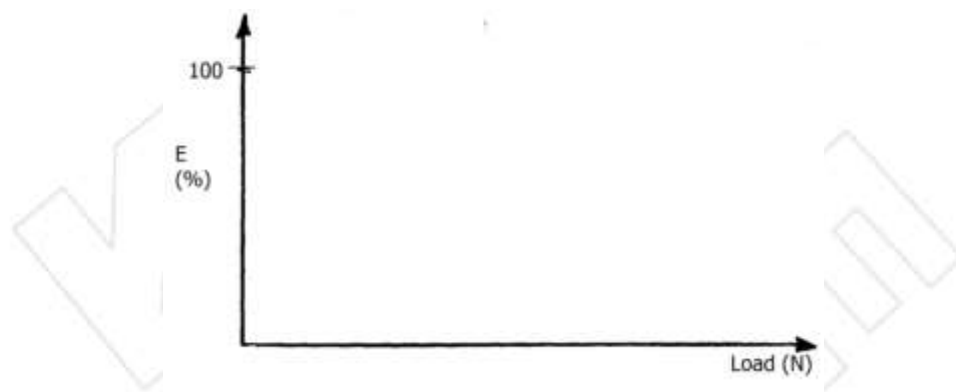
(c) A load of 1120N is lifted by an effort of 250N

Determine

(i) The mechanical advantage (M.A) of the system (2 mark)

(ii) The efficiency, E, of the system (2 marks)

(e) Using the axes given below, sketch a graph of efficiency, E, against load (1 mark)



14. (a) What is meant by the term specific latent heat of fusion of a substance? (1 mark)

(b) Water of mass 200g at a temperature of 60°C is put in a well lagged copper calorimeter of mass 80g. A piece of ice at 0°C and mass 20g is placed in the calorimeter and the mixture stirred gently until all the ice melts. The final temperature of the mixture is then measured (Latent heat of fusion of ice = 334000 J kg^{-1} , specific heat capacity of water = $4200 \text{ J kg}^{-1} \text{ K}^{-1}$)

Determine:

(i) The heat absorbed by the melting ice at 0°C (2 marks)

(ii) The heat absorbed by the melted ice (water) to rise to temperature T (2 marks)

(iii) The heat lost by the warm water and the calorimeter (Specific heat capacity of the calorimeter = $900 \text{ J kg}^{-1} \text{ K}^{-1}$) (3 marks)

(iv) The final temperature T of the mixture (2 marks)

15. A lead shot of mass 40g is tied to a string of length 70cm. It is swung vertically at 5 revolutions per second. (Take $g=10 \text{ m/s}^2$)

(a) Determine;

(i) Periodic time, (1 mark)

(ii) Angular velocity (2 marks)

(iii) Linear velocity (2 marks)

(iv) Maximum tension in the string.

(2 marks)

(b) The figure 7 below shows a container with small holes at the bottom in which wet clothes have been put. When the container is whirled in air at high speed as shown, it is observed that the clothes dry faster. Explain how the rotation of the container causes the clothes to dry faster.

(2 marks)

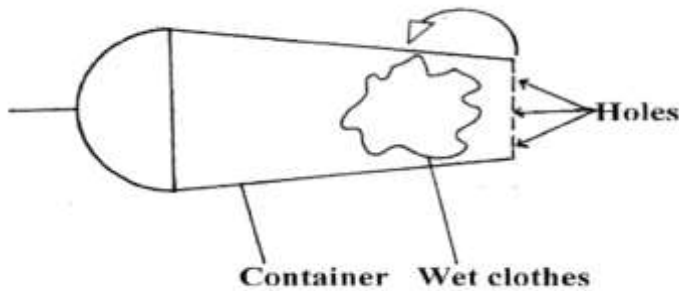
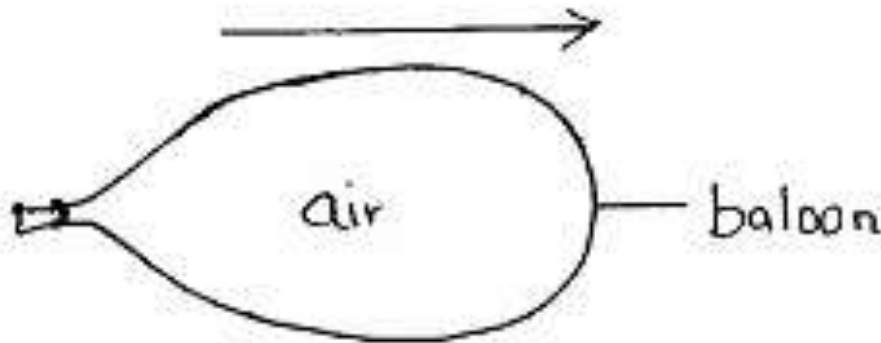


Fig 7

16. (a) Give a reason why the inside of a helmet is lined with sponge.

(1 mark)

(b) The figure below shows a balloon filled with air.



When the mouth is suddenly opened, the balloon moves in the direction shown above by the arrow. Explain that observation.

(2 marks)

(c) A rock of mass 150kg moving at 10m/s collides with a stationary rock of mass 100kg. They fuse after collision. Determine the

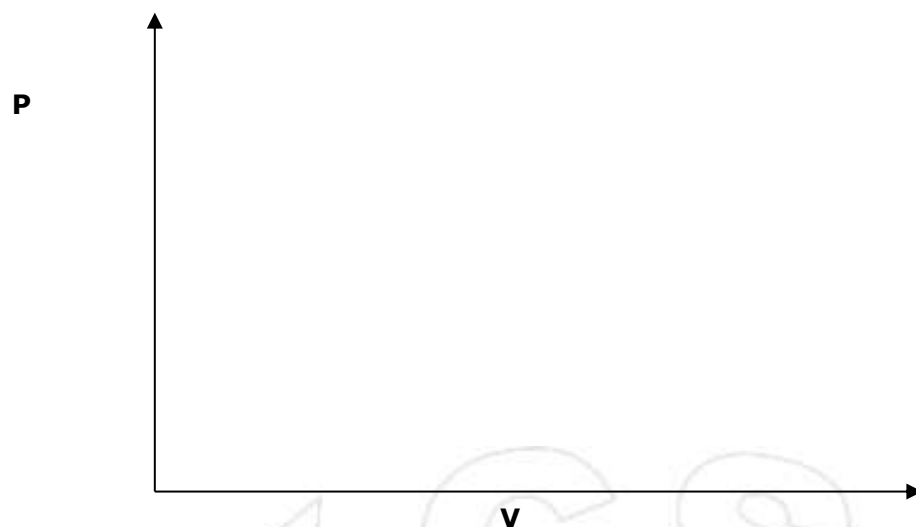
(i) Total momentum before collision.

(2 marks)

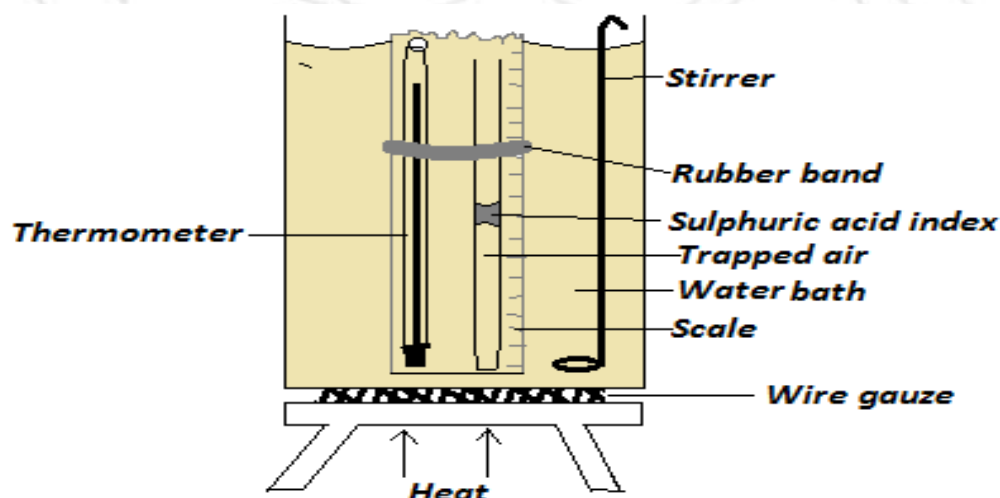
(ii) Their common velocity after collision.

(2 marks)

17. (a) On the axis below, sketch a graph to show how the pressure of a fixed mass of a gas varies with volume at constant temperature. (1 mark)

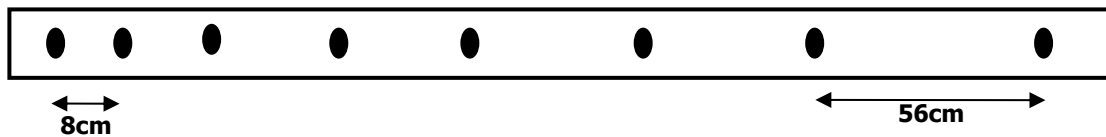


- (b) The set-up below shows an arrangement that can be used to Verify Charles' law.



- (i) State any one use of sulphuric acid index in the above set up. (1 mark)
 - (ii) What is the use of the stirrer? (1 mark)
 - (iii) State two measurements that should be taken in this experiment. (2 marks)
 - (iv) Describe how the set up can be used to verify Charles' law. (4 marks)
- (c) The volume of a gas enclosed with a movable piston is 300 cm^3 when the temperature is 290K . Determine the temperature at which the volume of the gas increases to 355 cm^3 (Assume pressure does not change) (3 marks)

18. (a). The section of the tape shown below was produced when a tape running down an incline plane was attached to a **ticker-tape timer** of frequency **50Hz**.



- i) Indicate above the tape the direction in which the trolley was moving. (1 mark)
 - ii) What type of current was used to operate the ticker timer? (1 mark)
 - iii) Find the acceleration of the trolley in SI units. (3 marks)
- (b). A stone is projected vertically upwards with initial velocity of 40m/s from the ground.
- Calculate:
- i) Time taken to reach maximum height (2 marks)
 - ii) Maximum height reached (2 marks)

THIS IS THE LAST PRINTED PAGE. BEST OF LUCK.

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 8**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- 1) Write your name and your admission number in the spaces provided above.
- 2) Write the date and your signature.
- 3) This paper consists of two sections; **A** and **B**
- 4) Answer **all** questions in section **A** and **B** in the spaces provided.
- 5) All working **must** be clearly shown in the spaces provided in this booklet.
- 6) Non programmable silent electronic calculators may be used.

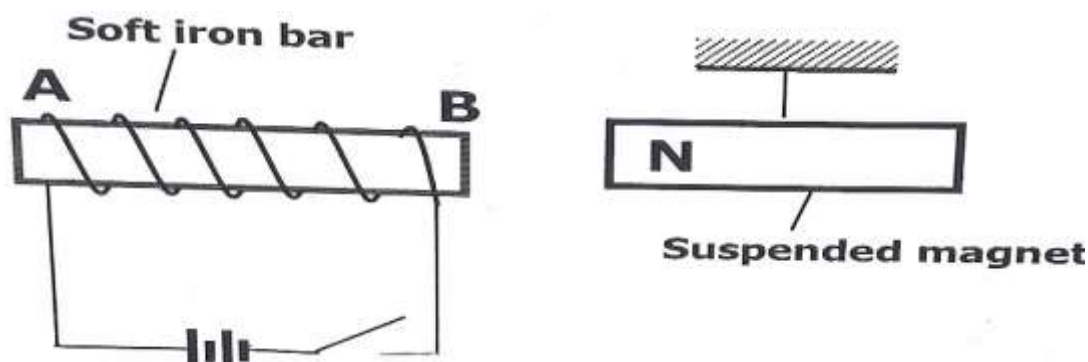
FOR EXAMINERS USE

SECTION	QUESTIONS	MAX SCORE	SCORE
A	1 – 12	25	
B	13	13	
	14	15	
	15	15	
	16	12	
	TOTAL	80	

SECTION A (25 MARKS)

Answer ALL the questions in this section in the spaces provided

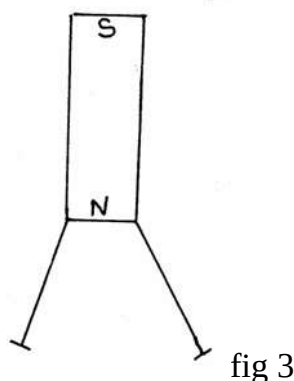
1. Distinguish between real and virtual Image (1mk)
- a) A pinhole camera forms an image of size 10cm. The object is 5m tall and 20m away from the pinhole. Find the length of the pinhole camera. (2mks)
2. a) The **figure 1** below shows a soft iron bar that's placed in a coil near a free suspended magnet.



- State and explain the observation made when the switch is closed. (2mks)
- b.) Give a reason why attraction in magnetism is not regarded as a reliable method of testing for polarity. (1mk)
3. The **figure 2** below shows an isolated negative charge placed closer to a negatively charged plate. Draw the electric field patterns. (2mk)

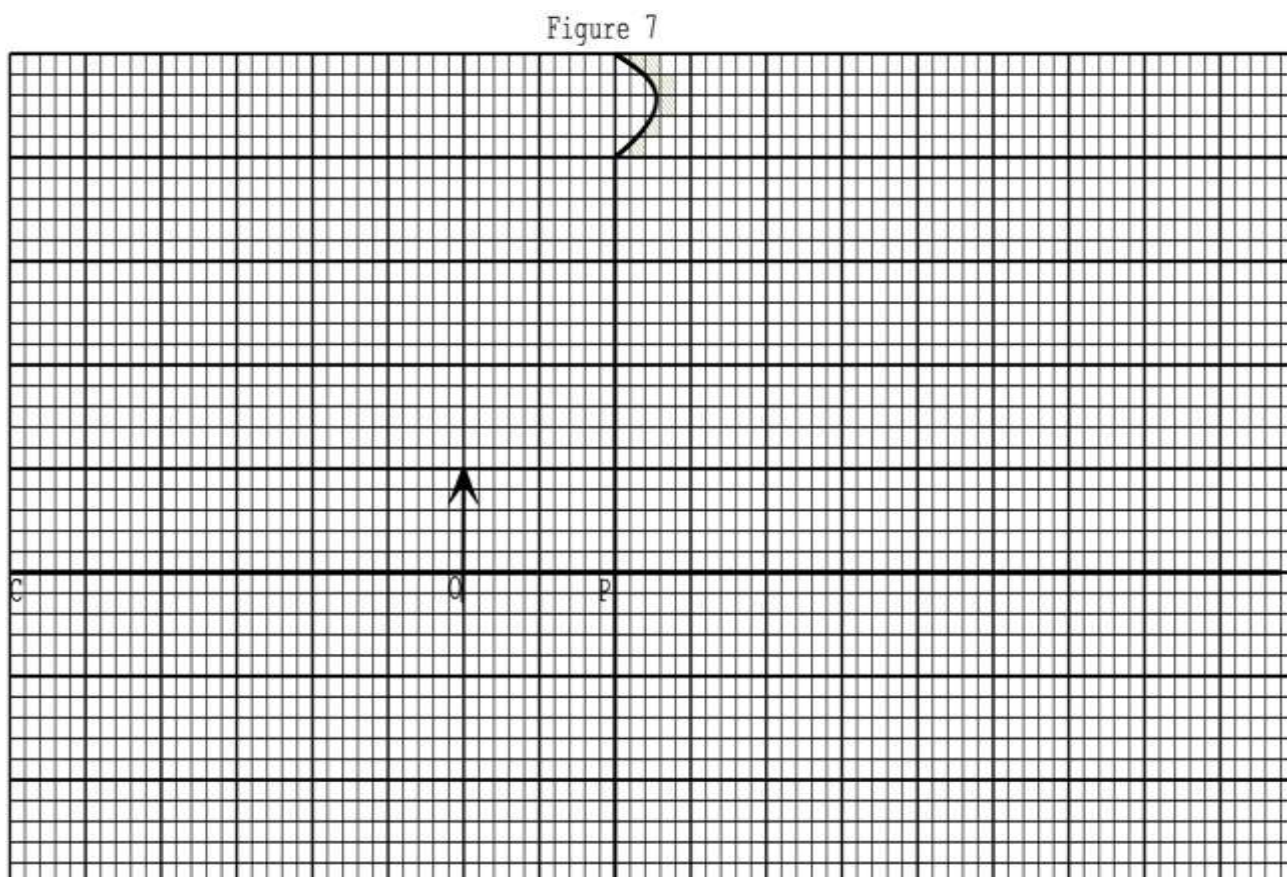


4. Two pins are hanging from a magnet as shown in the diagram below (**figure 3**)



- Explain why they do not hang vertically downwards. (2mks)
5. (a) State the effect of pressure on the speed of sound in air. (1mk)

- (b) A boy stands 190m from a high wall and claps his hands. If he hears an echo 1.3 Seconds later, calculate the speed of sound in air. (2mks)
6. State any two factors that determine the heating effect by an electric current. (2mks)
7. Figure 4 below shows an object, O placed 10 cm in front of a concave mirror whose radius of curvature, C is 40 cm.



- On the same figure, draw a ray diagram to show the position of the image formed. (3 mks)
8. State two advantages of an alkaline battery over lead acid battery. (2mks)
9. An electric bulb with filament of resistance 480Ω is connected to 120 V mains supply. Determine the energy dissipated in 7 min (3 mks)
10. The figure 6 below shows a cross section of a dry cell.

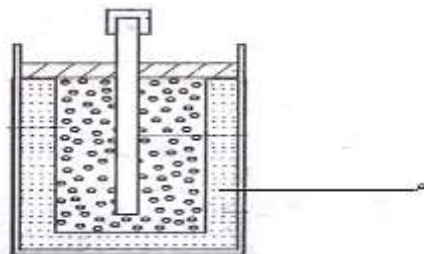


Figure 6

- (i) Name the part labeled A (1 mark)
- (ii) State the use of manganese (iv) oxide in the cell (1 mark)

SECTION II (55 marks)

11. a) i) In large currents, large resistors in parallel are preferred to low resistors in series.

Explain

(1mk)

ii) State one condition under which ohm's law is obeyed in a metal conductor.

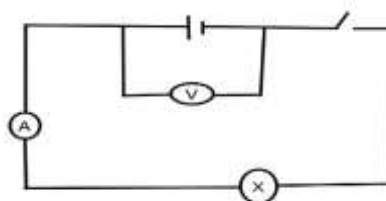
(1mk)

iii) A circuit constituting a battery, a metal wire, an ammeter and a switch connected in a series.

The switch is closed and the ammeter reading noted. The metal wire is now heated. State observation on the ammeter reading and give a reason for your answer.

(2mks)

b.) In the **figure 7** below, the voltmeter reads 2.4V when the switch is open. When the switch is closed, the voltmeter reads 2.1V and the ammeter reads 0.15A.



Determine the

i) E.m.f of the cell

(1mk)

ii) Internal resistance of the cell

(3mks)

iii) Resistance of the bulb

(2mks)

d.) Explain why a voltmeter of high resistance is more accurate in measuring potential difference than one of low resistance

(1mk)

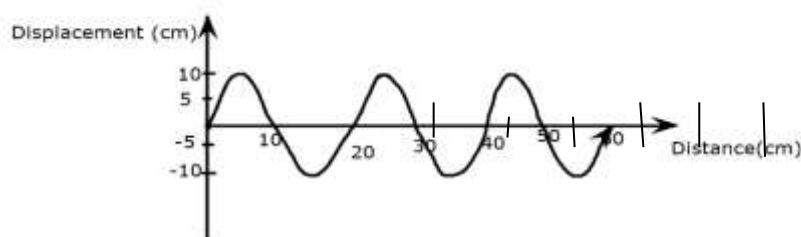
d.) Distinguish between electrical resistance and a resistor

(1mk)

12. a) I. Define the term wavelength of a longitudinal wave

(1mk)

II. The **figure 8** below shows a displacement distance for a certain wave motion.



Determine

i) The amplitude of the wave

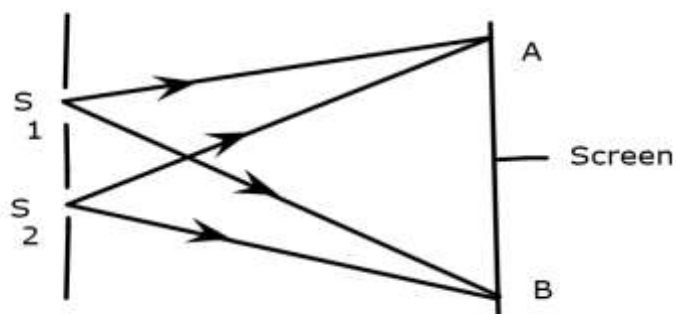
(1mk)

ii) The wavelength of the wave

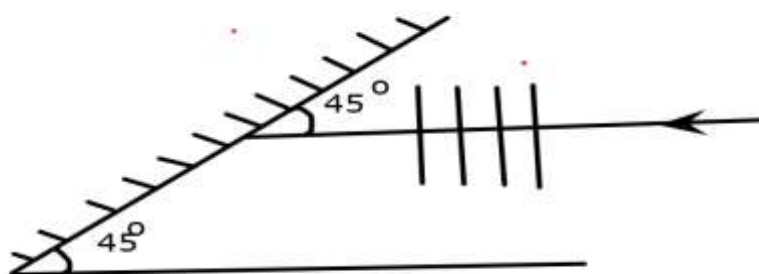
(1mk)

iii) Given that the frequency of the wave is 40Hz, determine the:

- I. Periodic time (T) (1mk)
- II. Speed of the wave (3mks)
- b.) **Figure 9** below shows light rays from two coherent sources S_1 and S_2 falling on screen. Dark and bright fringes are observed between A and B



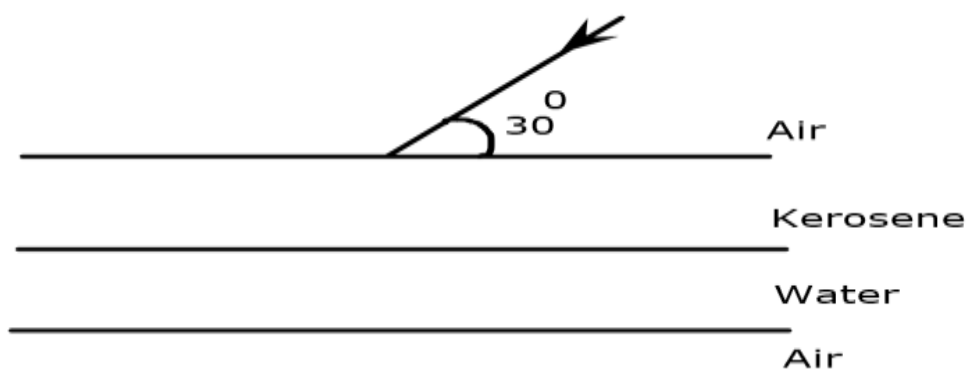
- i) State the function of S_1 and S_2 (1mk)
- ii) State how
- I. Bright fringes are formed (1mk)
- II. Dark fringes are formed (1mk)
- c). **Figure 10** below shows plane water waves incident on a plane reflector placed at an angle to the path of the waves.



Complete the diagram to show the reflected waves (2mks)

13. a.) State Snell's law (1mk)

b.) The **Figure 11** below shows a ray of light travelling incident on air-kerosene interface.



(i) If the speed of light in kerosene is 2.08×10^8 m/s, find the refractive of kerosene. (speed of light in air = 3.0×10^8) (2mks)

ii.) Determine the angle of refraction in water ($n_w = 4/3$) (4mks)

iii.) On the same diagram sketch the path of light as it traverses through the media showing the angle of refraction in air (3mks)

14. (a) State Ohm's law. (1 mark)

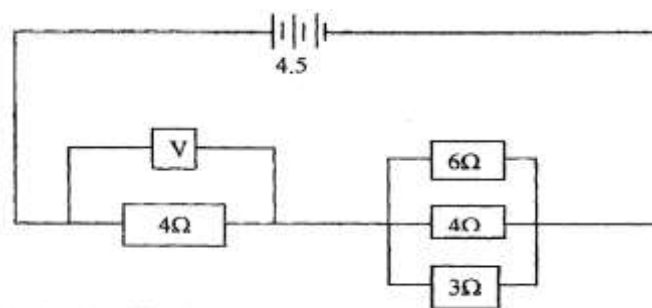
(b) You are provided with the following apparatus:

- Connecting wires
- An ammeter
- Fixed resistor
- A voltmeter
- A variable resistor
- Switch
- 2 dry cells in a cell holder

(i) In the spaces below, draw the circuit that can be used using the apparatus above to verify Ohm's Law. (3 marks)

(ii) Briefly explain how you can obtain the results to verify Ohm's law. (4mrk)

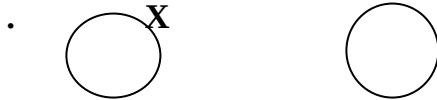
(c) Study the circuit diagram below and answer the questions that follow.



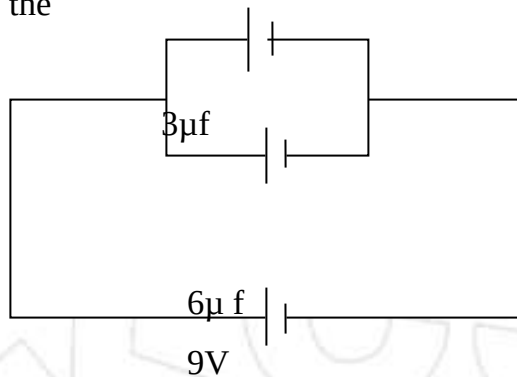
(i) Calculate the effective resistance of the circuit. (3mrks)

(ii) Find the voltmeter reading. (2mrks)

15. a) Describe two factors that affects the strength of an electromagnet (2 mks)
- b) State Fleming's left hand rule (1 mks)
- c) Show the magnetic field pattern around this set up (2 mks)



16. a) Define the term capacitance (1 mks)
- b) Determine the



- i) Charge in $3\mu\text{F}$ (2 mks)
- ii) P.d across $6\mu\text{F}$ (2 mks)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 9**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

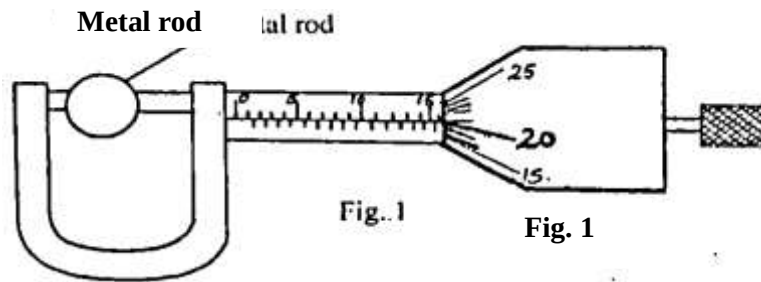
- Write your name, school and index number in the spaces provided above.
- Write the date of examination and sign in the spaces provided above.
- This paper consists of two sections, Section A and B.
- Answer **ALL** the questions in section A and B in the spaces provided.
- **ALL** answers and working **MUST** be clearly shown.
- Mathematical tables and electronic calculators **may be** used.
- Take acceleration due to gravity, $g = 10\text{m/s}^2$

FOR EXAMINER'S USE ONLY:

Section	Question	Maximum score	Candidate's score
A	1–12	25	
B	13	12	
	14	11	
	15	10	
	16	12	
	17	10	
	TOTAL	80	

*Answer **ALL** the questions in the spaces provided.***For Marking Schemes Contact 0746-222-000 / 0753-222-000**

1. Figure 1 below shows a micrometer screw gauge being used to measure the diameter of a metal rod. The thimble scale has 50 divisions.



Find the diameter of the metal rod.

(1 mark)

2. Explain briefly how the temperature in a green house is kept higher than outside. (2 marks)

The diagram shown in figure 2 below is an arrangement of three pulley wheels used to help in lifting loads. Use it to answer questions 3 and 4.

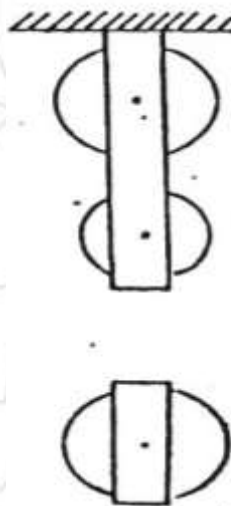


Fig. 2

3. Complete the diagram to show how the rope goes round the wheels, position of the load and the effort. (2 marks)
4. Write down the velocity ratio (VR) of the system. (1 mark)
5. State how temperature affects the speed of sound in air. (1 mark)
6. State **two** facts which show that heat from the sun does not reach the earth surface by convection. (2 marks)
7. The diagram in figure 3 below shows water with negligible viscosity flowing steadily in a tube of different cross-section area. If at a point A, the cross section area is 120cm^2 and the velocity of water is 0.40ms^{-1} , calculate the velocity at B where cross section area is 4.0cm^2 ? (3 marks)

A

B

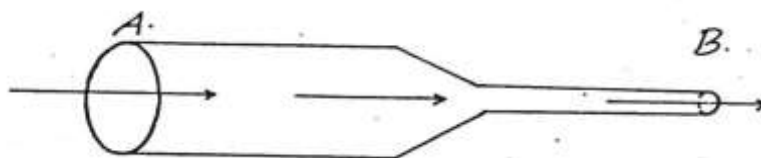
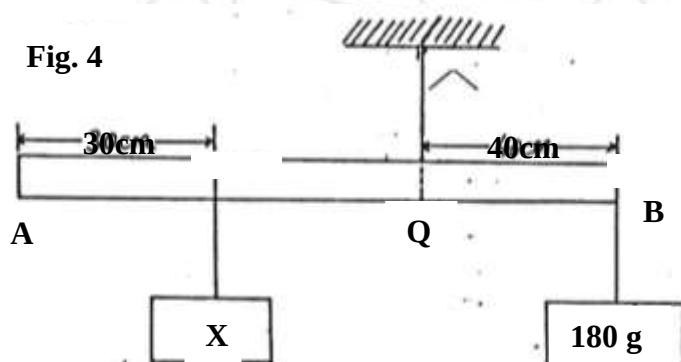


Fig. 3

8. A motor uses an electrical energy at a rate of 200W and raises a mass of 25kg through a vertical distance of 20m in 0.5 minutes. Determine the efficiency of the motor. (3 marks)
9. Name **three** types of forces that act between bodies not in contact. (3marks)
10. How long will it take 240V, 3000W electric immersion heater to raise the temperature of 150 litres of water in a well-lagged calorimeter made of copper of mass 20kg from 15° to 70°C ? (3 marks)
11. The diagram shown in the Figure 4 below shows a system in equilibrium with the rule horizontal. AB is a uniform rule of length 1.0m and weight 1.8N. Calculate the weight of the block X. (3 marks)

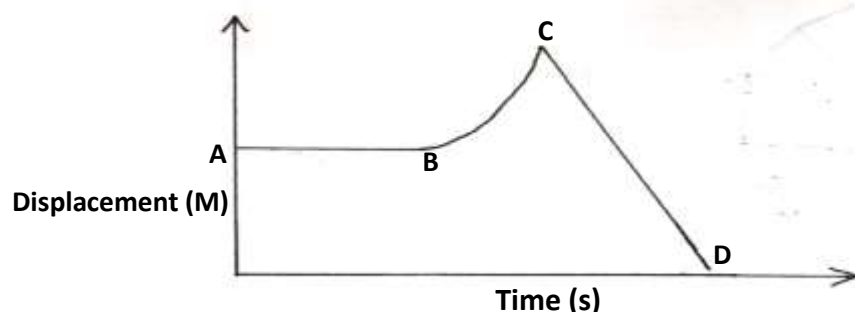


12. State the reason why a trailer carrying heavy loads has many wheels. (1 mark)

SECTION B (55 MARKS)

Answer ALL the questions

- 13.(a) The **figure5** below shows the displacement – time graph of the motion of particle.

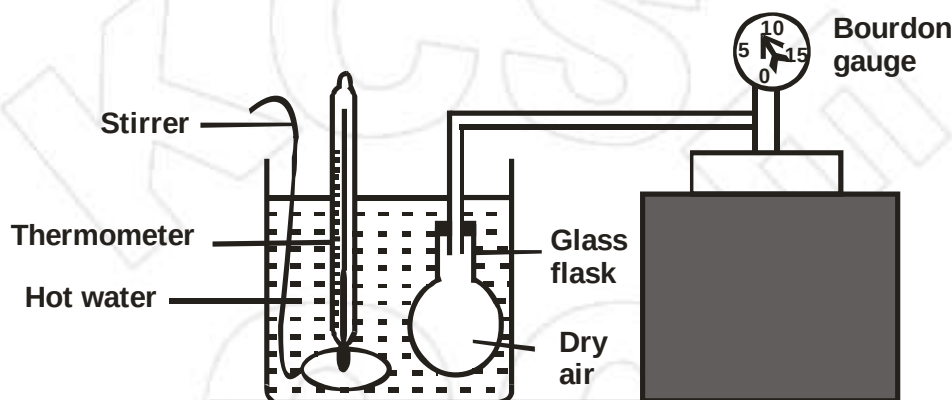


- (a) State the nature of the motion of the particle between

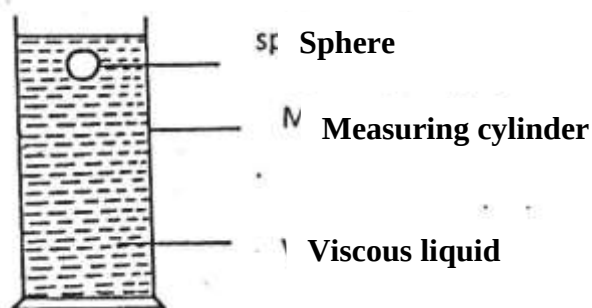
(i) A and B

(1mk)

- (ii) B and C (1mk)
- (iii) C and D (1mk)
- (b) A ball is thrown horizontally from top of a vertical tower and strikes the ground at a point 50 m from the bottom of the tower. Given that the height of the tower is 45m, determine the
- (i) Time taken by the ball to hit the ground. (2m)
- (ii) Initial horizontal velocity of the ball (2mks)
- (iii) Vertical velocity of the ball just before striking the ground. (2mks)
- (take acceleration due to gravity g as 10m/s^2)
14. a) State the pressure law; (1 mark)
- b) Explain how a gas exerts pressure. (2 marks)
- c) The figure below shows a set up used to verify pressure law.



- i) State the measurement that may be taken in the experiment. (2 marks)
- ii) Explain how the measurement in (i) above may be used to verify pressure law. (2 marks)
- iii) A car tyre is at pressure of $5.0 \times 10^5 \text{ Pa}$ at a temperature of 37°C . While it is running the temperature rises to 75°C . What is the new tyre pressure? (Assume the tyre does not expand) (3 marks)
15. i) Distinguish between inelastic and elastic collisions. (2 marks)
- b) The diagram in Figure 6 below shows a sphere moving in a viscous liquid in a tall measuring cylinder.

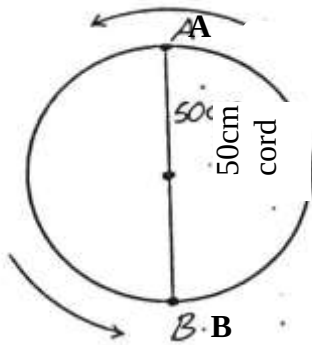


- i) Show on the diagram the forces acting on the sphere. (3 marks)

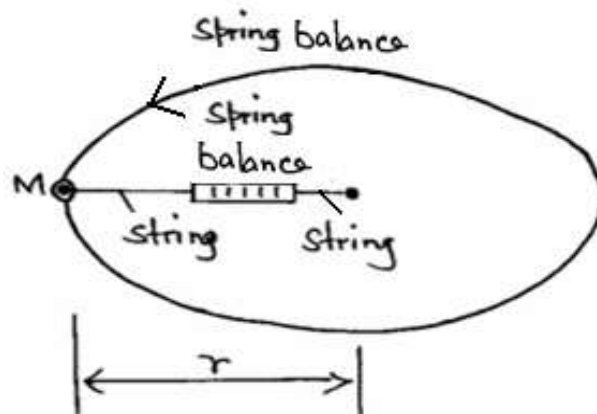
- ii) Sketch a graph showing the variation of velocity with time in figure 7 below. Show on the graph the terminal velocity, V_T . (2 marks)



16. A mass of 1kg is attached to a cord of length 50cm. It is whirled in a circle in a vertical plane at 10 revolutions per second as shown in the figure 8 below.



- a) Find the tensions in the cord when the mass is at:
- Highest point of the circle A. (2 marks)
 - Lowest point of the circle B. (2 marks)
- b).The diagram below shows a spring tied to an object, m, and rotated in a circular path of radius, r.



- (i).What provides the force that keeps the object moving in a circular path. (1 mark)

- (ii). The speed of the object is constant but the body is accelerating. Explain. (1 mark)
- (iii). If the object is whirled faster, what would happen to spring balance reading? (1 mark)
- (iv). Give a reason for your answers in b(iii) above. (1 mark)
- v). As the object is whirled round the string snaps and cuts off. Describe the subsequent path of the object. 1 mark)
17. (a) State the law of floatation. (1 mark)
- (b) **Figure 9** shows a piece of cork held with a light thread attached to the bottom of a beaker. The beaker is filled with water.

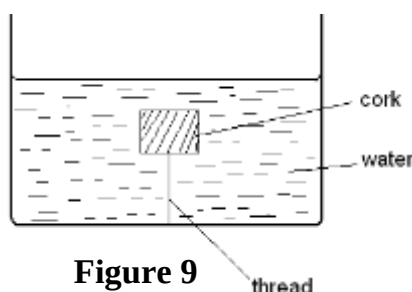


Figure 9

- i) Indicate and label on the diagram the forces acting on the cork. (1 mark)
- ii) Write an expression showing the relationship between the forces above. (1 mark)

A solid displaces 8.5cm^3 of liquid when floating in a certain liquid and 11.5cm^3 when fully submerged in the same liquid. The density of the solid is 0.8g/cm^3 . Determine:-

- i) The upthrust on the solid when floating. (2 marks)
- ii) The density of the liquid. (2 marks)
- ii) The upthrust on the solid when fully submerged. (2 marks)

- 18.) The following results were obtained in a experiment to verify Hooke's law when a spring was extended by hanging various loads on it.

Load (N)	0.00	1.00	2.00	3.00	4.00	5.00	6.00
Length of spring in cm	10.00	11.50	13.00	14.50	16.00	18.00	24.00
Extension	0.00						

- (I) Complete the table for the extension e above. (1mk)
- (II) Plot a graph of load (y-axis) against extension (5mks)
- (III) From the graph determine the spring constant. (2mks)
- (IV) Calculate the energy stored when the spring is stretched to 16 cm. (2mks)

EXPECTED EXAM 9

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

Kenya Certificate of Secondary Education.

232/2

PHYSICS**PAPER 2**

TIME 2 HRS

INSTRUCTIONS

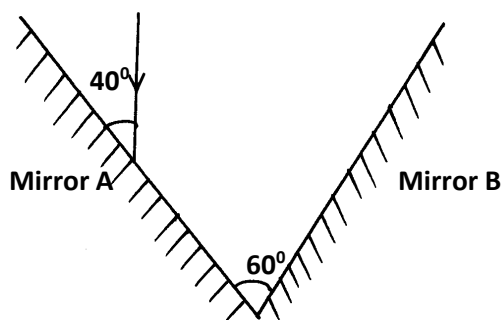
- i) Answer All questions in the spaces provided.
- ii) Use the following **CONSTANTS** where applicable.
- iii) All working must be clearly shown for numerical questions.
- iv) Candidates should check to ascertain that all questions are printed as indicated in the table below.

Constants

- i) Density of water = 1g/cm^3 or 1000kg/m^3 .
- ii) Gravitational acceleration = 10m/s^2 .

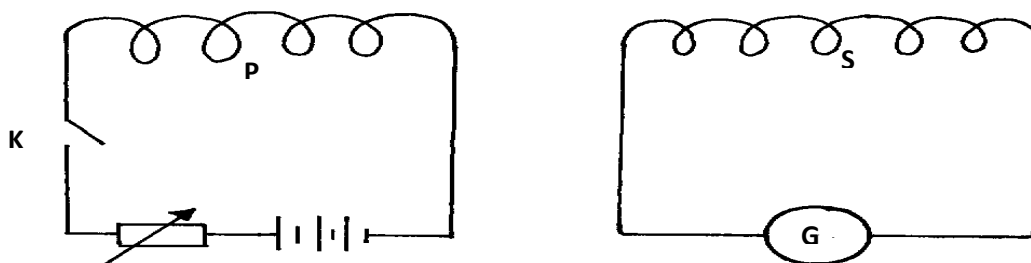
SECTION A (25 MARKS)

1. A ray is incident on two mirrors inclined at 60° as shown in the diagram below. (3mks)



Determine the angle of reflection on mirror **A**, hence trace the path of the ray as it leaves mirror **B**.

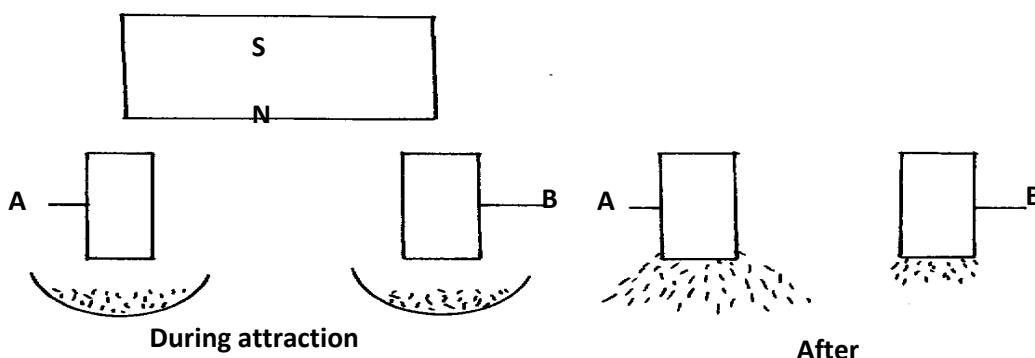
2. a) The coils **P** and **S** are connected as shown below. **P** is connected to a battery, rheostat and a switch **K**. **S** is connected to a galvanometer **G**.



State the behavior of the pointer on **G** in the following cases;

- i) When **K** is switched on (closed) (1mk)
- ii) When **K** is opened. (1mk)
- b) A transformer has 200 turns in the primary coil and 1000 turns in the secondary coil. If the transformer is 100% efficient and the current in the secondary coil is 0.15A, determine the current in the primary coil. (3mks)

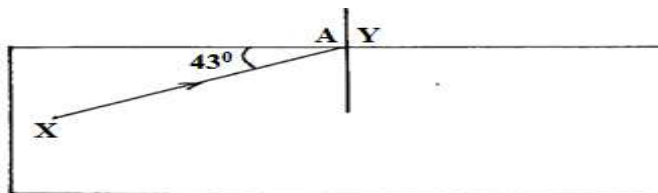
3. Figure below shows a simple experiment using a permanent magnet and two metal bars **A** and **B** Put close to the iron filings.



State with a reason which bar is made from a soft magnetic material.

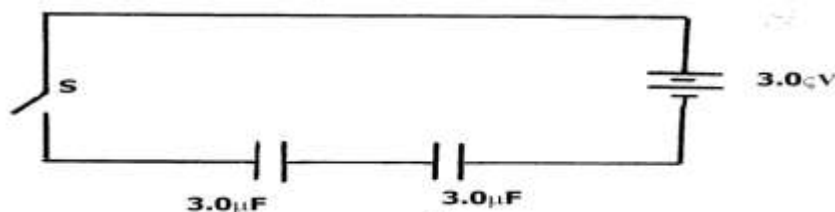
(2mks)

4. The diagram below shows a ray of light **xy** traveling through a glass block of critical 42° to point **A**



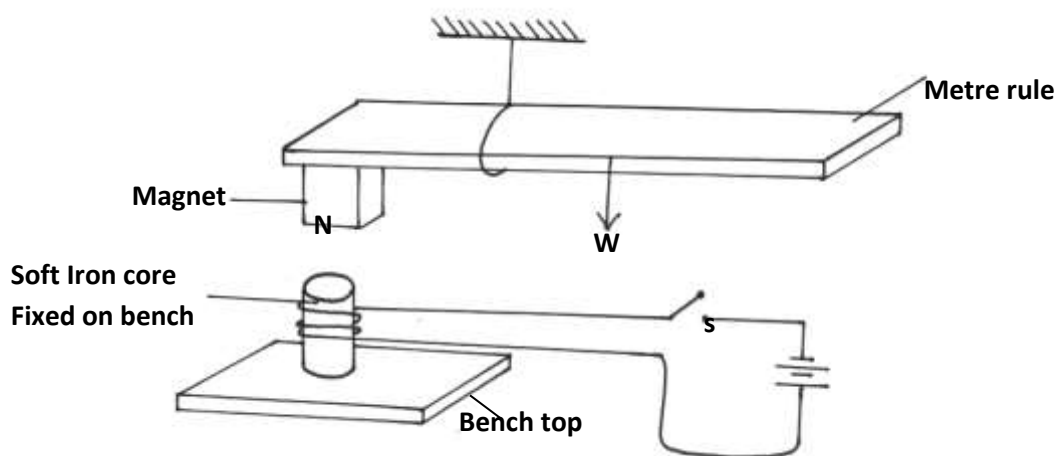
- a) Calculate the refractive index of the glass block. (3mks)
- b) On the same diagram, draw the path of the ray as it travels past point **A**. (1mks)
5. The photoelectrons liberated from an illuminated metal surface constitute a photoelectric current. What is the effect of decreasing the intensity of illumination on the magnitude of the photoelectric current? (1mk)

6. Figure below shows a battery of e.m.f 3.0v connected in series with two capacitors.



Determine the energy stored in the combined capacitors when the switch is closed. (3mks)

7. The figure below shows a meter rule in equilibrium with the magnet and weight **W**. The Soft iron core is fixed to the bench.



State and explain the effect on the meter rule when the switch **S** is closed

(2mks)

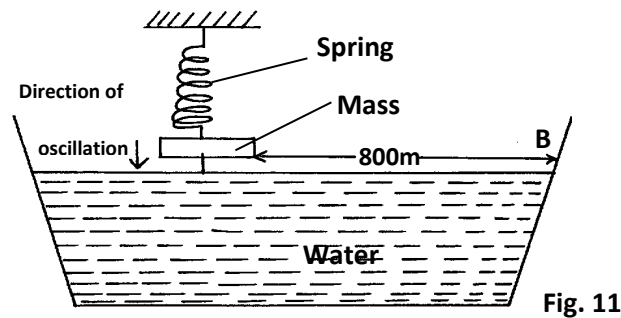
8. State how polarization is reduced in a dry cell.

(1mk)

9. State two differences between the cathode ray tube (CRT) of a T.V and the cathode ray oscilloscope (CRO). (2mks)
10. Distinguish between a P-type and a N-type extrinsic semiconductors. (2mks)

SECTION B (55 MARKS)

11. (a) Students set up a mass attached to a spring such that when it oscillates it taps on water surface in a wide shallow tank as in figure 11 below.



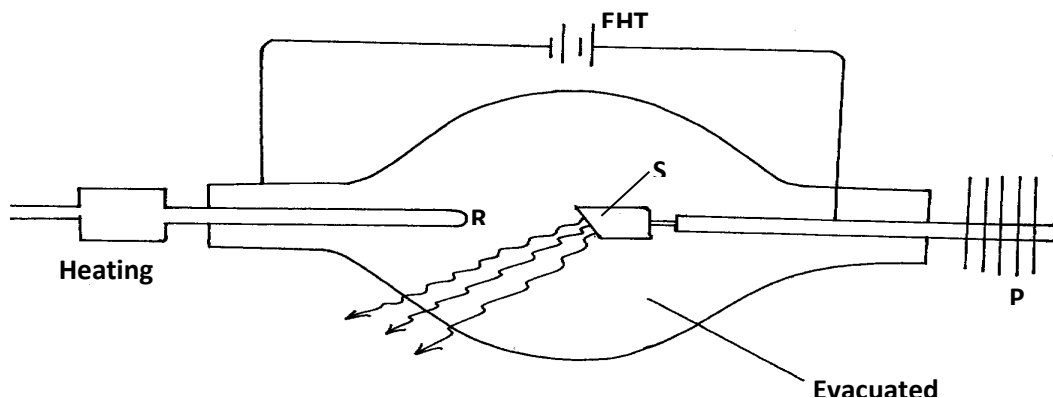
The students measured time for 20 oscillations and found that the mass takes 36 seconds.

Determine:

- (i) The periodic time of the mass (2mks)
- (ii) The frequency of the waves produced on the water surface (2mk)
- (iii) The speed of the waves if the students counted four ripples between the mass and end **B** of the tank (3mks)
- (b) State any **two** factors that would increase the speed of sound in air (2mks)
- (c) An echo sounder of a ship received the reflected waves from a sea bed after 0.20s.
- (i) Determine the depth of the sea bed if the velocity of sound in water is 1450m/s (2mks)
- (ii) When the ship above passes over a sunken reef, the echo sounder receives an echo after 0.16s.

Determine the height of the sunken reef (2mks)

12. (a) The diagram below shows an X-ray tube drawn by a student. Use it to answer the questions which follow.



- (i) State with reason the material used for the part labeled **R**. (2mks)

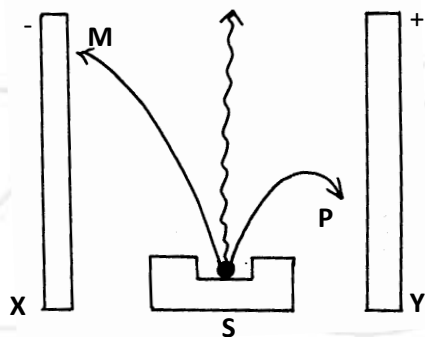
- (ii) Why is the tube evacuated (1mk)
- (iii) How can the wavelength of the X-rays emitted from this tube be reduced (1mk)
- (b) X-rays are emitted when a tube operates at 3×10^2 V and a current of 0.01 A is passing through it (take $e = 1.6 \times 10^{-19}$ C, $m_e = 9 \times 10^{-31}$ kg). Calculate;
- (i) The velocity of the electron on hitting the target. (3mks)
- (ii) The minimum wavelength of the X-rays emitted (3mks)
- C (i) State **one** properties of X-rays (1mk)
- (ii) State **one** uses of X-rays (1mk)

13. a) Differentiate between a nuclear fusion and nuclear fission. (2mks)

b) The equation below represents a nuclear reaction.

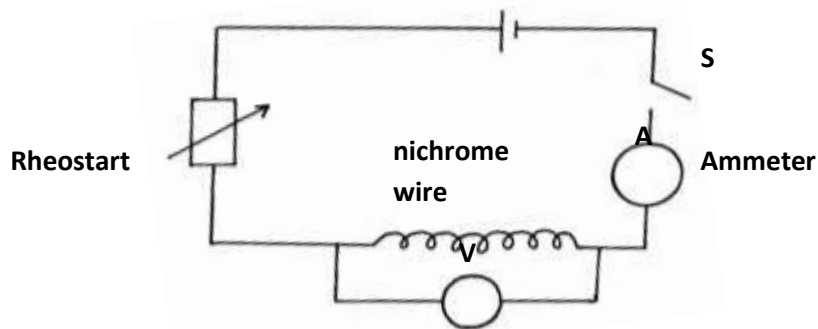


- i) Determine the values of **p** and **q**. (2mks)
- ii) Identify **Y**..... (1mk)
- c) The figure below represents deflection of various radiations from a radioactive source S placed in electric field between two plates **X** and **Y**.



- Identify the radiations marked with letters **M** and **P**. (2mks)
- d) A sample of radioactive substance initially has 8×10^{25} particles. The half life of the sample is 98 seconds. Determine the number of particles that will have decayed after 294 seconds. (3mks)
14. a) State Ohm's Law. (1mk)

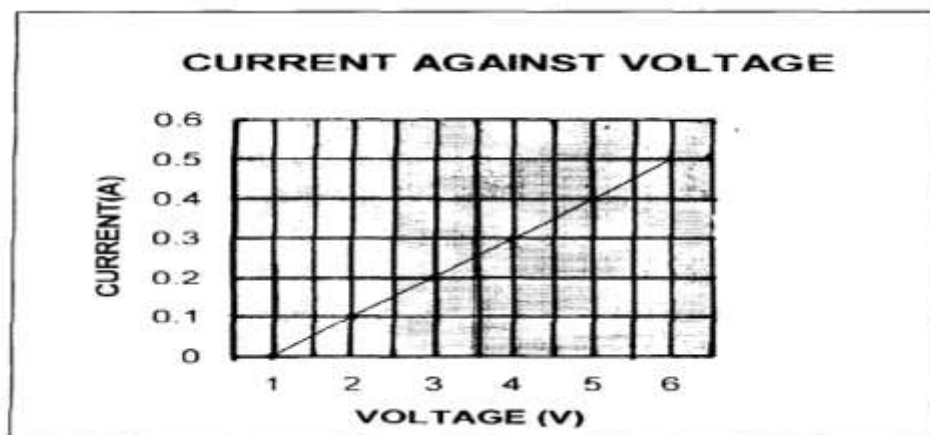
b) The figure below shows a circuit that can be used to verify Ohm's law



Explain briefly how the setup can be used to verify ohm's law

(3mks)

- c) The graph below was obtained from experiment to determine the effective resistance of two resistors connected in parallel. If the value of one resistor is 50 ohms. determine the value of the other resistor.



From the graph, determine

- i) effective resistance of the two resistors

(2mk)

- ii) the value of the other resistor

(3mks)

15. (a) An object **O** stands on the principal axis of a concave mirror as shown in figure 9 below.

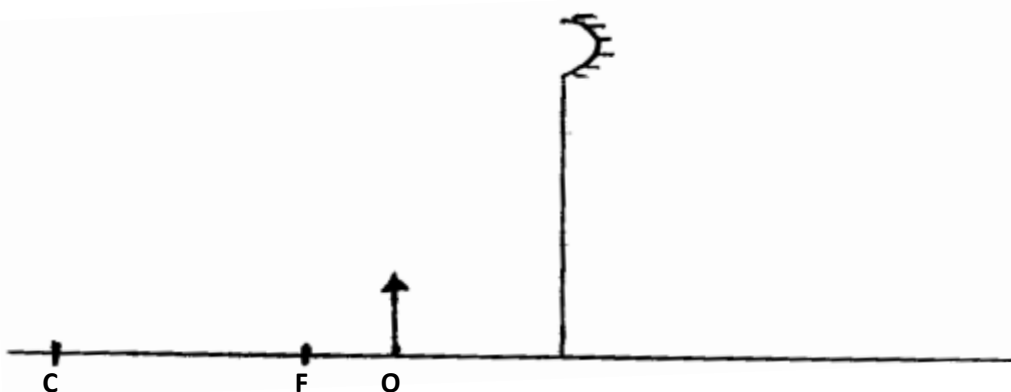
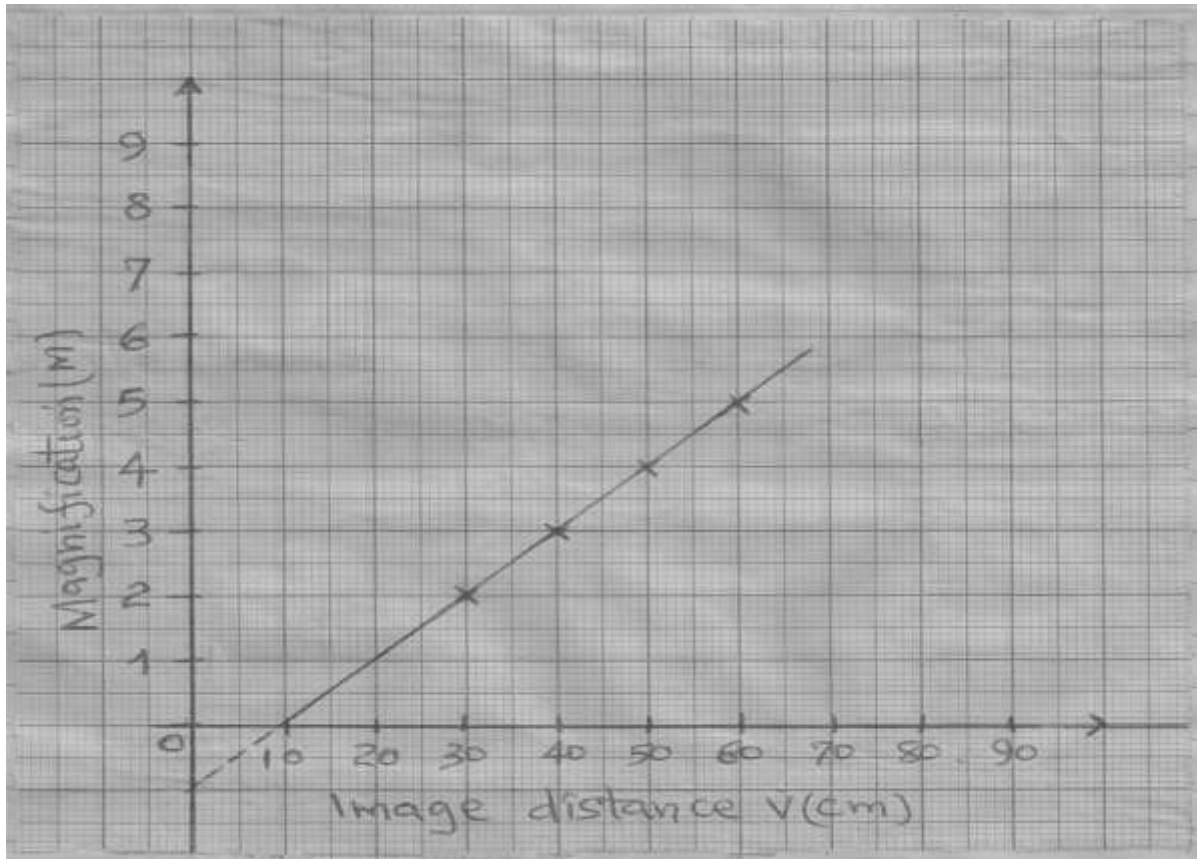


Fig. 9

- (i) By drawing suitable rays, show the position of the image (3mks)
- (ii) Determine the magnification of the image formed (2mks)
- (b) In an experiment to determine the focal length of a converging lens, a group of form four students collected some data and used the results to plot the graph shown in figure below.



Using the graph above, determine:

- (i) The object position when the image position is 45 cm (2mks)
- (ii) Slope of the graph. (2mks)
- (iii) The focal length of the lens given $m = \frac{v}{f} - 1$

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 10**

232/1

PHYSICS**PAPER 1**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***INSTRUCTIONS TO CANDIDATES**

- Write your name, admission number, class and signature in the spaces provided at the top of the page. This paper consists of two sections; **A** and **B**.
- Answer **ALL** the questions in the spaces provided.
- Mathematical tables and electronic calculator may be used.
- All working **MUST** be clearly shown.

FOR EXAMINER'S USE ONLY

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 – 12	25	
B	13	13	
	14	12	
	15	10	
	16	13	
	17	9	
TOTAL SCORE		80	

SECTION A (25 MARKS)

Attempt all the questions

1. The figure (a) below shows the reading of a micrometer screw gauge when the micrometer is closed and figure (b) shows the reading on the same micrometer when used to measure the diameter of a marble.

Figure (a)

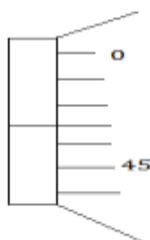
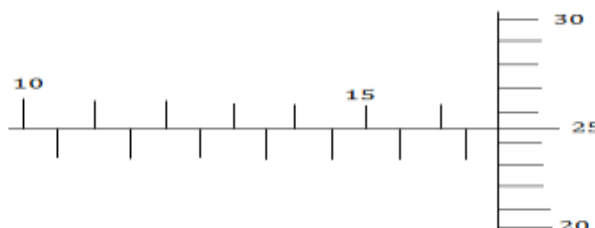


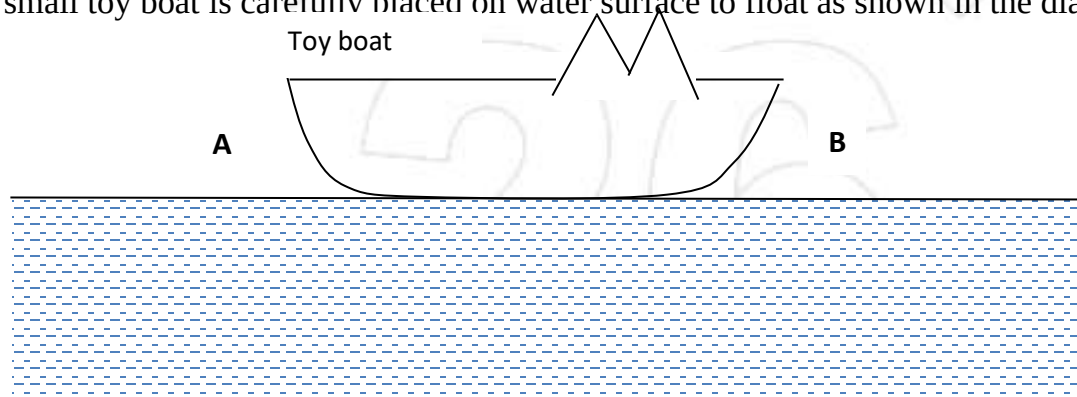
Figure (b)



Determine;

- (i) the zero error of the micrometer. (1 mark)
- (ii) the actual diameter of the marble. (2 marks)

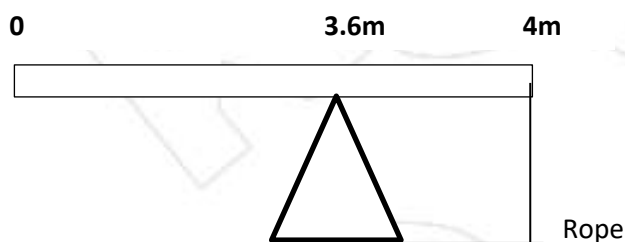
2. A small toy boat is carefully placed on water surface to float as shown in the diagram.



Points **A** and **B** are near the ends of the boat. A drop of oil is placed at point **B**. State and explain what happens to the boat. (2 marks)

3. A girl in a school in Nakuru plans to make a barometer using a liquid of density 1.25 g cm^{-3} . If the atmospheric pressure in the school is 93750 N m^{-2} . Determine the minimum length of the tube that she will require? (3 marks)

4. Smoke is enclosed in smoke cell and sealed. When illuminated and viewed under a microscope, it is observed to be moving in continuous random motion. State and explain the observation when cold water is poured on the smoke cell. **(2 marks)**
5. At 27°C the pressure of a gas is 50cmHg. At what temperature in degree Celsius would the pressure of the gas fall to 40cmHg if the volume is kept constant? **(3 marks)**
6. State **two** factors that affect the spring constant of a spring. **(2 marks)**
7. Describe briefly how a fire alarm that uses a bi-metallic strip works. **(2 marks)**
8. An empty density bottle weighs 22g when empty and 65g when full of a liquid of density 800kg/m^3 . Determine the volume of the bottle. **(2 marks)**
9. The figure below shows a uniform rod of length 4m and pivoted at 3.6m mark. The rod is held horizontally with a vertical rope at 4m mark as shown.

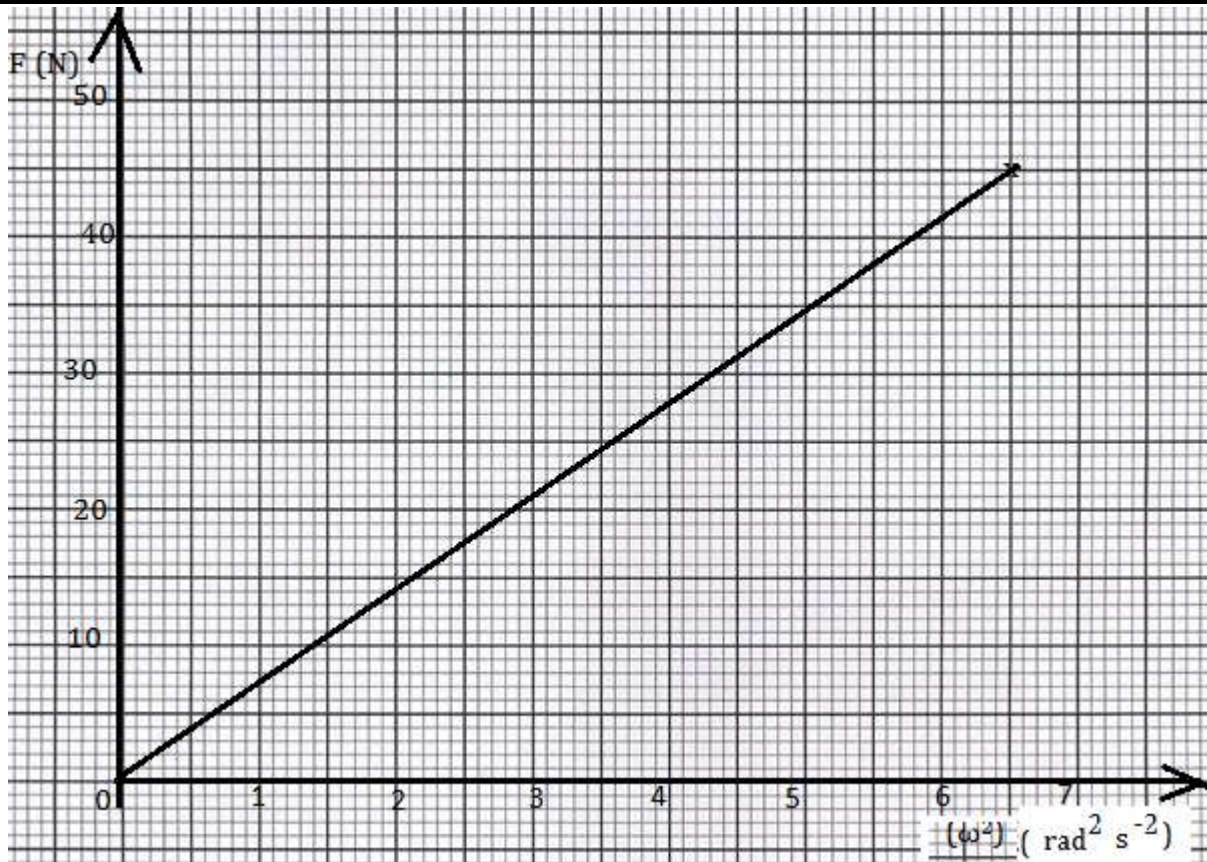


- If the tension in the rope is 160N, determine the weight of the rod. **(2 marks)**
10. Water flows through a tube of length 60cm and cross-sectional area 5cm^2 in 0.05 minutes. Calculate the mass flow in kg/s. (density of water = 1000kg/m^3). **(2 marks)**
11. Explain why two thin blankets are warmer than a thick one. **(1 mark)**
12. Distinguish between elastic collision and inelastic collision. **(1 mark)**

SECTION B (55 MARKS)

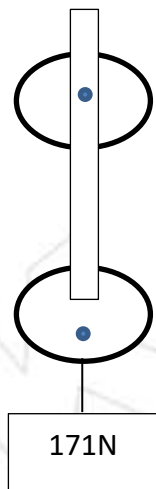
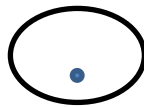
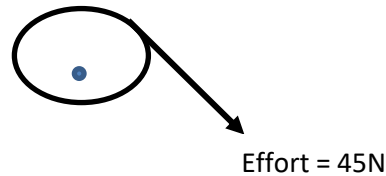
Answer ALL questions in the spaces provided.

13. (a) Define angular velocity. **(1 mark)**
- (b) State the reason why a body in uniform circular motion is said to be accelerating. **(1 mark)**
- (c) The graph of centripetal force against the square of angular velocity (ω^2) is plotted as shown below.



- (i) From the graph determine the slope. (2 marks)
- (ii) Given that $F = mr\omega^2$; determine m when $r = 1.23\text{m}$. (2 marks)
- (iii) Determine the angular velocity attained when a force of 16N is applied. (2 marks)
- (d) An elastic spring of a spring constant 500N/m is compressed to give an extension of 10cm. A marble of mass 10g is placed on the spring and then released. Determine the velocity with which the marble will move. (3 marks)
- (e) A brick of mass 80kg is pulled along a horizontal surface with uniform velocity by a force of 60N. Determine the co-efficient of friction between the two surfaces? (2 marks)
- 14.(a) State the law of conservation of energy. (1 mark)
- (b) Complete the diagram below by showing how the string is connected for the effort of 45N to be applied to raise a load of 171N through a height of 5m. (1 mark)





(c) From the block and tackle system shown in (b) above, determine;

(i) the velocity ratio. (1 mark)

(ii) the work done on the load. (2 marks)

(iii) the work input. (2 marks)

(iv) the efficiency of the system. (2 marks)

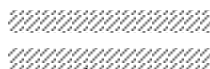
(v) Why is the efficiency of the machine less than 100%? (2 marks)

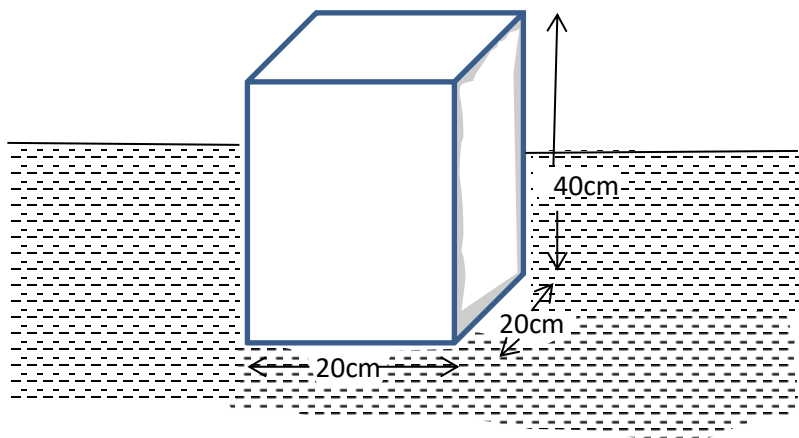
(vi) It is observed that the efficiency of the machine increases when it is used to lift large loads.

Give a reason for this. (1 mark)

15.(a) State Archimede's principle. (1 mark)

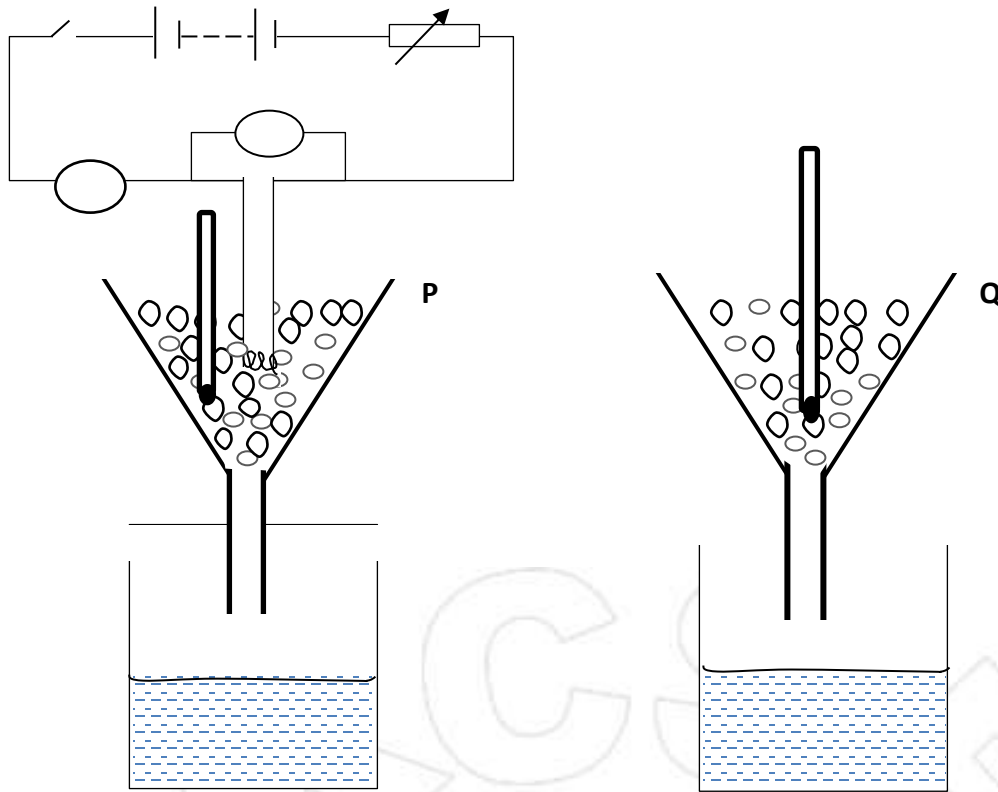
(b) The following set-up shows a metal block of density $11,500 \text{ Kg/m}^3$ and dimensions $40\text{cm} \times 20\text{cm} \times 20\text{cm}$ suspended inside a liquid with $\frac{3}{4}$ of its volume submerged in the liquid. The block is held in position by a string attached to a point above the liquid.



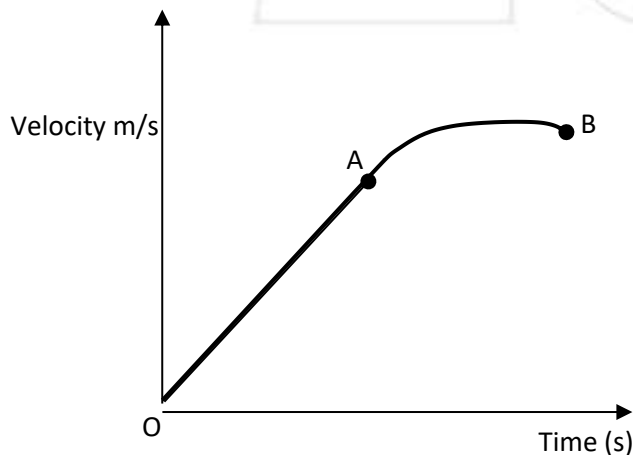


- (i) Determine the weight W of the block. (2 marks)
- (ii) If the tension on the string is 1684N, determine the upthrust U of the liquid. (1 mark)
- (iii) Determine the density of the liquid. (2 marks)
- (iv) If a liquid of density 1100kg/m^3 is poured on top of the liquid until the block is just submerged, determine the new tension in the string. (2 marks)
- (c) A hydrometer of mass 30g floats in oil of density 0.9g/cm^3 with 6cm of its stem above the oil. If the cross-sectional area of the stem is 0.5cm^2 , calculate the total volume of the hydrometer. (3 marks)
- 16.(a) Define specific heat capacity of a substance. (1 mark)

(b) The figure below shows a circuit that was used to determine the specific latent heat of fusion of ice by electrical method.



- (i) Complete the circuit diagram shown above. **(1 mark)**
- (ii) State the measurement to be carried out during the experiment. **(2 marks)**
- (iii) State the purpose of experiment Q. **(1 mark)**
- (c) Describe how the measurement taken can be used to determine the specific latent heat of fusion of ice. **(2 marks)**
- (d) A heater rated 300W was used to heat water from 0°C to 40°C . If the heating took 5 minutes; determine;
- (i) the heat capacity of water. **(2 marks)**
- (ii) the mass of water. (specific heat capacity of water $4.2\text{Jg}^{-1}\text{K}^{-1}$) **(1 marks)**
- 17.(a) The figure below shows a velocity – time graph of a body.



Describe the motion of the body between;

- (i) OA **(1 mark)**

(ii) AB

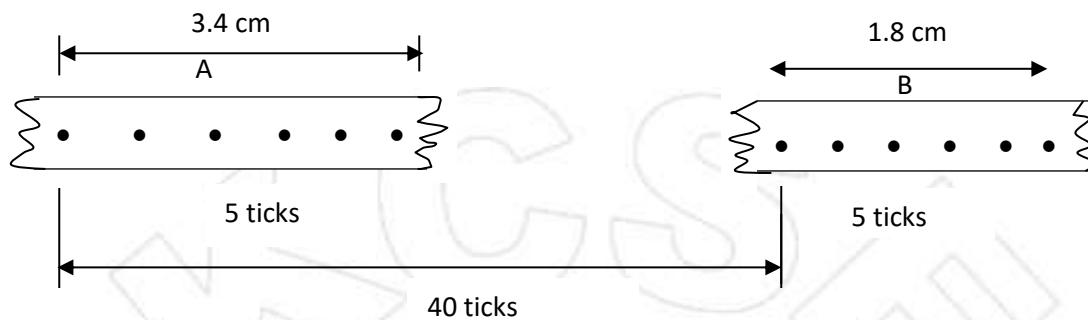
(1 mark)

(b) A simple pendulum is set swinging and the string is cut when the bob is at the centre of its oscillation and 8cm above the ground. If the velocity of the bob is then 2m/s;

(i) how long does the bob take to reach the ground? **(2 marks)**

(ii) how far does the bob travel horizontally. (Assume $g = 10\text{m/s}^2$) **(2 marks)**

(iii) A and B represents parts of the ticker tape of a trolley run. Each successive tick represents a time interval of $\frac{1}{50}$ th second.



(I) Find the initial velocity in region A.

(1 mark)

(II) Find the final velocity in region B.

(1 mark)

(III) Hence find the average acceleration of the trolley.

(1 mark)

KCSE 2025 TOP SCHOOLS' PREDICTIONS**EXPECTED EXAM 10**

232/2

PHYSICS**PAPER 2**

TIME: 2 HOURS

NAME.....

SCHOOL..... SIGN.....

INDEX NO..... ADM NO.....

*Kenya Certificate of Secondary Education.***Instructions to Candidates**

1. Write your name, index number, class and admission number in the spaces provided above.
2. This paper consists of **TWO** sections: Sections **A** and **B**.
3. Answer **ALL** the questions in sections **A** and **B** in the spaces provided.
4. **ALL** working **MUST** be clearly shown.
5. Mathematical tables and electronic calculators may be used.

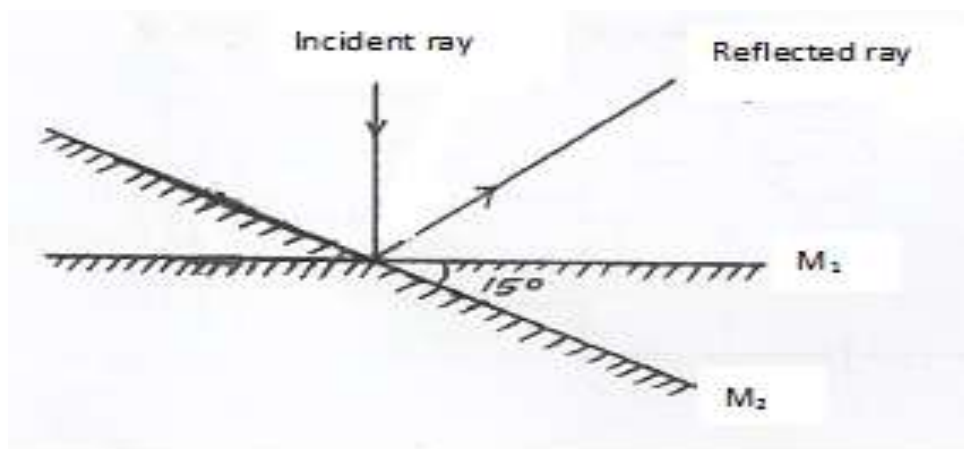
FOR EXAMINER'S USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12	25	
B	13	14	
	14	13	
	15	14	
	16	14	
TOTAL SCORE		80	

SECTION A (25 Marks)*For Marking Schemes Contact 0746-222-000 / 0753-222-000*

Answer all questions in the spaces provided

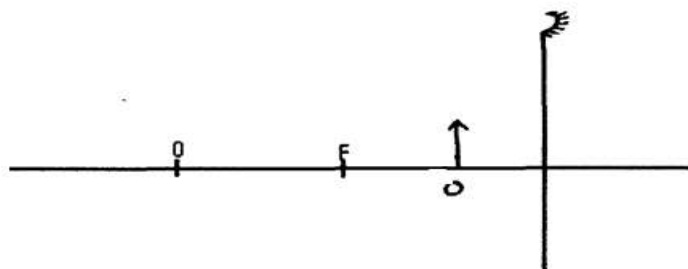
1. The figure below shows a ray of light incident along the normal. The mirror is rotated at an angle of 15° in a clockwise direction without changing the position of the incident ray,



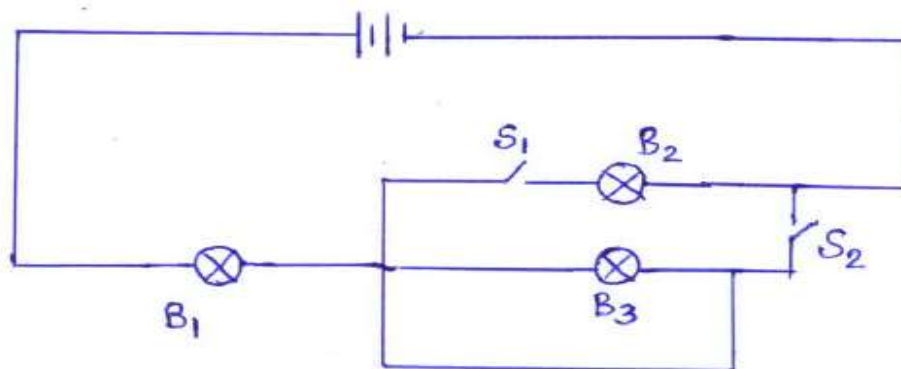
Determine the angle through which the reflected ray is rotated. **(2 marks)**

2. Describe how to charge a gold leaf electroscope positively by induction method using a polythene rod and a silk **cloth** **(2 marks)**

3. An object O is placed in front of a concave mirror as shown in the figure below. Complete the light ray diagram to locate the position of the image. **(3 marks)**



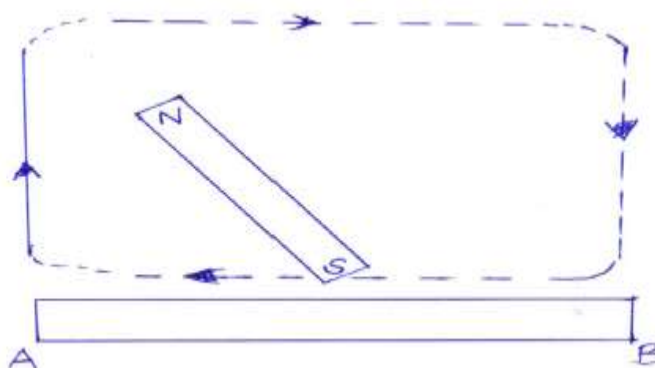
4. A student set up the circuit shown in figure below.



State the observation when;

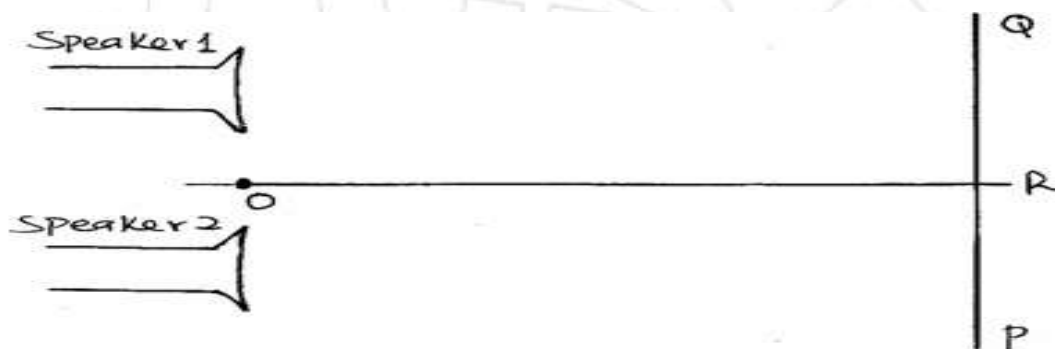
- Switch S_1 is closed **(1 mark)**
- If all switches are closed; compare the lighting between B_1 , B_2 and B_3 **(2 marks)**

5. State two ways of increasing the strength of an electromagnet. (2 marks)
6. The figure below shows one of the method used to magnetise a magnetic material



State the polarity of B. (1 mark)

7. Two identical loudspeakers are arranged as shown and connected to the same signal generator. Line OR is equidistant from the speakers.



- i. An observer moves along line PQ. State and explain the observation. (2 marks)
- ii. If the frequency of sound from the generator is increased, what effect does this have on the interval at which the observer hears the soft sound? (1 mark)
8. The figures below show the profiles of a transverse wave.

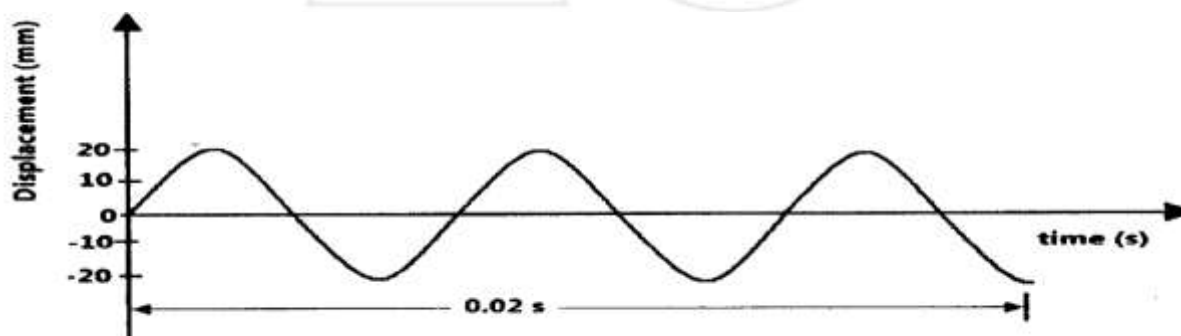
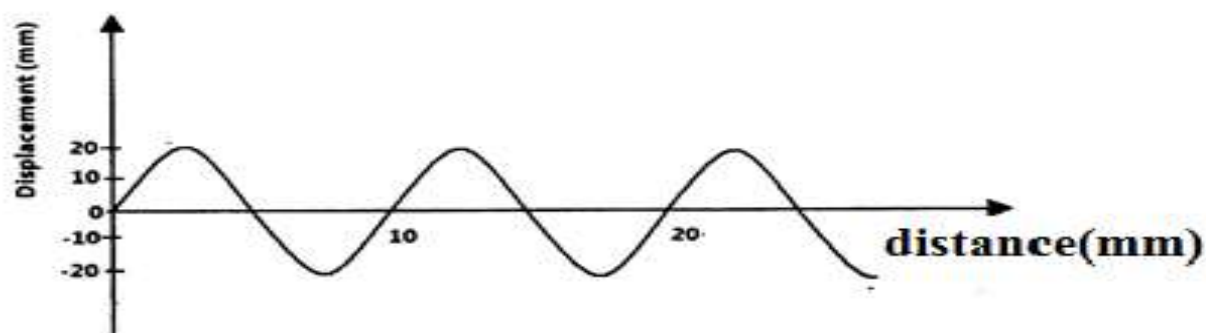


Figure 4



Determine for the wave the:

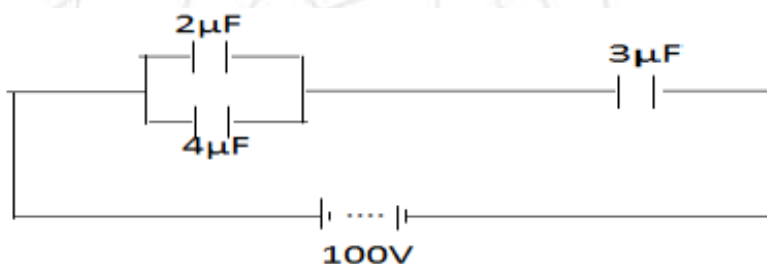
(i) Wavelength

(1mark)

(iii) Velocity

(2 marks)

9. The diagram below shows a capacitor network connected to a 100V supply.



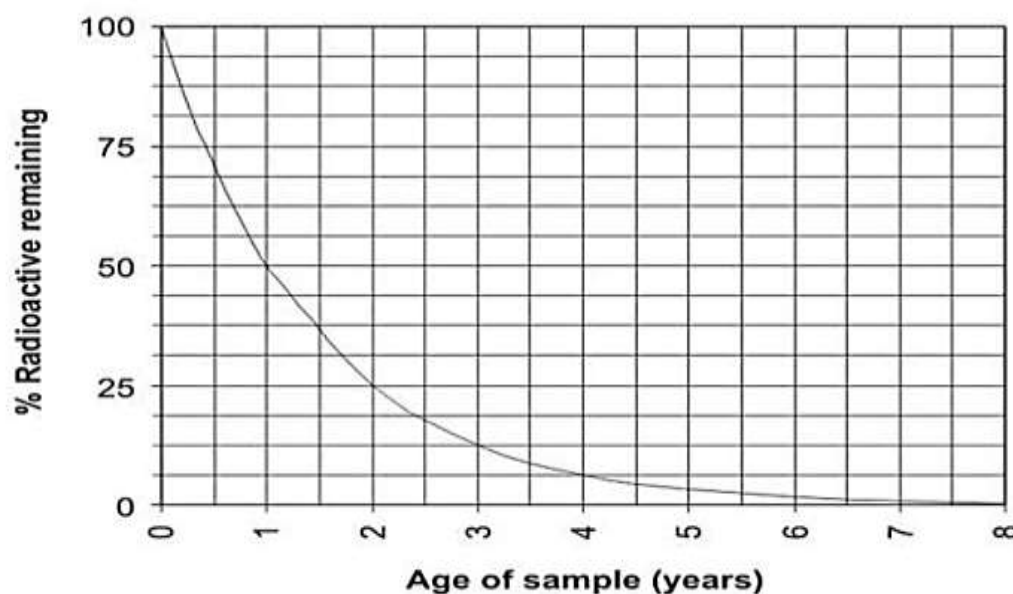
Calculate the total charge in the circuit.

(3 marks)

10. Define the term doping as applied in **electronics**

(1 mark)

11. The graph below shows the variation of percentage mass remaining against age in years of a certain radioactive substance



Determine the half-life of the source

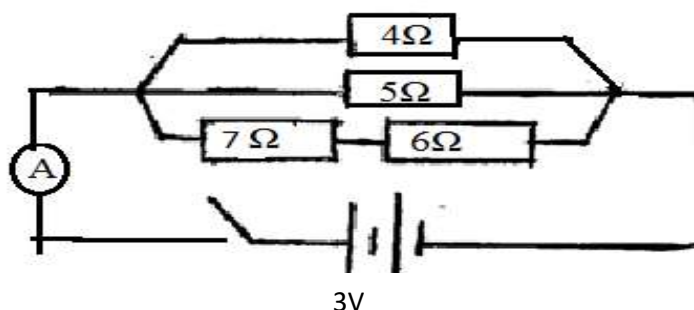
(1 mark)

12. State one difference between the Cathode ray tube of a television and that of a Cathode ray Oscilloscope. (1mark)

SECTION B (55 marks)

Answer all questions in the spaces provided

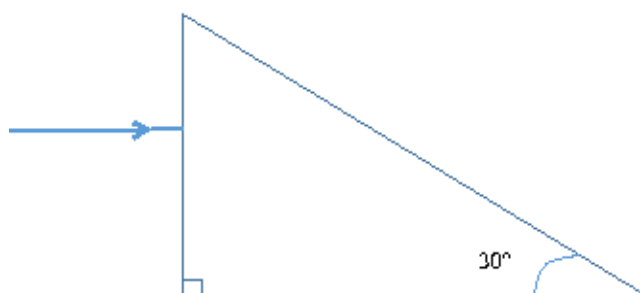
- 13 (a) State the Ohm's law (1mark)
- (b) You are provided with the following apparatus; a coil of nichrome wire, two dry cells, ammeter, voltmeter, connecting wires, switch and rheostat. (1mark)
- (i) Draw a circuit diagram that can be used to verify Ohm's law (1mark)
- (ii) State the measurements to be taken (2marks)
- (i) Describe how these measurements obtained can be used to verify Ohm's law (3marks)
- (c) Study the figure below and answer the questions that follow



Determine:

- (i) The combined resistance (3 marks)
- (ii) The total current flowing through the 6Ω resistor (2 marks)
- (iii) Voltage across the 7Ω resistor (2marks)
- 14 (a) Define critical angle (1mark)
- Crown has a refractive index of 1.55. Determine its critical angle. (3 marks)

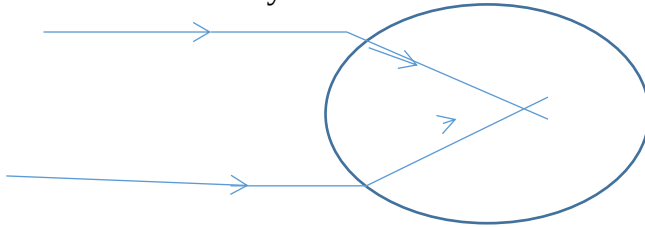
- (b) A ray of light strikes the crown prism in (b) above as shown below.



- Trace the path of the ray till it emerges (show your working above) (3 marks)

(c) Using a well labeled diagram, show how you would use a converging lens as a simple microscope
(3 marks)

(d) The figure below shows an eye defect.

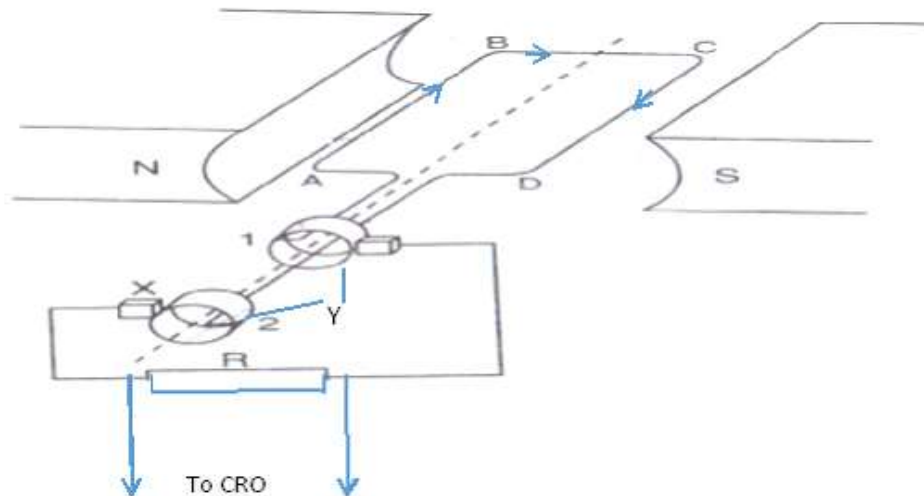


(i) Name the defect shown above (1 mark)

(ii) On the same diagram show how you can correct the above defect (2 marks)

15. (a) State the Lenz's Law (1 mark)

(b) The diagram below shows a simple generator



(i) Name the parts labeled; (I) X (1 mark)

(II) Y..... (1 mark)

(ii) On the diagram, show the direction of rotation, such that the current flows in the direction indicated by the arrows (1 mark)

(iii) State two ways of making the generator produce more current (2 marks)

(iv) On the axes below, sketch the graph of the output voltage for two complete cycles if the C.R.O is connected as shown (1 mark)



- (v) Explain how you would modify the generator above to produce d.c. **voltage** (1 mark)
- (c) A power line supplies electrical energy to a transformer in a factory. The input voltage to the transformer is 11000V. The transformer changes voltage to 415V for use in a factory. The power input to the transformer is 40KW. Calculate the current in the secondary coil of the transformer if the transformer is 90 percent efficient. (3 marks)
- (d) A Form four student spent the April holiday at home and used the following electrical appliances per day:-
 8KW cooker for 1 hour,
 40W study bulb for 12 hours
- (i) Find the total monthly bill for the above household if the power company charges ksh. 2.50 per unit if in addition to the energy consumed, the power company charges each consumer.
- I A standing charge of Ksh.200.
 II Fuel cost levy at 70 cents per unit. (3 marks)
- 16 (a) Apart from the intensity of light, state two other factors which affect photoelectric effect. (2 marks)
- (b) A material has a work function of 2.9eV. The wavelength of an incident radiation on its surface is 2.9×10^{-7} m. (Given that; $C = 3.0 \times 10^8$ m/s, $h = 6.63 \times 10^{-34}$ Js, $1\text{eV} = 1.6 \times 10^{-19}$ and mass of an electron = 9.11×10^{-31} kg).
- (i) Determine frequency of incident radiation (2 marks)
 (ii) Determine the stopping potential. (3 marks)
 (iii) Determine the speed of the emitted electrons (3 marks)
- (c) (i) State how you can increase the strength of X- rays (1 mark)
 (ii) Give one application of X- rays in industry. (1 mark)
 (iii) Give reason why the X- ray tube is evacuated. (1 mark)
 (iv) State why the anode is made of copper (1 mark)

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SUCCESS

POLITE NOTE TO 2026 KCSE CANDIDATES

In the event that any of these revision questions closely match or appear in the upcoming national examinations, please stay composed.

Do not panic, and approach your papers with confidence.

BEST OF LUCK IN YOUR EXAMS!

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