NAME: ---------- **INDEX NO:** ----------

SCHOOL: ---------- **TIME:** ----------

232/2
PHYSICS
PAPER 2
JULY/AUGUST- 2013
TIME: 2 HRS

LARI SECONDARY SCHOOLS JOINT- DISTRICT MOCK
KENYA CERTIFICATE OF SECONDARY EDUCATION
PHYSICS PAPER 2

INSTRUCTION TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Sign and write the date of examination in the spaces provided.
- Answer all the questions in section A and B in spaces provided.
- All working MUST be clearly shown.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINER USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12	25	
B	13	11	
	14	11	
	15	9	
	16	12	
	17	12	

SECTION A (25MARKS)

Answer all the questions in this section

1. The figure (1) below shows two rays of light from an object reflecting on a plane mirror

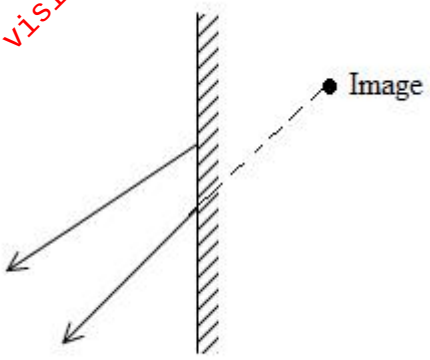

Fig 1.

Using proper ray construction, show the object position (2marks)

2. A convex mirror of focal length 18cm produces an image on its axis, 6cm away from the mirror. Determine the position of the object.(2marks)

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3.The diagram on figure 2 shows the National Grid system.

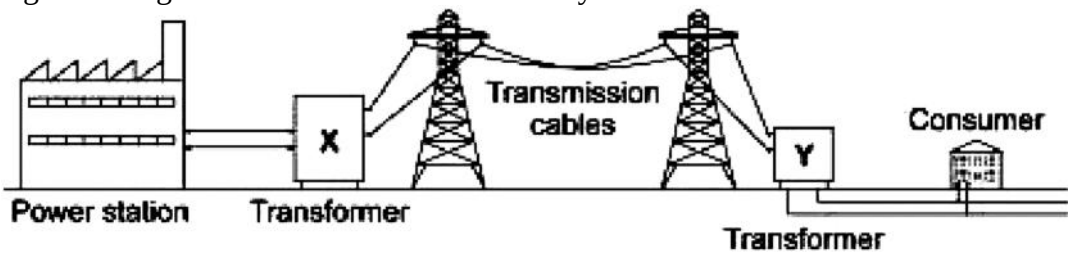

Fig2.

(a) What type of transformer are transformers

X…… (1mark)

Y……. (1mark)

4. State two advantages of using circuit breakers in the consumer unit than using fuse wire. (2marks)

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5.A student connects a series circuit as shown in figure 3 below.

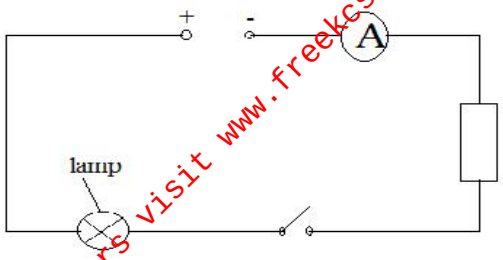

Fig3.

b) You are asked to connect a second lamp so that each lamp can be switched on and off independently. Show by drawing on the circuit above, how this can be done.

6. Figure 4. Below shows a 6V battery connected to an arrangement of resistors. Determine the current flowing through the 2Ω resistor. (3marks)

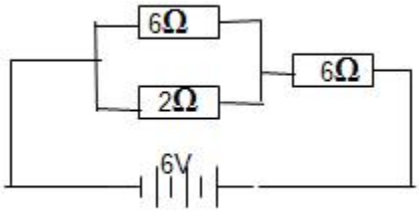

Fig 4.

7. The figure 5 below shows the electromagnetic spectrum.

Radio waves	Infra-red	A	Ultra violet	B	Gamma rays

Fig 5.

(a)Identify A (1 mark)

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(b)State one industrial use of B (1 mark)

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8. The diagram (Fig 5) shows a positively charged acetate strip and a negatively charged polythene strip that are freely suspended.

Fig5.

Two rods X and Y are brought up in turn to these two strips. Rod X attracts the acetate strip but repels the polythene strip. Rod Y does not repel either the acetate strip or the polythene strip. State the type of charge is on each rod (2marks)

X…….

Y……

9. The control grid in a CRO is used to control the brightness of the beam on the screen. Explain how this is achieved. (2marks)

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10. Figure 6 below show a **concave** lens and object.

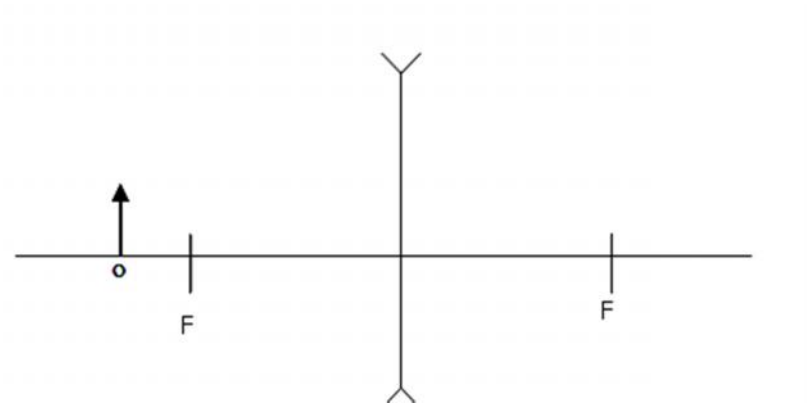

Figure 6.

Sketch the rays to show the image formed. (2marks)

11. Two similar razor blades were placed on a wooden block and the other on an iron block as in figure 7.

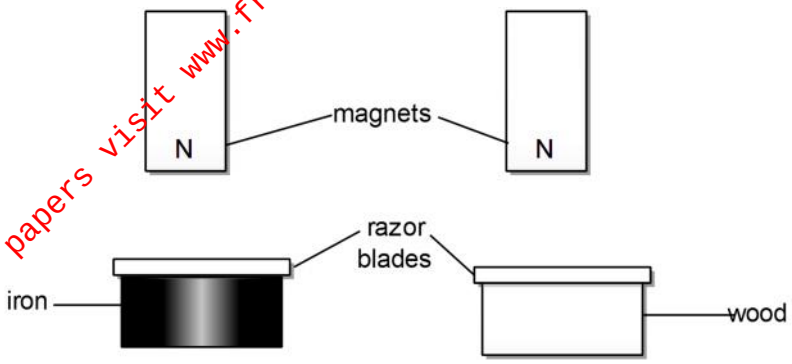

Fig 7.

It was observed that the razor blade on the wooden block is attracted by the magnet while that on the iron block was not.Explain.(2 marks)

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12. The figure 8 below shows water waves about to pass through a gap. One wave front is shown after it has passed through the gap.

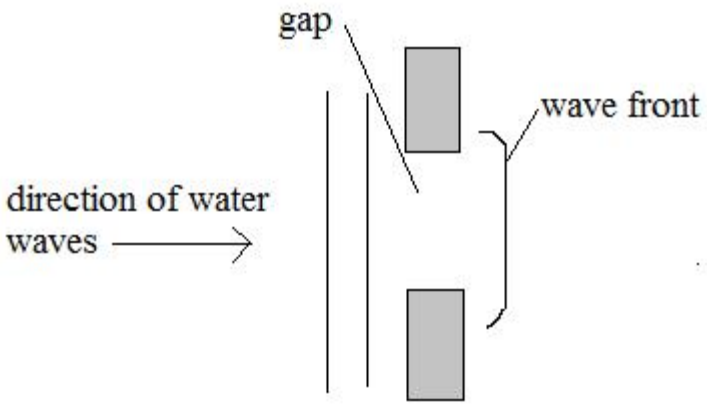

Fig 8

(i) On the diagram, draw two more wave fronts that have passed through the gap.(1mark)

(ii)State two changes which would each make the wave fronts become more curved after passing through the gap.(1 mark)

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SECTION B (55MARKS)
ANSWER ALL THE QUESTIONS IN THIS SECTION.

13.(a) State what is meant by refractive index of a material.(1 mark)

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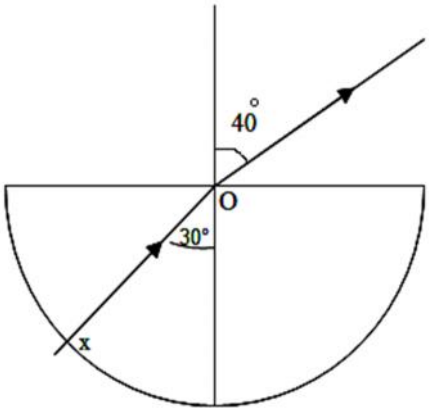
(b) Figure 9 represents a ray of light falling normally on the curved surface of a semi-circular plastic block at X, meeting the opposite face at an angle of incidence of 30^0 and emerging into the air at an angle of 40^0.

Fig 9



(i) State and explain what happens to the ray as it moves from:
I) Air to glass at X.(1marks)

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II) From glass to air at O.(1marks)

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(ii) Calculate refractive index of the plastic. (3marks)

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(iii) Describe how the apparatus above could be used to find the critical angle experimentally. (3marks)

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(iv)Calculate the critical angle for this plastic.
(2marks)

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14. (a) State what is meant by the term capacitance. (1marks)

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(b)David was asked to distinguish between a paper capacitor and an electrolyte capacitor.
In your opinion, what was his response? (1marks)

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(c) Figure 10 below shows a network of capacitors in series.

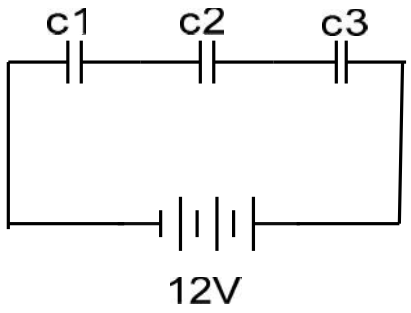

Fig 10.

(i) Derive an expression for their effective capacitance C_E from first principles. (4marks)

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(ii) Given that C_1=10.5μF, C_2 =2μF and C_3= 3μF.
Calculate C_E in (2) above and hence
Determine the charge stored on each capacitor. (3marks)

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(d) Capacitors have a wide range of applications
Briefly describe their use in rectification. (2marks).

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15.(a) Use the figure 11 below to answer the questions that follows.

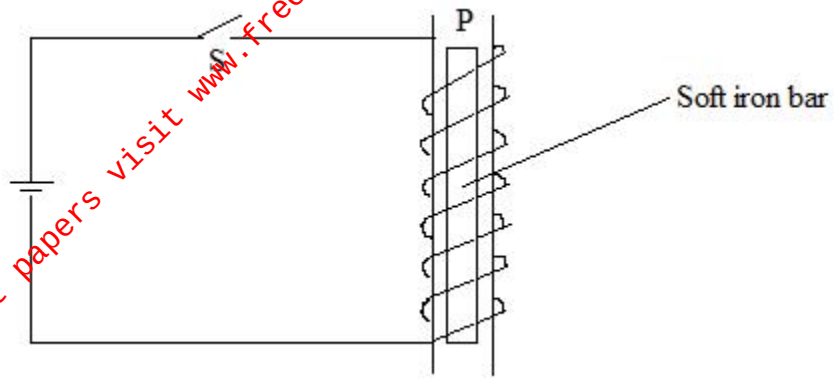

Fig.11

(i) Show the direction of the current on the turns when the switch S is closed. (1marks)

(ii) State the polarity at P (1marks)

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(iii) Explain using domain theory what happens on the soft iron bar. (1marks)

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(iv). If steel bar was used instead, what could be the difference? (2marks)

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(b) The following diagram (figure 12), shows a part of an electric d.c motor.

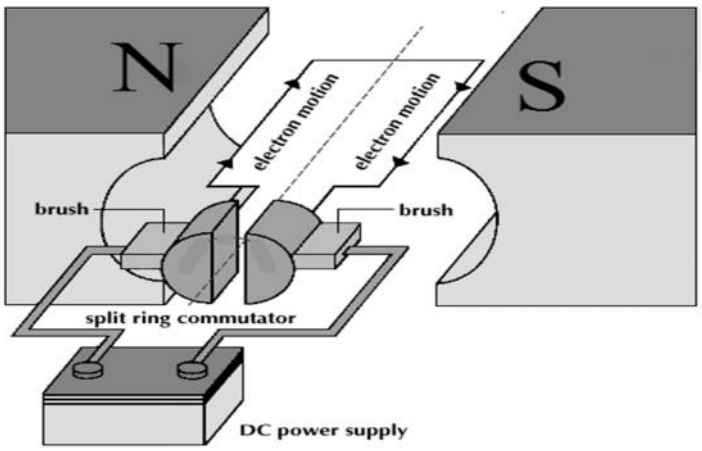

Fig 12.

(i) On the diagram above show the direction of rotation of the coil. (1marks)

(ii) State the effect of increasing the number of turns of the rotating coil of an electric motor (1marks)

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(c) Sketch the magnetic field pattern around the conductor carrying current on figures 13 and 14 shown below.

(1marks)

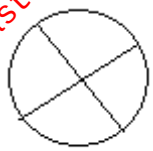

Fig 13.

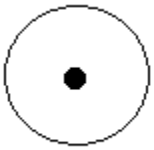

Fig.14 (1marks)

16. (a) Thorium decays to protactinium by emission of a beta particle (β) as shown.

$$Th \xrightarrow{\beta} {}^{234}_{91}Pa$$

Determine the atomic and mass number of thorium

Atomic number ……mass number ……(2marks)

(b) The figure 15 below shows the path taken by three radiations A,B and C from a radioactive source through an electric field.

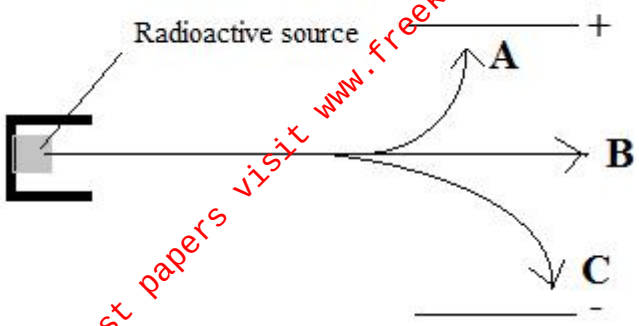

Fig.15

(i) Identify the radiation B (1marks)

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(ii) Give a reason for the difference in deviation shown by A and C (2marks)

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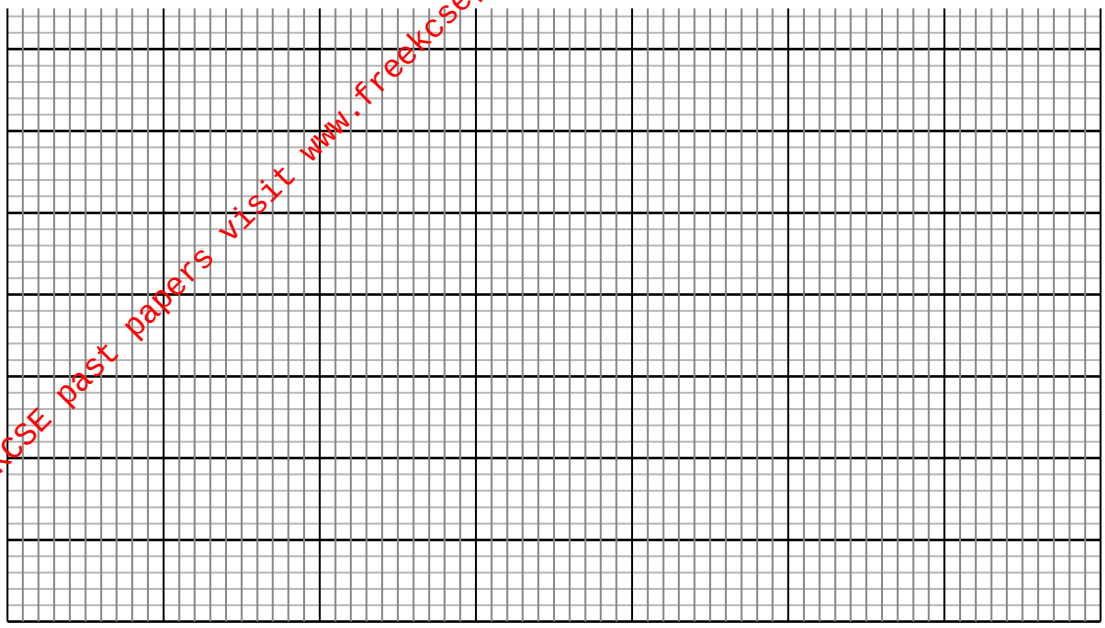
(c) The table 1.Below shows results obtained from a G-M tube when a radioactive sample was placed near it.

Time (min)	0	1	2	3	4	5	6
Counts per (min)	1048	994	926	838	719	557	330
Correct count							

Tab1.

(i) Given that the background radiation was 30 counts per minute, fill in the blank spaces in the table. (1mark)

(ii) Draw a suitable graph on the grid provided.



(ii) From the graph determine the half-life of the sample.(1mark)

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17.(a) (i) Draw a labeled diagram to show the essential features of a step - up transformer (1mark)

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(ii) State the law of electromagnetic induction on which the working of the transformer depends. (1marks)

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(ii) Use the law stated in (ii) above to explain how the transformer works. (2marks)

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(b) When a 240V electrical supply is connected to primary winding of a transformer, a current of 50mA flows in the circuit. The secondary winding is connected to a 5Ω resistor in which a current of 1.5A flows. Calculate;

(i) The power supplied to the transformer. (2marks)

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(ii) The power dissipated in the 5Ω resistor. (2marks)

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(iii) The efficiency of the transformer. (2marks)

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