

Name.....Index Number...../..... Cl..... Adm

232/2

PHYSICS

Paper 2

(Theory)

March/April 2016

2 hours

Candidate's Signature.....

Date.....

MOKASA JOINT EXAMINATIONS
Kenya Certificate of Secondary Education (KCSE)
PHYSICS
Paper 2
(Theory)
2 hours

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.
- This paper consists of 13 printed pages.
- Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

For Examiner's Use Only

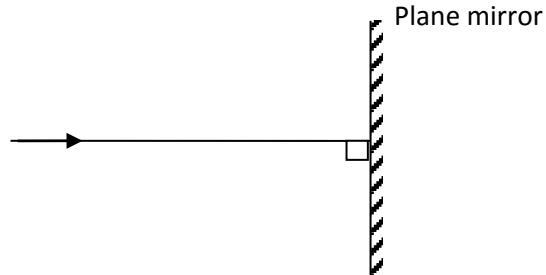
Section	Question	Maximum Score	Candidate's Score
A	1 - 12	25	
B	13	9	
	14	8	
	15	11	
	16	10	
	17	8	
	18	9	
	Total Score	80	

Section A (25 marks)

Answer **ALL** the questions in the spaces provided.

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

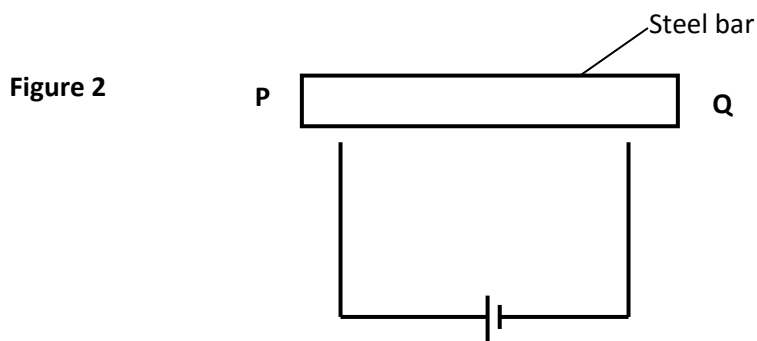
Figure1



- (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)

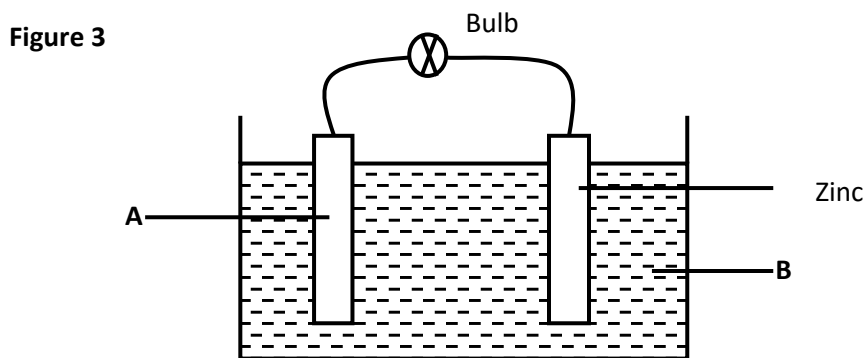
5. State and explain the functions of the keeper when storing magnets. (2marks)

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)

A:

B:

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

A:

C:

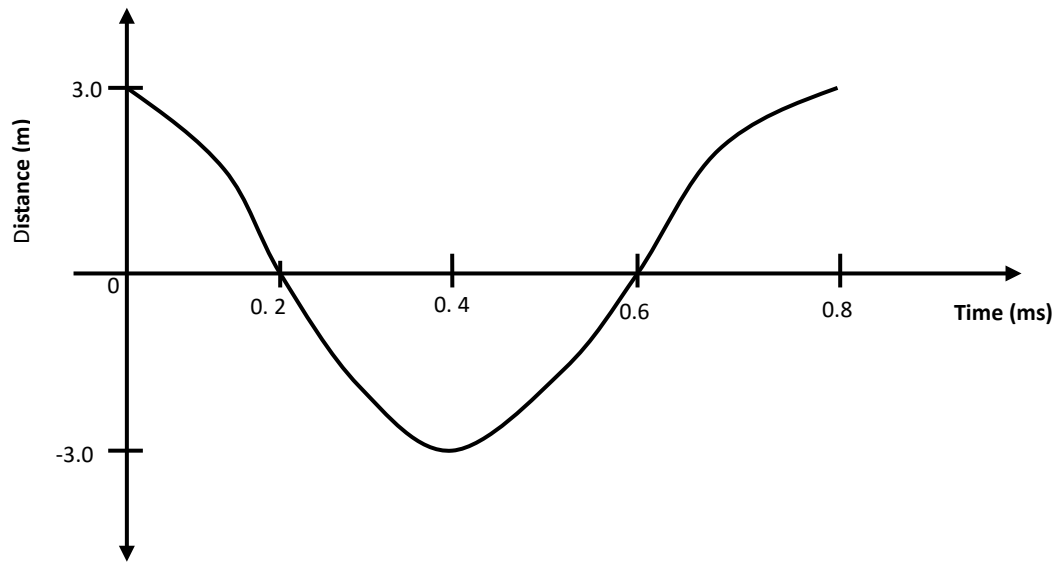
(b) Give **one** application of the radiation marked **B**. (1mark)

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

Figure 4



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

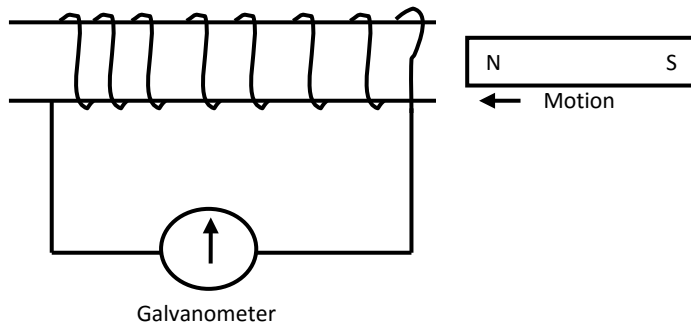
12. An electric kettle is rated at 1.8 kW, 240 V. Explain the choice of the safest fuse for the kettle. (the available fuses are 5 A, 10 A, and 20 A) (3marks)

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:

- (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)

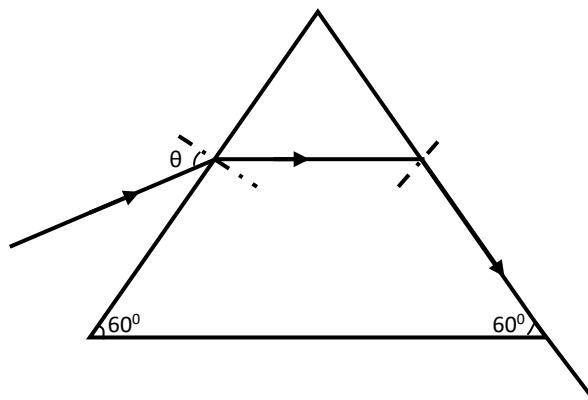
14. (a) A coin is placed at the bottom of a tall jar. The jar is filled with paraffin to a depth of 32.4 cm and the coin is apparently seen displaced 9.9 cm from the bottom. Determine the refractive index of air with respect to paraffin. (3marks)

(b) Define the term **critical angle**.

(1mark)

- (c) **Figure 6** shows a ray of light passing through a glass prism.

Figure 6



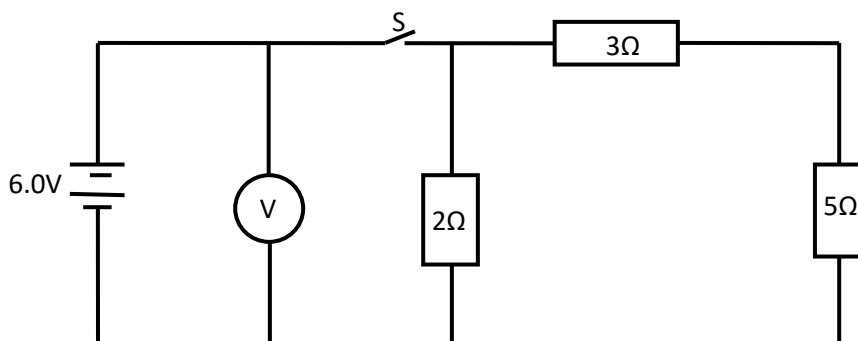
If the speed of light in prism is $2.0 \times 10^8 \text{m/s}$

- (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)

15. (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



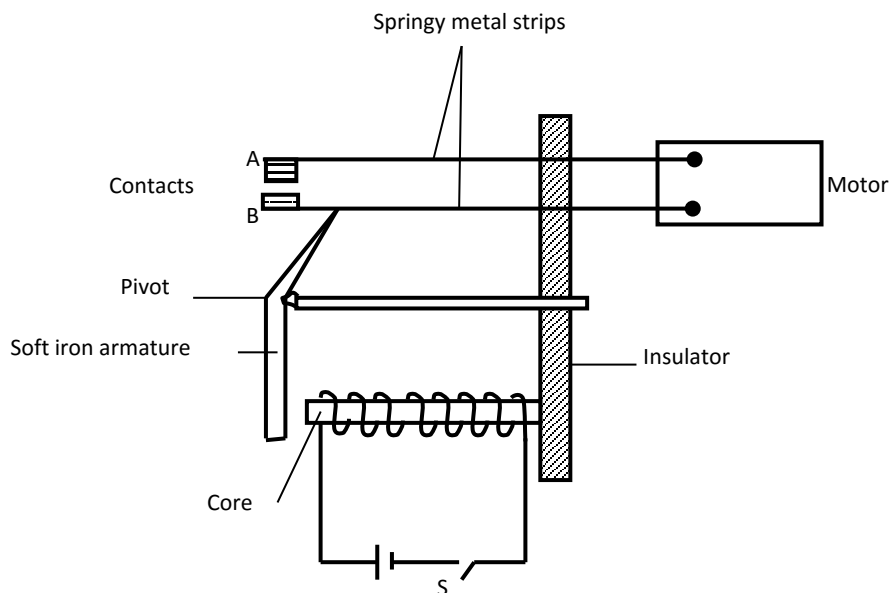
- (i) If each cell has an internal resistance of 0.7Ω , determine the total resistance in the circuit. (3marks)
- (ii) What amount of current flows through the 3Ω resistor when the switch is closed? (3marks)
- (iii) What is the reading of the voltmeter when the switch S is
(I) Open (1mark)

(II) Closed (1mark)

(iv) Account for the difference between the answers in (I) and (II) above. (1mark)

16. **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)

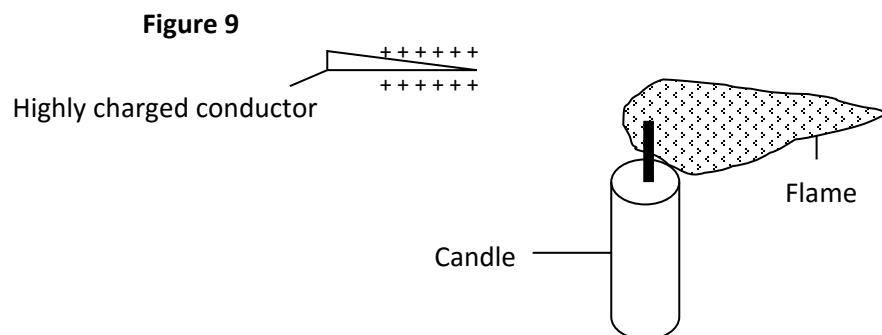
(d) When the switch S is opened, what will happen to;
(i) The core (1mark)

(ii) Soft iron armature. (1mark)

(e) Give **one** other application of an electromagnet. (1mark)

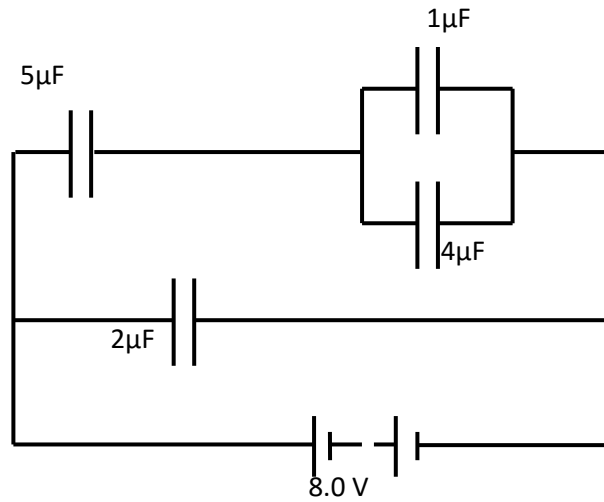
(f) State **two** ways in which an electromagnet could be made more powerful. (2marks)

17. (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) **Figure10** shows $1\mu\text{F}$, $2\mu\text{F}$, $4\mu\text{F}$ and $5\mu\text{F}$ capacitors connected to a battery.

Figure 10



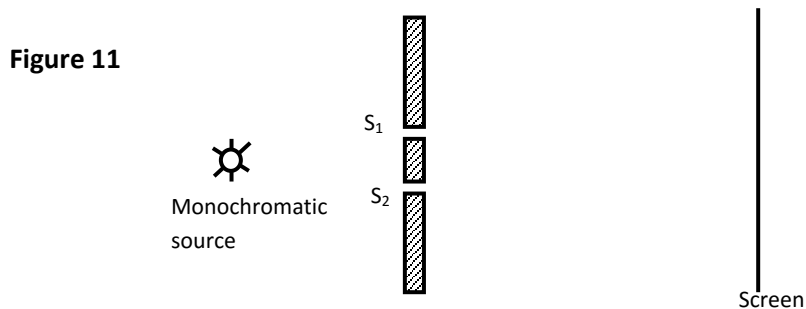
Determine:

(i) The total capacitance. (2marks)

(ii) The total charge. (2marks)

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

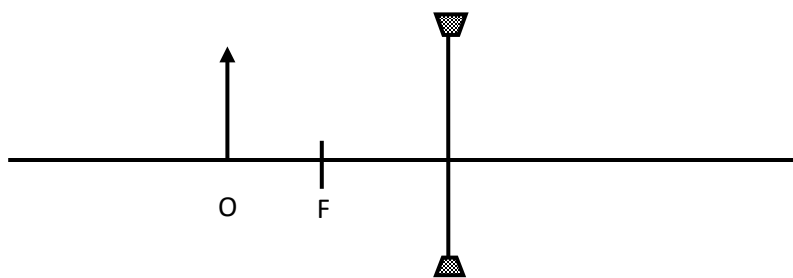
18. (a) In an experiment to observe interference of light a double slit experiment was placed close to the monochromatic source as shown in **Figure 11**.



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

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

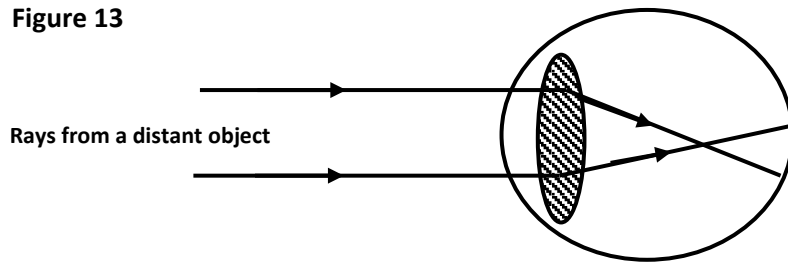
(b) **Figure 12** shows an object O placed in front of a diverging lens whose principal focus is F.



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)