

NAME: INDEX NO.

SCHOOL: DATE

CANDIDATE'S SIGN.

232/2

PHYSICS

PAPER 2 (THEORY)

JULY /AUGUST 2014

TIME: 2 HOURS

KISUMU WEST DISTRICT JOINT EVALUATION EXAM

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

PHYSICS

PAPER 2 (THEORY)

INSTRUCTIONS TO CANDIDATES:

- Write your **name**, **school** 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.
- Scientific calculators and KNEC Mathematical tables may be used.

For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-14	25	
B	15	9	
	16	12	
	17	13	
	18	10	
	19	11	
	TOTAL	80	

This paper consists of 12 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are Missing

SECTION A - 25 MARKS

Answer all questions in this section

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

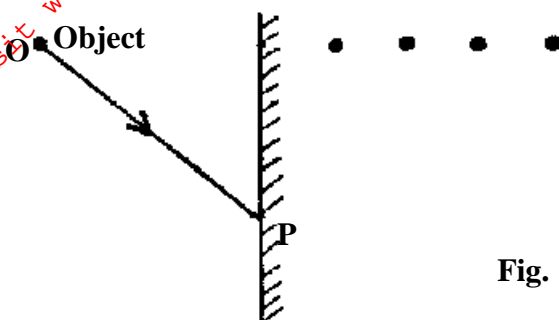


Fig. 1

- (i) Which of the four dots represent correct position of the image of **O**? Label this dot **Q** (1mk)
 - (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**. (1mk)
2. A charged conductor is slowly brought near the cap of a positively charged electroscope. The leaf first collapses and then diverges. State the charge on the conductor (1mk)
3. Give a reason why it is necessary to leave the caps of the cells open when charging an accumulator (1mk)
4. Figure 2 below shows a simple experiment using a permanent magnet and two metal bars **A** and **B** Put close to the iron filings.

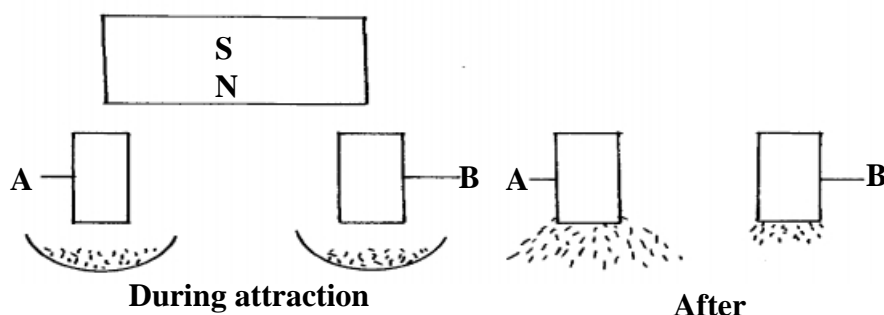


Fig. 2

- State with a reason which bar is made from a soft magnetic material. (2mks)
5. Figure 3 below shows two parallel current carrying conductors **P** and **Q** placed close to one another. Current flows in the opposite directions.



Fig. 3

Sketch on the figure the magnetic field pattern formed by the two conductors. (1mk)

6. Figure 4 below shows two identical lamps L_1 and L_2 connected to a battery.

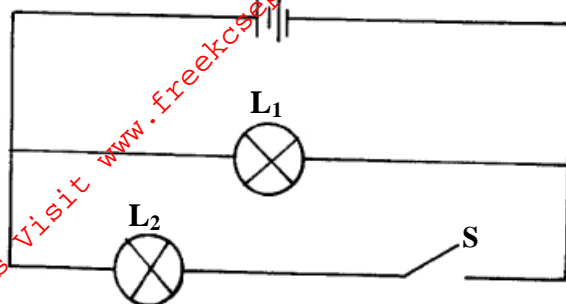


Fig.4

- (a) Using an arrow, indicate on the diagram above the direction of the conventional current (1mk)
 (b) State the effect if any, of closing switch S on L_1 (1mk)

7. Figure 5 below shows a ray of light incident on water-kerosene interphase.

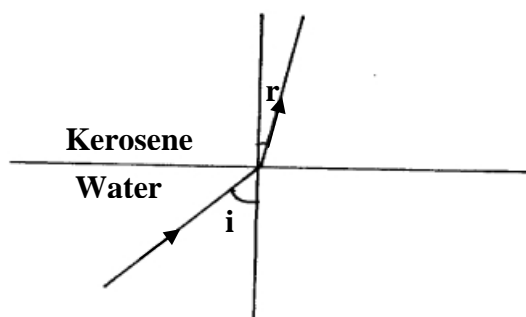


Fig.5

State which one of the two liquids has a higher absolute refractive index. (1mk)

8. The table in **figure 6** below shows part of the electromagnetic spectrum in order of decreasing wavelength

A	B	INFRA RED RADIATION	VISIBLE LIGHT	C	D
---	---	---------------------	---------------	---	---

Figure 6

- (a) How are waves **C** produced? (1mk)
 (b) State one use of the wave **D** (1mk)

9. Figure 7 below shows two solenoids, **X** and **Y** close to each other.

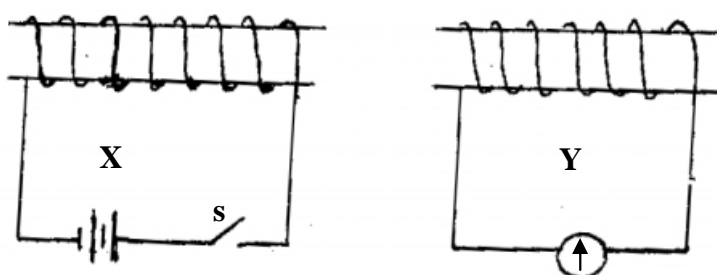


Fig.7

- (a) Name the process by which current is caused in **Y** by closing the switch **S**. (1mk)
 (b) Show on the diagram above the direction of current in **Y** as switch **S** closes. Use an arrow.

(1mk)

10. A house has a lighting circuit operated from a **240V** mains supply. Four bulbs rated **40W 240V** and six bulbs rated **100W 240V** are switched on for **5** hours a day. Determine the monthly bill for the consumer given that the cost of electricity is at shs. 5.50 per unit.
(Take 1 month = 30 days and the standing charge is sh. 150) (3mks)
- 11., State **two** properties of **X-rays** similar to those of visible light. (2mks)
12. Explain why the tube of a cathode ray oscilloscope is made of thick glass walls. (2mks)
13. (a) Define the term work function (1mk)
(c) Explain how the intensity of radiation affects the photo-electric effect (1mk)
14. Figure 8 below shows an eye defect

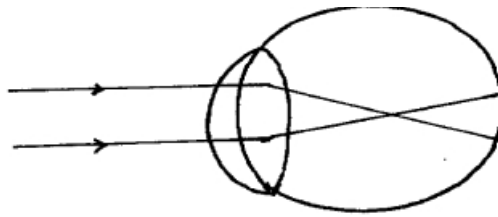


Fig 8

Use a ray diagram to show how the defect above could be corrected.

(2mks)

SECTION B - (55 MARKS)

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

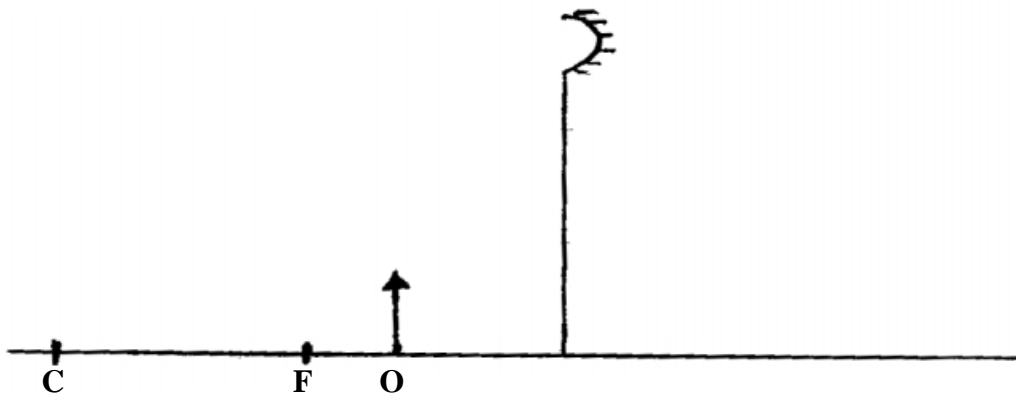
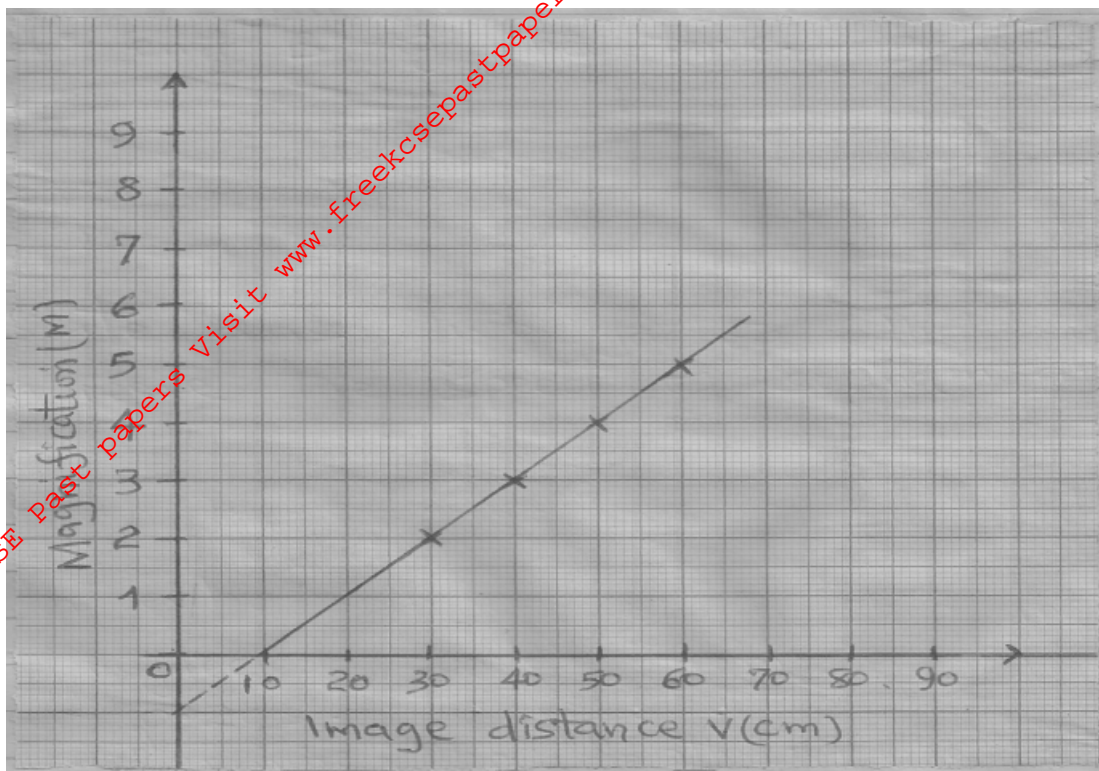


Fig. 9

- (i) By drawing suitable rays, show the position of the image (2mks)
- (ii) Determine the magnification of the image formed (2mks)
- (b) In an experiment to determine the focal length of a concave mirror, a group of form two students collected some data and used the results to plot the graph shown in figure 10 below.



Using the graph above, determine:

- The object position when the image position is 45 cm (2mks)
- Slope of the graph. (2mks)
- The focal length of the mirror given (1mk)

$$m = \frac{v}{f} - 1$$

16. (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.

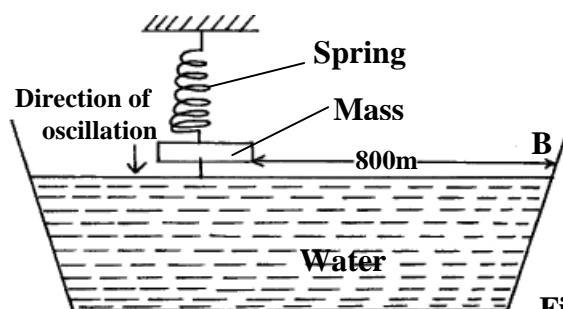


Fig. 11

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

- The periodic time of the mass (2mks)
 - The frequency of the waves produced on the water surface (1mk)
 - 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)

17. (a) (i) Define capacitance of a capacitor (1mk)

.....

.....

- (ii) **Figure 12** below shows a pair of parallel plates of a capacitor connected to a battery. The upper plate is displaced slightly to the left.

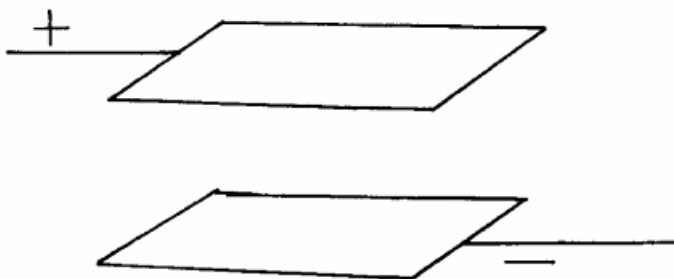


Fig 12.

- State with a reason the effect of this movement on the capacitance (2mks)

.....

.....

- iii) The circuit diagram in figure13 below shows four capacitors connected between two points **A** and **B**

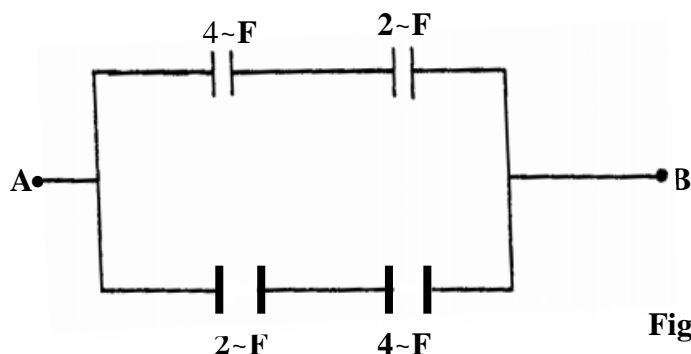


Fig 13

Determine the capacitance across **AB**.

(3mks)

(d) **Figure 14** below shows metal plates **X** and **Y**. Metal **Y** is illustrated by ultra-violet radiation.

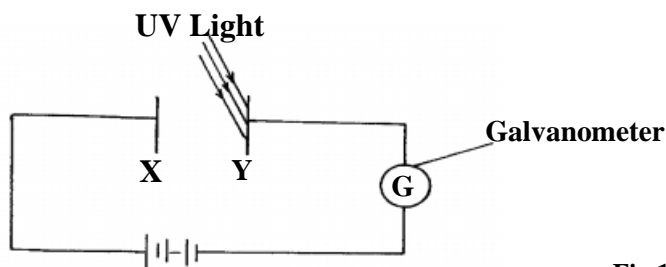


Fig.14

(i) State the observation made on the galvanometer

(1mk)

.....

(ii) Explain the observation in (i) above

(2mks)

.....

(iii) A material has a work function of 2.0eV. Determine the largest wavelength of incident radiation that can cause photo electrons to be emitted from its surface.

$$C = 3 \times 10^8 \text{ m/s}, h = 6.63 \times 10^{-34} \text{ Js}$$

(4mks)

$$1\text{eV} = 1.6 \times 10^{-19} \text{ J}$$

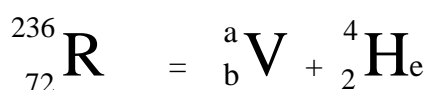
18. (a) Define Radioactivity

(1mk)

.....

(b) An element **R** decays by giving off an alpha particle. Complete the equation below showing the values of **a** and **b**

(1mk)



a = _____ b = _____

- (c) Figure 15 below shows the features of a diffusion cloud chamber used for detecting radiations from radioactive sources.

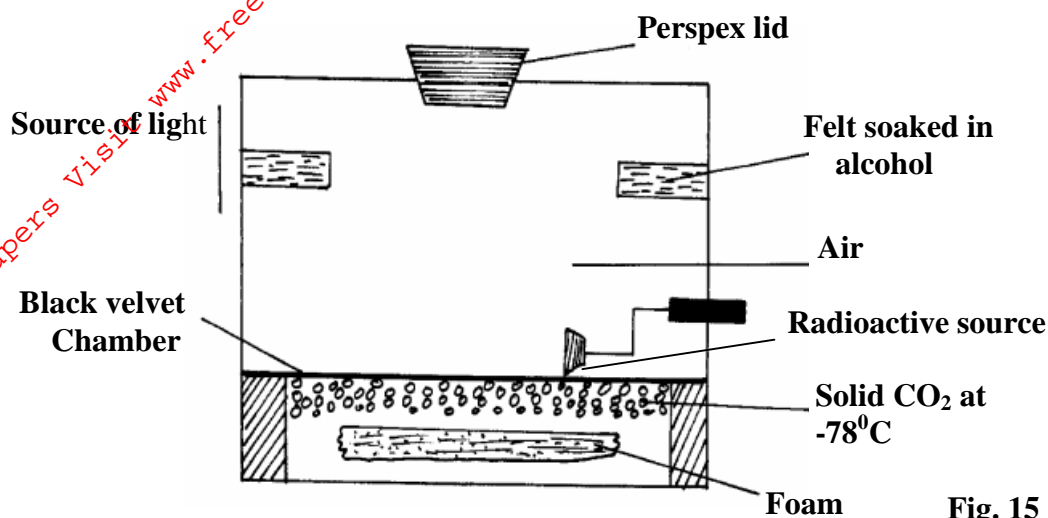


Fig. 15

- (i) State the property of alcohol that makes it suitable for use in the chamber (1mk)

.....

.....

- (ii) State the function of the Perspex lid. (1mk)

.....

.....

- (iii) Explain why the base velvet chamber is painted black (1mk)

.....

.....

- (iv) Explain how the radiation from the radioactive source is detected in the chamber. (4mks)

.....

.....

.....

.....

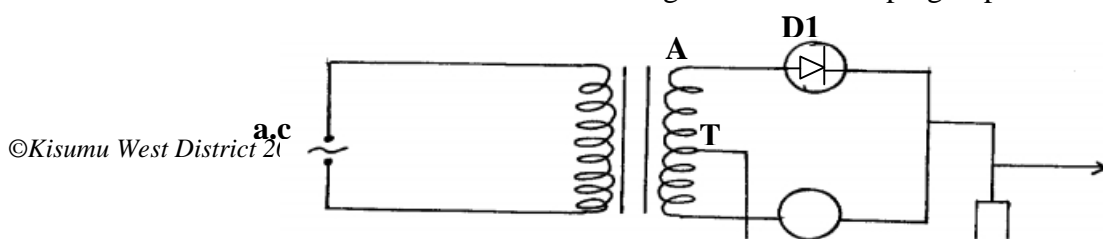
.....

- (v) State **one** advantage of the cloud chamber over a charged leaf electroscope when used as detectors of radiations (1mk)

.....

.....

19. A student connected a circuit as shown in figure 16 below hoping to produce a rectified out put



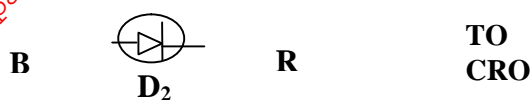


Fig 16.

- (a) Sketch the graph of the out put on the **CRO** screen (1mk)

- (b) Explain how the output above is produced (2mks)

.....
.....

- (c) Name other **two** uses of a junction diode (2mks)

.....
.....
.....

- (e) Graph in figure 17 below shows a forward bias characteristic of a **P - N** junction

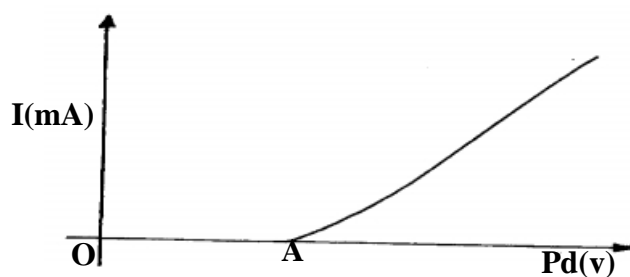


Fig.17

The depletion layer decreases from **O** to **A**. Explain what is meant by depletion layer. (2mk)

.....
.....

- (f) (i) Define the term doping (1mk)

.....
.....

- (ii) Explain how doping produces a P-type semi-conductor. (3mks)

.....

For More Free KCSE Past papers Visit www.freekcsepastpapers.com

.....

.....

.....