NAME: …… **INDEX** NO ……..….....

SCHOOL …… **CANDIDATE'S SIGN** ……..…...

DATE: ……..……

232/1
PHYSICS
PAPER 1
JULY/AUGUST-2015
TIME: 2 HOURS

KAKAMEGA JOINT EVALUETION TEST 2015

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

232/1
PHYSICS
PAPER 1
JULY/AUGUST-2015
TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

- Write your **name** and **index number** in the spaces provided above
- This 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 ; marks may be awarded for correct steps even if the answers are wrong
- Mathematical tables and silent electronic calculators may be used.

FOR EXAMINER'S USE ONLY:

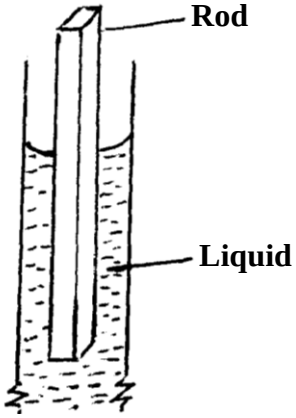
SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1- 13	25	
	14	11	
	15	12	
	16	12	
	17	09	
	18	11	
	TOTAL		

This paper consists of 9 printed pages.
Candidates should check the question paper to ascertain all the pages are printed as indicated

And no questions are missing.

SECTION A (25 MARKS)

1. A uniform rod of length 30cm and cross section area 2cm2 floats in a liquid with two thirds of its length submerged as shown in the figure below.



Given that the mass of the rod is 35g, calculate the density of the liquid. (3marks)

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2. Name **two** types of forces that act between bodies not in contact. (2marks)

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3. Calculate the maximum pressure a glass block of density 2.5gcm^{-3} would exert on a horizontal surface, if the block measures 20cm x 10cm x 5cm. (3marks)

4. Give a reason why fish can survive under water in a pond even when the surface is frozen. (1mark)

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5. Give **one** advantage of alcohol over mercury as a thermometric liquid. (1mark)

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6. Two inflated balloons are at the same level while suspended from two threads a short distance apart. Some air is blown gently between the balloons in a horizontal direction. State and explain the observation made. (2marks)

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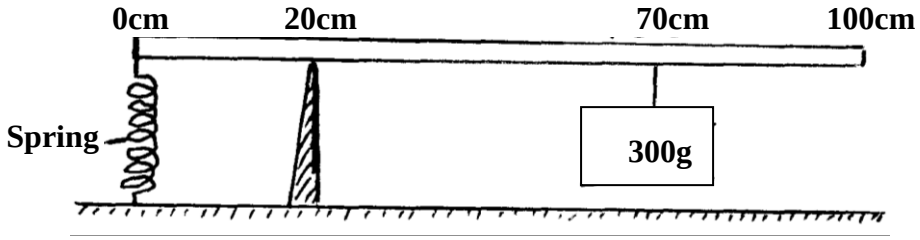
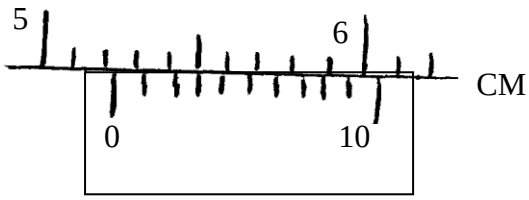
7. The figure below shows a uniform metal rod of mass 100g balanced over a pivot using a spring balance and a mass of 300g.



Calculate the tension in the spring. (3marks)

8. The figure below shows part of the scale of a vernier callipers. What is the reading indicated by the scale? (1mark)



9. A force of 4N produces an extension of 6cm in a spiral spring. Calculate the extension produced by two such identical springs arranged in series and supporting a force of 3N. (Neglect weight of the springs) (3marks)

10. What is Brownian motion? (1mark)

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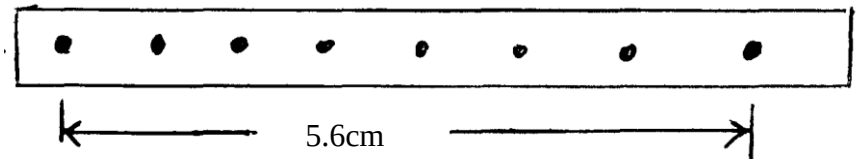
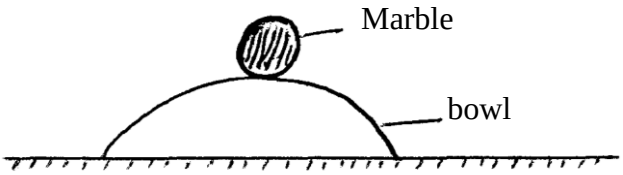
11. The figure below shows dots made by a ticker-tape timer of frequency 50Hz on a tape pulled by a trolley.



Calculate the average velocity of the trolley. (2marks)

12. A tank for storing gas has a safety valve that opens when pressure reaches $l0^6$pa. It contains gas at a pressure of 8.0 x $l0^5$pa at 15°C. At what temperature will the valve open? (3marks)

13. In which sate of equilibrium is the marble below? (1mark)



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SECTION B (55 MARKS)

14. (a) An object at rest is dropped from a height of 80m.

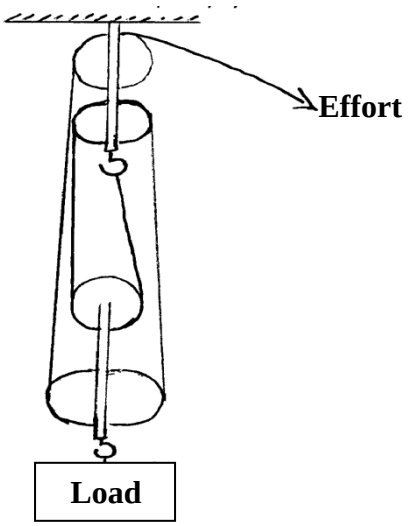
(i) Sketch a velocity-time graph for the object. (2marks)

(ii) Determine how long it takes to reach the ground (3 marks)

(iii) Determine the velocity as it hits the ground. (3marks)

(b) A car of mass 1.5 x $l0^3$kg moving at 20ms^{-1} collides with another stationary car. They both move at 5ms^{-1} after collision. Find the mass of the second car. (take g = 10N kg^{-1}) (3marks)

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



(i) Determine the velocity ratio of the system. (1mark)

(ii) If an effort of 35N raises a load of 105N, determine the efficiency of the system. (3marks)

(b) A 2kg block falls from top of a building 20m high. Determine:

(i) The potential energy lost by the block. (2marks)

(ii) The kinetic energy gained by the block (1mark)

(iii) The velocity of the block when it hits the ground. (2marks)

(iv) Time taken by the block to hit the ground. (Take g =l0Nkg^{-1}) (3marks)

16. (a) Beaker A contains 200g of water at 0°C while beaker B contains 200g of ice and water at 0°C. Two identical metal blocks are removed from a hot furnace. One block is dropped into beaker A while the other is dropped into beaker B at the same time. Explain why more water evaporates from beaker A than from beaker B. (2marks)

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(b) Define the term specific latent heat of vaporization. (1mark)

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(c) In an experiment to determine the specific latent heat of vaporization of water, steam at 100°C was passed into water at 24^{o}C contained in a well lagged copper calorimeter. The following measurements were made;

Mass of calorimeter = 50g

Initial mass of water = 70g

Final mass of water + calorimeter + condensed steam = 123g
Final temperature of mixture = 48^{o}C
I. Determine:
(i) Mass of condensed steam. (2marks)

(ii)Heat gained by the calorimeter and water. (2marks)

II. Given that L_v is the specific latent heat of vaporization of steam,
(i) Write an expression for the heat given out by steam. (2marks)

(ii) Determine the value of L_v. (3marks)

(Take: specific heat capacity of water = 4200Jkg^{-1}k-^{1}and specific heat capacity of copper = 390Jkg^{-1}k-^{1})

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

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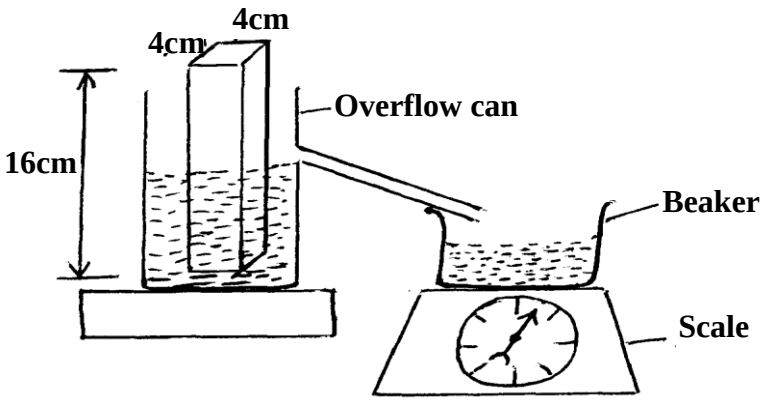
(b) The figure below shows a block of dimensions 4cm by 4cm by 16cm immersed in a liquid in an overflow can with 3/4 of its height submerged.

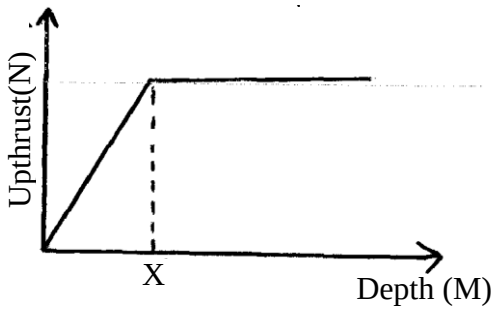


Given that the mass of the beaker when empty is 85g and the reading on the scale in the set up above is 245g, calculate:

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

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

(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. (2marks)

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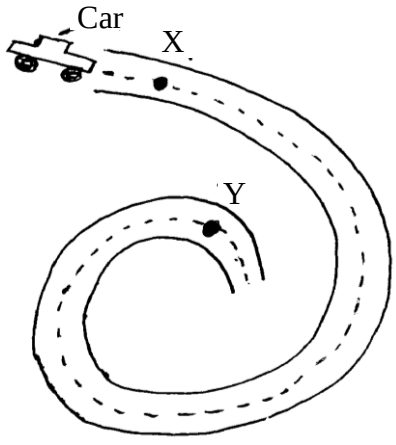
18. (a) The figure below shows a car of mass (m) moving along a curved part of the road with a constant speed.



(i) Explain why the car is more likely to skid at V than at X. (2rnarks)

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(ii) If the radius of the road at V is 250m and the car has a mass of 6000kg, determine the maximum speed at which the car can be driven while at V without skidding. Force of friction between the road and the tyre is 18000N. (3marks)

(b) A string of length 0.7m is used to whirl a stone of mass 500g in a circle in a vertical plane at 5 rev/s.

Determine:

(i) The period (2marks)

(ii) The angular velocity. (3marks)

(c) A body moving in a circle with constant speed is said to have an acceleration. Explain. (1mark)

NAME……..…… …… INDEX NO:…….
CANDIDATE'S SIGNATURE ……
DATE: ……..……

232/2
PHYSICS
THEORY
PAPER 2
JULY/AUGUST-2015
TIME: 2 HOURS

KAKAMEGA CENTRAL SUB-COUNTY JOINT EVALUATION EXAM -2015

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

232/2
PHYSICS
THEORY
PAPER 2
JULY/AUGUST-2015
TIME: 2 HOURS

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*** the questions in section **A** and **B** in the spaces provided.
- All working ***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.
- Take gravitational acceleration =10m/s^2 and π=3.142

FOR EXAMINERS' USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12	25	
B	13	09	
	14	13	
	15	10	
	16	12	
	17	11	
	TOTAL	**80**	

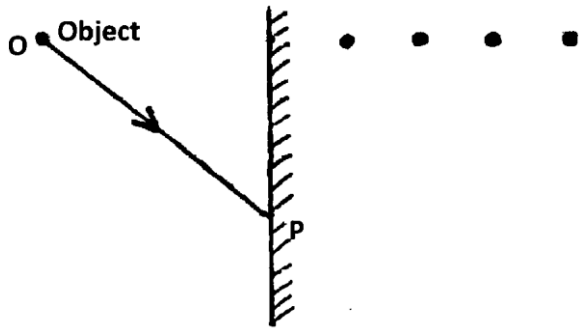
This paper consists of 8 printed pages.
Candidates should check the question paper to ascertain all the pages are printed as indicated

And no questions are missing.

SECTION A (25 MARKS)

Answer ALL questions in this section in the spaces provided

1. Figure below shows an object **O** placed in front of a plane mirror. A ray of light is drawn coming object **O** and striking the mirror at **P**. After striking the mirror, the ray of light is reflected.



(i) Which of the four dots represent correct position of the image of **O**? Label this dot **Q** (1mark)

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(ii) By drawing a line on the diagram above to represent the reflected ray at P, mark the angle of reflection and label it **r**. (1mark)

2. (i) State the characteristics of images formed by a pinhole camera. (2marks)

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(ii) What is the effect on the image when the camera is elongated? (1 mark)

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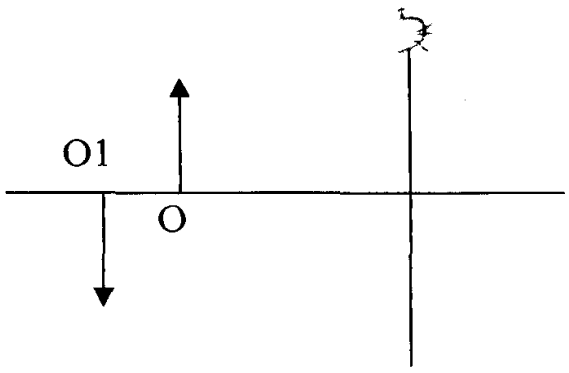
3. The figure below shows the object O and its image O1 formed by a concave mirror. Locate the position of the principle focus. (2marks)



4. An electromagnet is made by winding insulated copper wire on an iron core. State three changes that could be made to increase the strength of the electromagnet. (3 marks)

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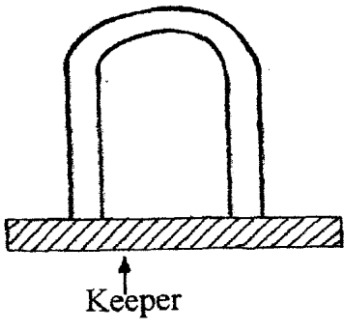
5. Figure below shows a U-shaped magnet stored with a keeper.



Explain how this method helps to retain magnetism longer. (2marks)

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6. State the energy transformation when fast moving electrons are suddenly stopped by a target in an x-tray tube. (1mark)

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7. A current of 1 3A flows through a heating element of resistance 8.5Ω for 1.5 minutes. Calculate the quantity of heat supplied. (3marks)

8. Give a reason why it is not advisable to smoke a cigarette near a charging battery. (1mark)

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9. State the dynamo rule. (1mark)

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10. Radio X is broadcast on wavelength I 50m at a frequency of 200 kHz. Calculate the velocity of the radio waves. (2 marks)

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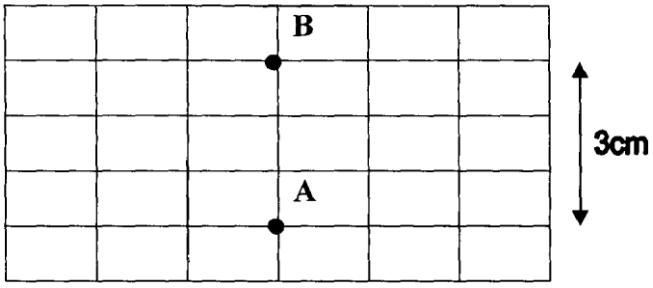
11. Draw a diagram to illustrate the correction of myopia. (2marks)

12. The figure below shows the displacement of a spot on a cathode ray oscilloscope screen.



The spot appears on the CRO at position A. When DC voltage is applied to Y-plates the spot is displaced to position B. The Y-gain is set at 20 V/cm.

(i) State the type of voltage applied. (1mark)

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(ii) Find the voltage applied. (2marks)

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SECTION B (55 MARKS)

Answer ALL questions in this section in the spaces provided

13. (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.

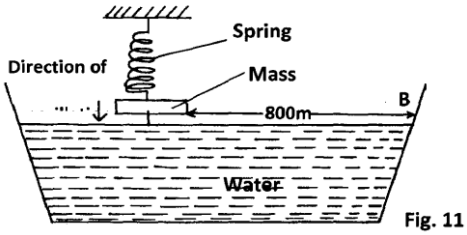

Fig. 11

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

Determine;

(i) The periodic time of the mass. (2marks)

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(ii) The frequency of the waves produced on the water surface (1mark)

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(iii) The speed of the waves if the students counted four ripples between the mass and end **B** of the tank (3marks)

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(b) 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 (2marks)

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(ii)When the ship above passes over a sunken reef, the echo sounder receives an echo after 0.1 6s. Determine the height of the sunken reef (2marks)

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14. (a) (i) State the basic law of electrostatics. (1mark)

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(ii) In testing for the sign of charge on a body, explain the behaviour of a positively charged electroscope when charged bodies are brought closer to the electroscope. (2marks)

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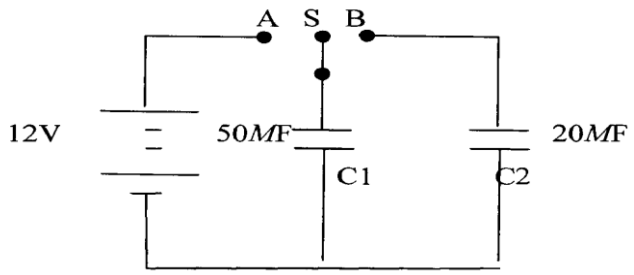
(b) The figure below shows an arrangement which may be used to charge a capacitor of capacitance 50*MF* and then to connect it to a capacitor of capacitance 20*MF*.



(i) The switch S is first placed at position A, so that the capacitor C, is connected to the 12V dc supply. Calculate the charge stored in the capacitor. (3marks)

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(ii) The switch S is now changed to position B. Calculate the final potential difference across the capacitors. (3marks)

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15. (a) State the conditions to be satisfied for total internal reflection to occur. (2marks)

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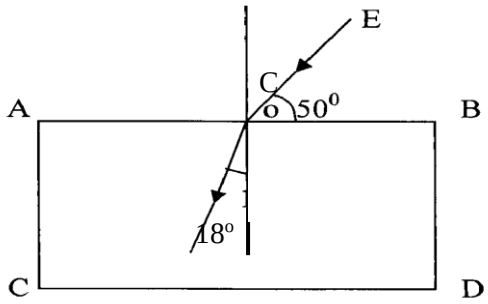
(b) A ray of light traveling in the direction EO in air enters a rectangular block as shown in the diagram. The resulting angle of refraction is 18°.



Find:

(i) The refractive index of the block. (2marks)

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(ii) The critical angle C of the block. (3marks)

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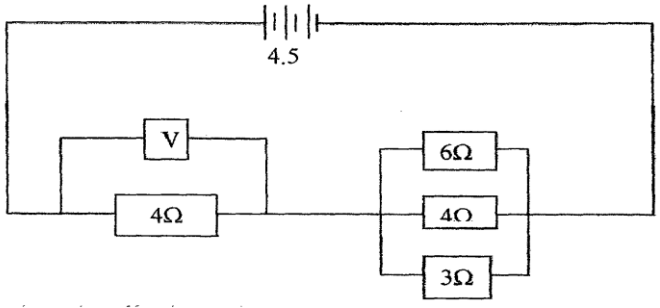
16. (a) Study the circuit diagram below and answer the questions that follow.

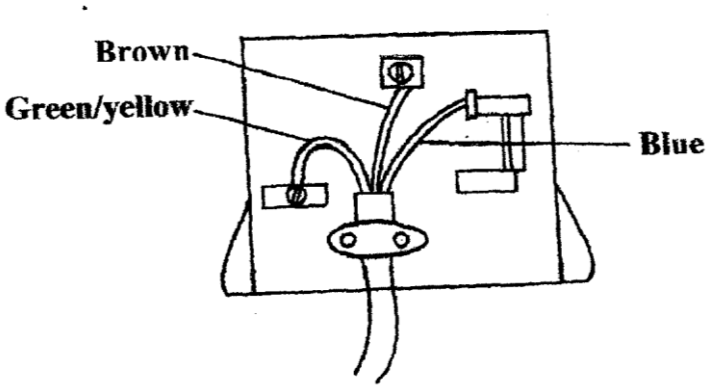


(i) Calculate the effective resistance of the circuit. (3marks)

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

(b) A cell drives a current of 3.2A through a 2.8Ω resistor. When it is connected to 1 .6Ω resistor, the current that flows is 5A. Find the e.m.f. (E) and internal resistance of the cell. (3marks)

17. (a) The figure below shows a connection to the three pin plug.



(i) Identify **two** mistakes in this wiring. (2marks)

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(ii) What would happen if this plug was connected to the mains of the socket? (1 mark)

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(iii)State **two** reasons why the earth pin is normally longer than the other two pins. (2marks)

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(b) A house has five rooms with 240V, 60W bulbs. If the bulbs are switched on from 7.00p.m. to 10.30p.m.

(i) Calculate the power consumed per day in Kilowatt-hours. (3marks)

(ii) Find the cost per week for lighting these rooms at Kshs. 6.70 per unit. (2marks)

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

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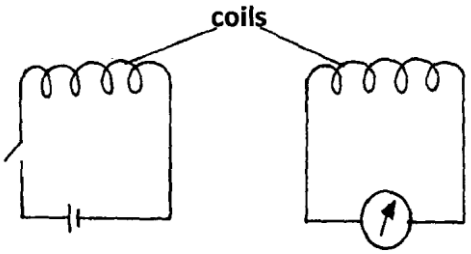
(b) The figure below shows two circuits close to each other.



When the switch is closed, the galvanometer shows a reading then returns to zero. When the switch is open, the galvanometer shows a reading in the opposite direction and then returns to zero. Explain these observations. (2marks)

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(c) A transformer is connected to a 12.0V, 30.0W lamp from the 240V main. If the transformer is 75% efficient, determine the mains current. (3marks)

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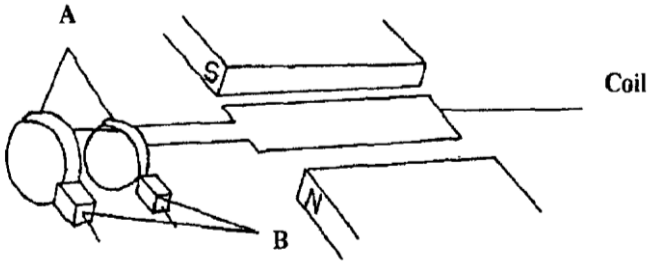
(d) The figure below shows an a.c generator



(i) Label the parts **A** and **B** (2marks)

A ……

B……

(ii) Explain clearly how this type of generator works. (2marks)

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NAME: ……..…… **INDEX** NO ……..…..…..

SCHOOL ……..…..**CANDIDATE'S SIGN** ……....……

DATE: ……..……

232/3
PHYSICS
PAPER 3
PRACTICLES
JULY/AUGUST-2015
TIME: 2 ½ HOURS

KAKAMEGA CENTRAL SUB-COUNTY JOINT EVALUATION EXAM - 2015

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

232/3
PHYSICS
PAPER 3
PRACTICLES
TIME: 2 ½ HOURS

INSTRUCTION TO ALL CANDIDATES

- Write your **name** , **School** and **Index number** in spaces provided
- Answer all the questions in the spaces provided in the spaces provide in the the question paper
- You are required to spend the first 15 minutes of the 2 ½ hrs allowed for this paper reading carefully the whole paper before commencing your work
- Marks for their suitability, accuracy and the use of them
- Mathematical tables and electronic calculators may be used.

FOR EXAMINERS USE ONLY

QUESTION I	20	
QUESTION II	20	
GRAND TOTAL	**40**	

This paper consists of 6 printed pages.
Candidates should check the question paper to ascertain all the pages are printed as indicated And no questions are missing.

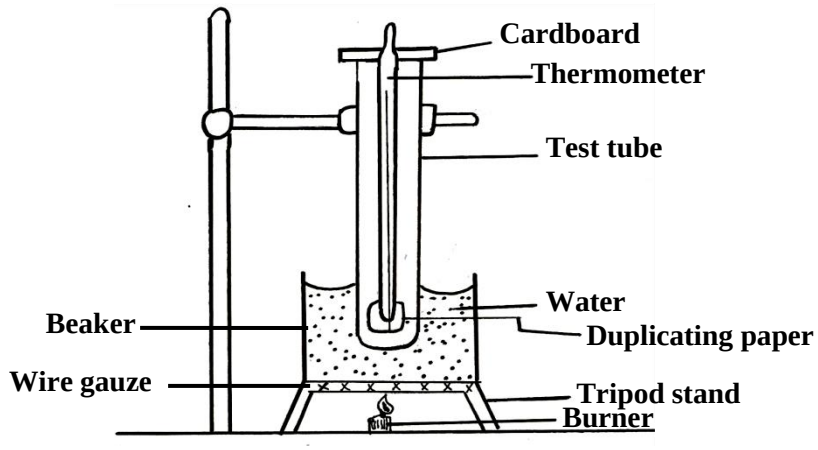
QUESTION 1

1) You are provided with the following;

- A retort stand, boss and clamp
- Test tube
- Piece of duplicating paper
- A thermometer
- A large beaker containing some water
- A tripod stand and wire gauze
- A cardboard with a hole in the middle
- A burner
- A rubber band
- A stop band
- A stop watch

Proceed as follows;

a) Set up the apparatus as shown below



b) Heat the water in the beaker provided and leave it to boil

c) Wrap the given piece of duplicating paper round the bulb of the thermometer. Use rubber band to hold the paper in place

d) Place the thermometer inside in the dry test tube

e) Place the test tube in the water as shown in the diagram above. Make sure that the water does not enter the test tube. Leave the test tube in the boiling water until the thermometer indicates a steady temperature.

f) Remove the thermometer and immediately start the stop watch

g) While holding the thermometer in air record the readings of the thermometer.
T_1 at intervals of 30 seconds for 10 minutes

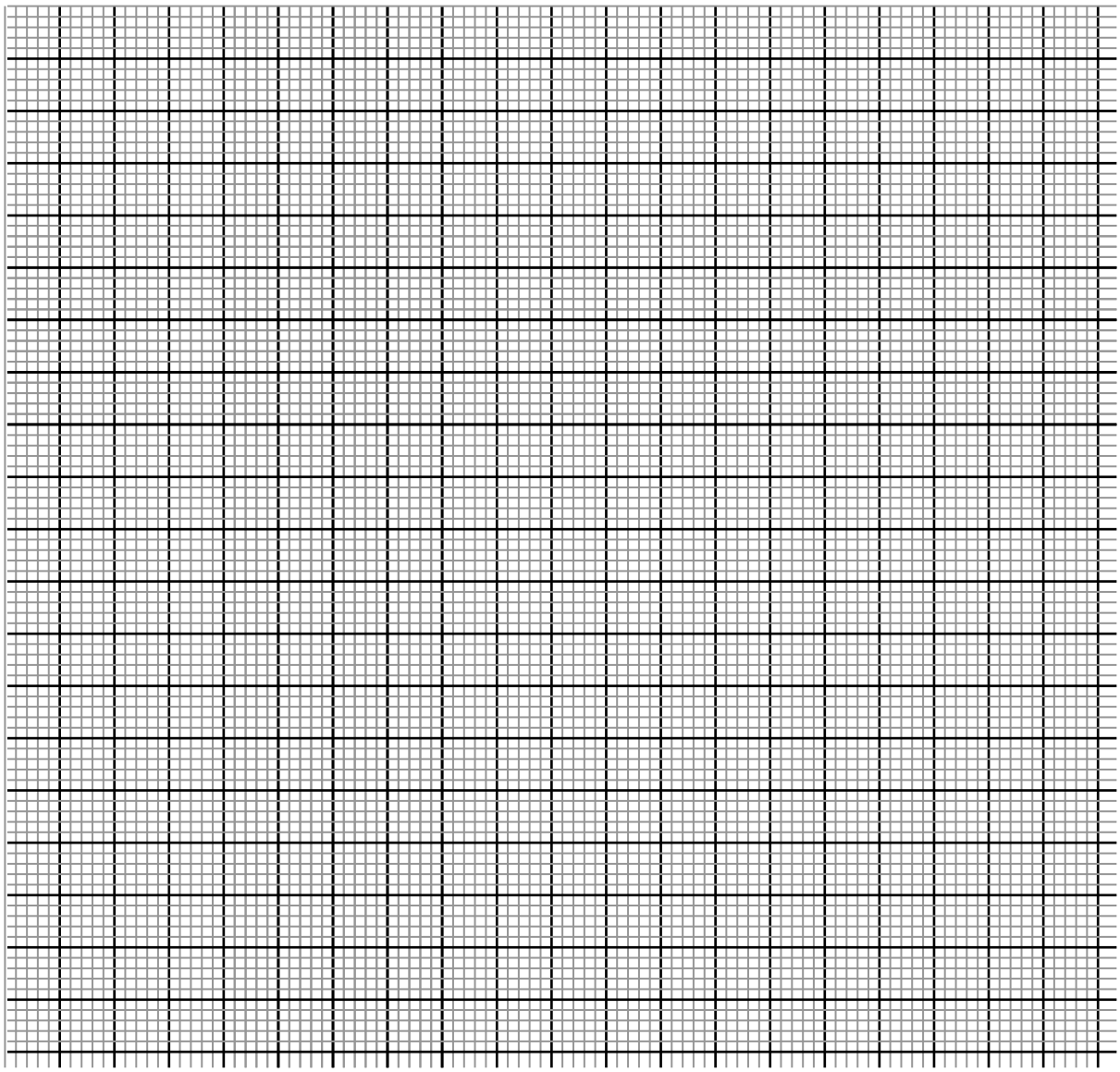
Time in minutes	0	0.5	1.0	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
T1 (^oC)											
T2 (^oC)											

Time in minutes	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
T1 (^oC)									

h) Place the wrapped thermometer directly into boiling water. Leave the thermometer in the boiling water until it indicates a steady temperature.

i) Repeat procedure (f) and (g) and record the reading T_2 of the thermometer in the table at half minute intervals for 5.5 minutes.

j) Using the same axes on the grid provided, plot a graph of temperature (y-axis) against time for results obtained in (g) and (i) (labell the graph T1 and T2)



k) From the graphs determine;

i) For each graph the time for temperature to fall from 60^{o}C to 40 ^{o}C (1mk)

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ii) Find the ratio of the two times in k (i) above (1mk)

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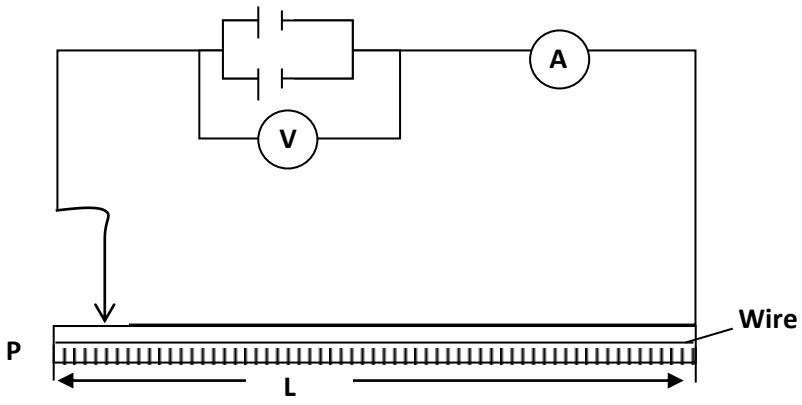
QUESTION 2

a) You require;

- Two dry cells (size D)
- A two cell holder
- A voltmeter
- An ammeter
- Mounted resistance wire on a mm scale
- 7 connecting wires (3 with crocodile clops)
- Vernier calipers (to be shared among five students

Proceed as follows

i) Set the circuit as shown in figure below



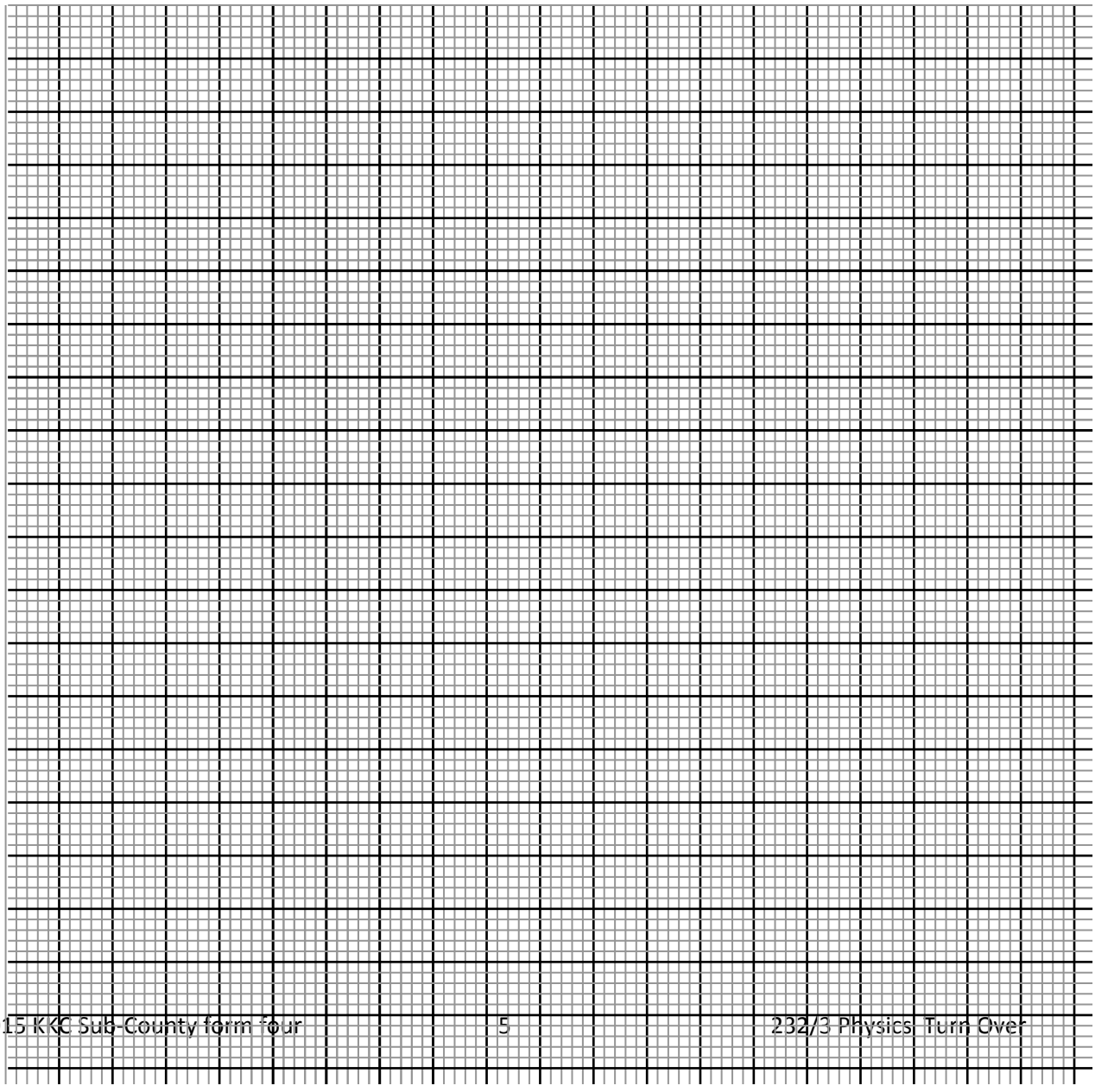
ii) With the crocodile clip at P (i.e. L= 100cm) take the voltmeter reading V and the ammeter reading I. Repeat the procedure for values of L=90, 70, 50, 40 and 20cm respectively Record your reading in table below

L (cm)	L(m)	V	I	V/I
100				
90				
70				
50				
40				
20				

iii) a) With the same apparatus design a circuit to determine the e.m.f of the two cells (1mk)

b) Measure the e.m.f of the cells _____ (volts) (1mk)

iv) Plot a graph V/I (ohms) against L (metres)



v) Calculate the slope S of the graph (3mks)

vi) Measure the diameter d of the mounted resistance wire (1mk)

d= ……mm=……..metres

vii) Given that $S = \pi d^2 /4h$. Calculate the value of h (2mks)