

Name..... Adm no.....Class.....

Signature Date.....

232/2

PHYSICS PAPER 2

(THEORY)

MARCH/APRIL

2 Hours

FORM FOUR JOINT EVALUATION - 2017

Kenya Certificate of Secondary Education

PHYSICS

Paper 2

2 hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided at the top of this page.
2. This paper has two section **A** and section **B**.
3. Answer all the questions in the two sections.
4. Working of numerical questions must be clearly shown.
5. Marks may be given for correct working even if the answer is wrong
6. Mathematical tables or scientific calculators may be used.

FOR OFFICIAL USE ONLY

SECTION	QUESTION	MAX SCORE	STUDENT'S SCORE
A	1 – 13	25	
B	14	12	
	15	12	
	16	12	
	17	09	
	18	10	
GRAND TOTAL		80	

This paper consists of 9 printed Pages.

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (25 MARKS)

Answer all the questions in the spaces provided

1. **Figure 1** shows a ray of light XY striking the mirror CD held at an angle of 108° to mirror DE.

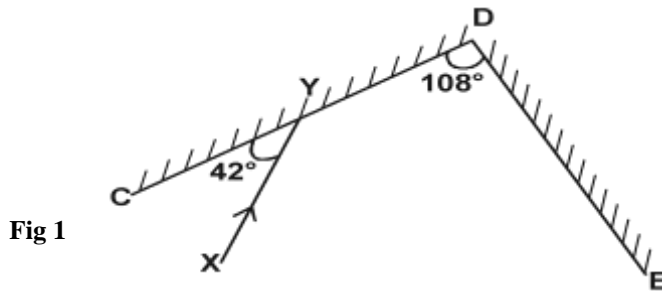


Fig 1

Complete the path of the ray XY and state the final angle of reflection. (2marks)

2. State one condition necessary for total internal reflection to take place. (1mark)

3. **Figure 2** shows a steel bar to be magnetized.

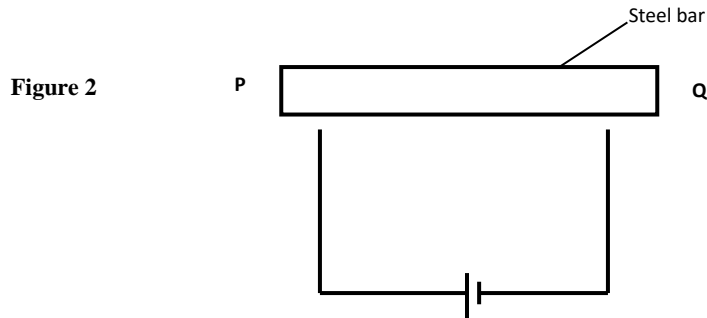


Figure 2

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

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

A	B	Visible light	UV light	C
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Identify the radiations marked A and C. (2marks)

A.

C

5. **Figure 3** below shows two parallel light rays incident on a concave mirror.

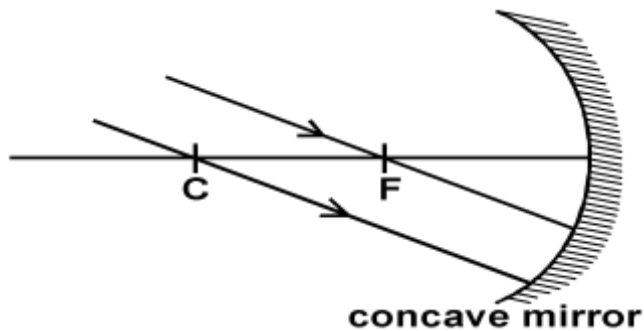
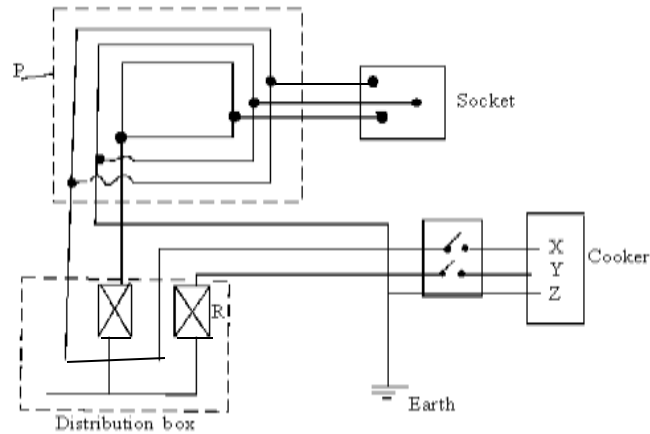


Fig 3

Sketch on the same diagram the path of the rays after striking the mirror and show the image. (2marks)

6. A transformer has 1000 turns in its secondary coil and 10 turns on its primary coil. An alternating current of 2.5A flows in the primary circuit when it is connected to a 12V a.c. supply. Calculate the e.m.f. across the secondary . (3marks)

7. The figure below shows a section of a house wiring system.



Name : (i) The circuit labeled **P** (1mark)

P.....

(ii) The terminals labelled **X** and **Y** (2marks)

X.....

Z.....

8. A girl guide standing some distance from a wall blows a whistle and hears its echo one second later. Determine how far the wall is from the girl guide. (Speed of sound in air is 333m/s) (3marks)

9. An electric heater of resistance 100 Ohms is rated 12.5A . Determine the amount of heat energy in joules it produces in one hour. Give your answer in standard form. (3marks)

10. Figure 4 below shows how the displacement varies with time for a certain wave.

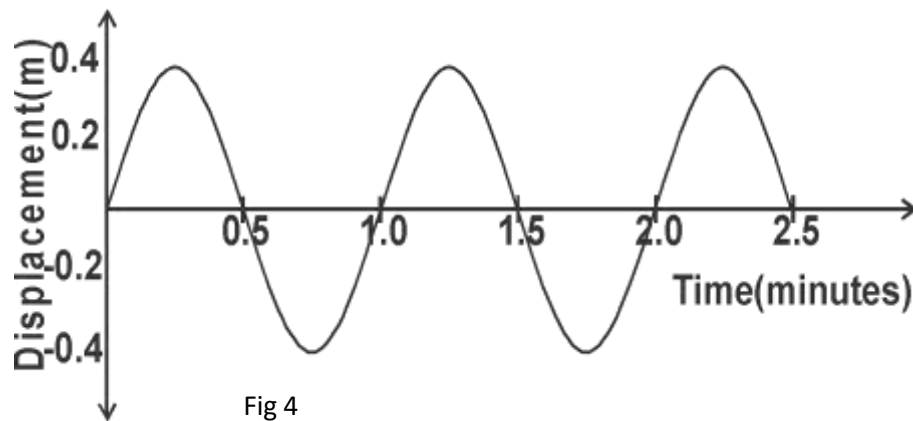
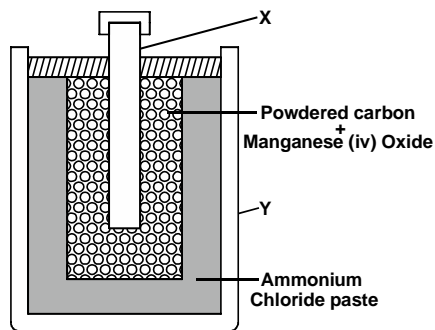


Fig 4

Determine the frequency of the wave.

(2 marks)

11. The figure below shows a dry cell.



Name the part labelled X.

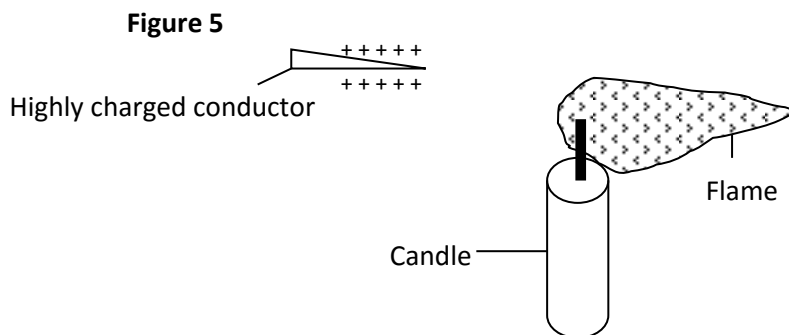
(1mark)

X.....

12. State how polarization in a simple cell is minimised .

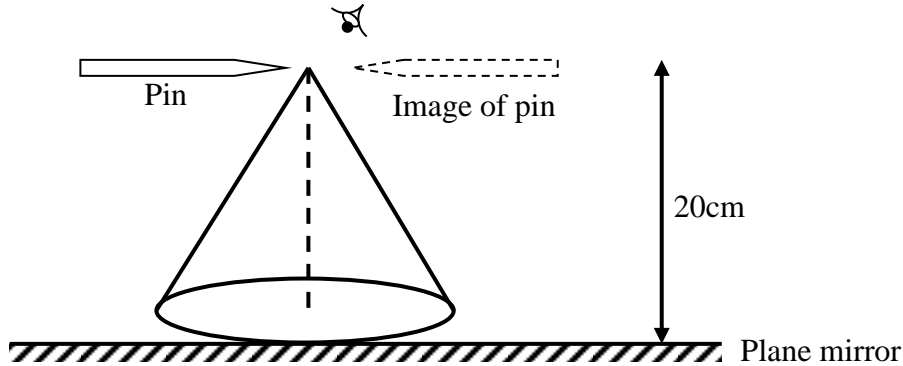
(1mark)

13. Give a reason why a candle flame is blown when a highly charged conductor is brought close to it as shown in Figure . 5 (1mark)



SECTION B (55 MARKS)**Answer ALL the questions in the spaces provided**

14. a) Some students determined the focal length of a convex lens of thickness 0.6cm using an optical pin and a plane mirror. Figure 6 shows the experimental set up when there is no parallax between the pin and the image.

**Fig. 6**

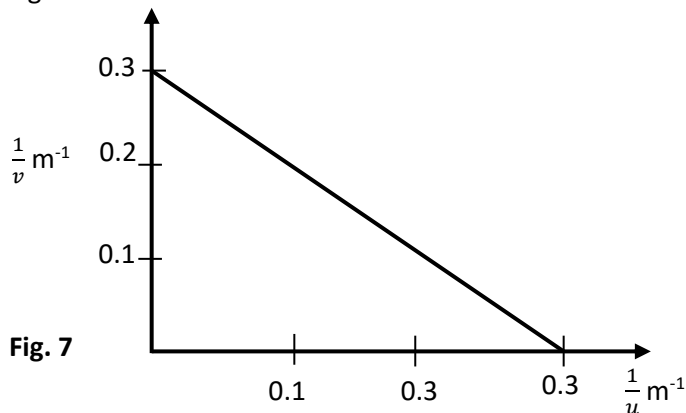
Determine the focal length of the lens .

(2marks)

- (b) An optician at Kenyatta Hospital examined an eye of a patient and made the following observations: Eye too short and the focal length of the eye lens short.

- (i) State the eye defect of the patient. (1 mark)
- (ii) Use a diagram to describe how the defect could be corrected. (2marks)

- (c) The graph below shows the variation of $1/v$ and $1/u$ in an experiment to determine the focal length of a lens.

**Fig. 7**

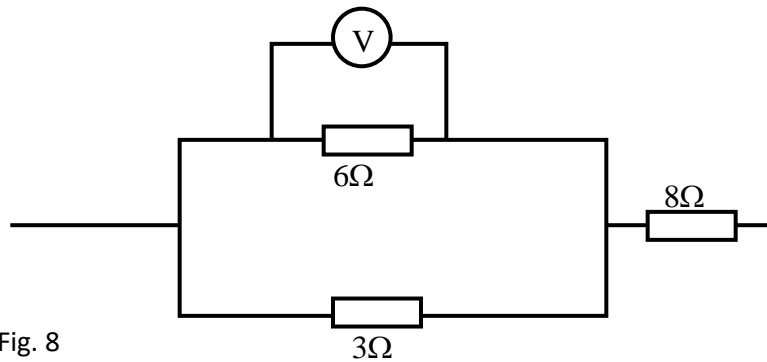
- (i) Use the graph to determine the focal length of the lens. (2marks)

(ii) Determine the power of the lens . (2marks)

(d) A converging lens forms an image which is three times the object. Determine the focal length of the lens if the distance between the object and the screen is 80cm. (3 marks)

15. (a) Define the term electric resistance. (1mark)

(b) Figure 8 shows three resistors as shown.



If the voltmeter reads 4V, find the
(i) Effective resistance . (2 marks)

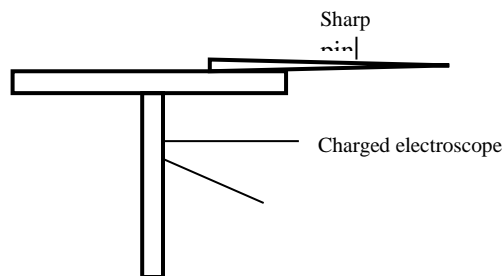
(ii) Current through the 3Ω resistor (3marks)

(iii) Potential difference across the 8Ω resistor. (3 marks)

(c) A cell supplies a current of 0.5A when connected to a 2Ω resistor and 0.25A when connected to a 5Ω resistor. Find the internal resistance of the cell. (3 marks)

16. a) In **figure 9** below, a sharp pin is fixed on a cap of a leaf of electroscopes. The electroscopes are highly charged and then left for some time.

Fig. 9



State and explain the observation made after sometime.

(2marks)

- b) Four capacitors were connected in a circuit as shown in **figure 10**. The switch is then closed.

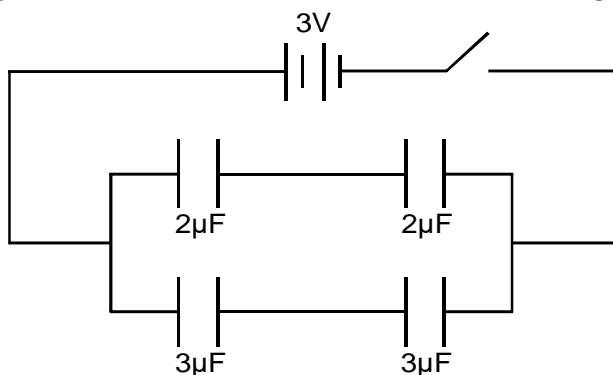


Fig 10

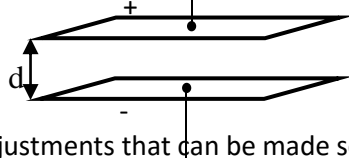
Determine : (i) The effective capacitance . (3marks)

(ii) The total charge. (3marks)

(iii) The energy stored in the combination when the switch is closed. (3marks)

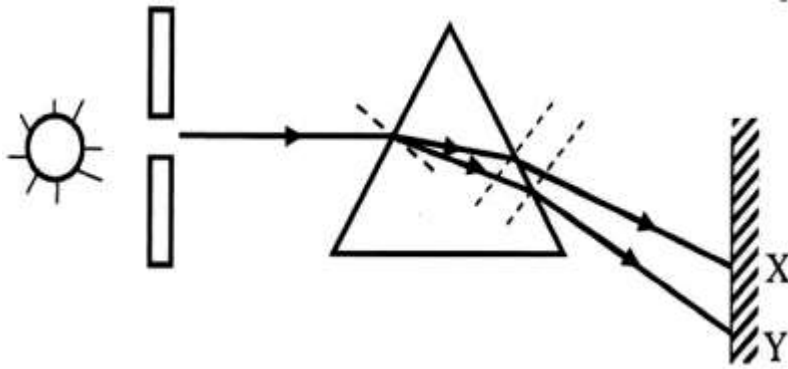
- c) **Figure 11** below shows a pair of parallel plates of capacitors connected to a battery. The upper plate is displaced slightly to the left.

Fig. 11



Suggest one other adjustments that can be made so as to reduce the effective capacitance. (1mark)

17. (a) The diagram below shows a narrow beam of white light onto a glass prism.



- (i) State the name of the phenomenon represented in the diagram. (1mark)

- (ii) Name the colour at X and Y. (2marks)

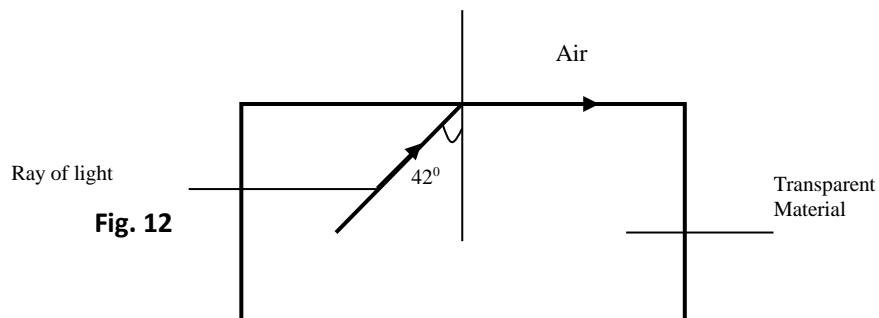
X.....

Y.....

- (iii) Give a reason for your answer in part (ii) above. (2marks)

- (iv) State the purpose of the slit. (1mark)

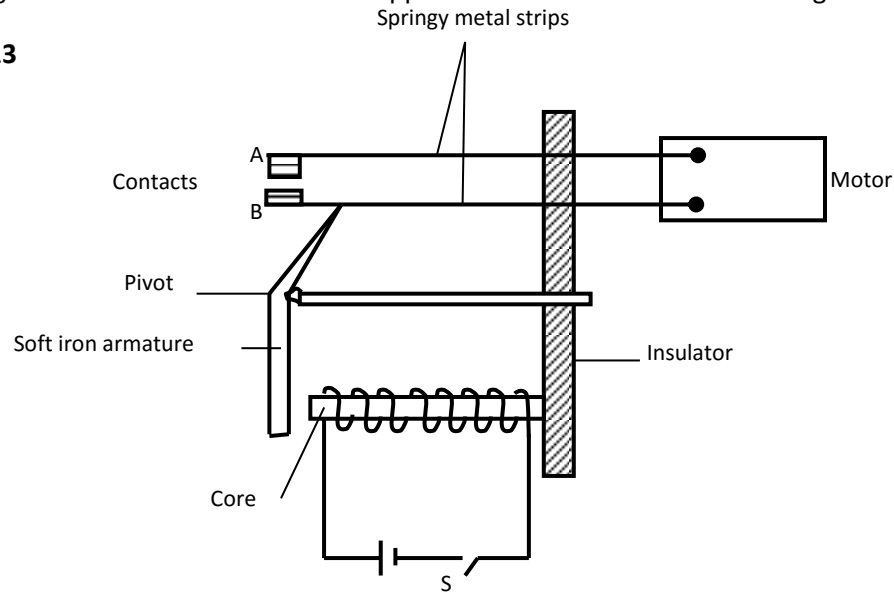
- b) Figure 12 below shows the path of a ray of light through a transparent material placed in air.



- Determine the refractive index of the transparent material. (3marks)

18. **Figure 13** 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 13



- (a) Suggest a suitable material for the core. (1mark)
- (b) State what happens to the core when switch S is closed? (2marks)
- (c) Explain why 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)

