Name: ……………………………………………………….. **Adm No**: …………………

School: ……………………………………………………. **Class**: …………………….

232/2
PHYSICS
PAPER 2
JUNE-2022
TIME: 2 HOURS

SUKELLEMO -2022
Kenya Certificate of Secondary Education (K.C.S.E.)

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** questions in section **A** and **B** in the spaces provided.
•   All working **must** be clearly shown in the spaces provided.
•   Mathematical tables and electronic calculators may be used.

For Examiners' Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1 – 12	25	
B	13	10	
	14	08	
	15	13	
	16	12	
	17	12	
TOTAL		80	

This paper consists of 10 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions is missing

SECTION A (25 MARKS)

1. The diagram below shows the image formed by a convex mirror. Complete the diagram to show the position of the object. (2mks)
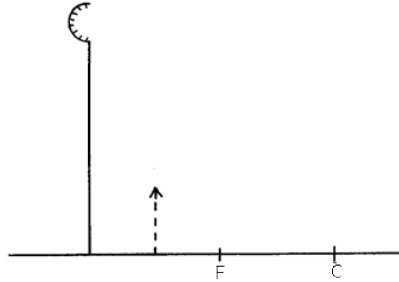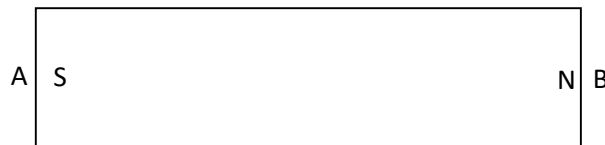

2. Explain why sound cannot be heard from far when one shouts in a forest. (1mk)

3. The chart below shows an arrangement of different parts of the electromagnetic spectrum.

Radio	A	Visible	Ultra-violet	X-Rays	Gamma rays

Name the radiation represented by **A**. (1mk)

4. The figure below shows a magnet. Point **A** and **B** are in front of the magnet.

On the axes provided, sketch a graph showing how the magnetic field strength changes from A to B. (2mks)

5. (a) Machines at a textile industry experiences electrostatic forces at certain points. Suggest a method that can be used to reduce these forces. (1mk)

(b) A sharp point of a pin is held over a positively charged electroscope. State and explain the observation made on the electroscope.

(2mks)

6. The figure below shows two conducting wires A and B passing through a horizontal piece of cardboard.
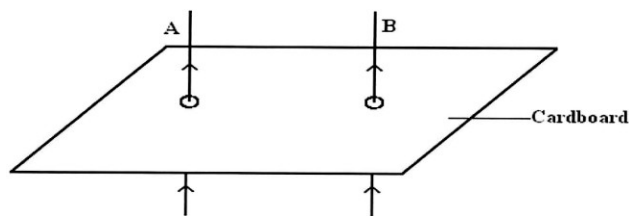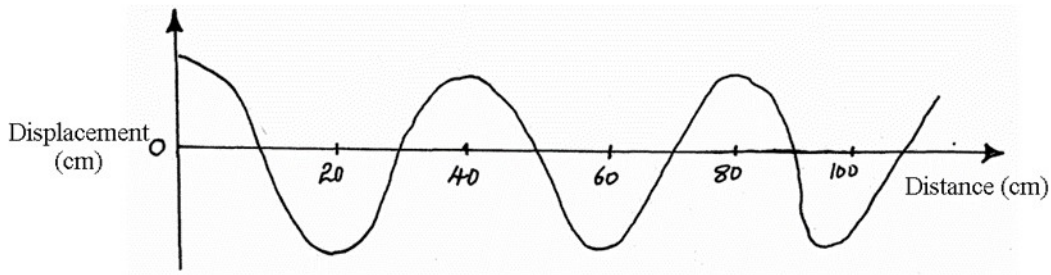

(i) Sketch the resultant magnetic field patterns when the currents of high magnitude are flowing on both wires as shown. (1mk)

(ii) **What** is the resulting effect of the field on the wires at the loose ends? (1mk)

(iii) If the current in B were to be reversed, **state how** resulting would affect the wire conductors. (1mk)

7. The figure shows a wave traveling along a medium.

Determine the speed of the wave if the source produces 480 vibrations per minute. (3mks)

8. State two things that determines the carrying capacity of an accumulator. (2mks)

9. Explain why when the pinhole of a pinhole camera is enlarged, a brighter but very blurred image is seen on the screen (2mks)

10. Calculate the operating current of a heating element rated 3kW, 240 Volts. (3mks)

11. State two factors affecting resistance of a resistor. (2mks)

12. Distinguish between an amplitude and wavelength of a wave. (1mk)

SECTION B

13. (a)A lens forms an image four times the size of the object on the screen. The distance between the object and the screen is 60cm when the image is sharply focused.
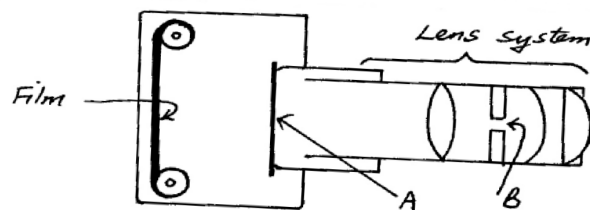   (i) State with a reason what type of lens was used. (2mks)

   (ii) Determine:
   (I) The object distance. (2mks)
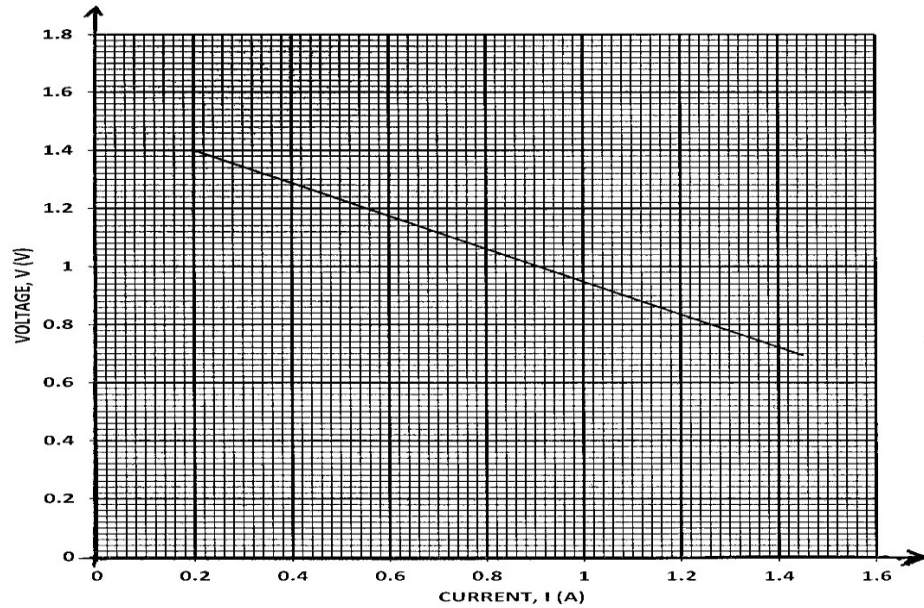
   (II) The image distance. (2mks)

b) The figure below shows the basic parts of a simple lens camera.

   (i) Name the parts labeled **A** and **B**. (2mks)

   (ii) State the function of each of the parts **A** and **B**. (2mks)

14. The graph below shows the variation of p.d (V) across the terminals of a cell and the current drawn from the cell.

a) Use the graph to determine:
   (i) The electromotive force (e.m.f) E of the cell.   (1mk)

   (ii) The internal resistance r, of the cell given that E = V + Ir.   (3mks)

(b) Draw a circuit diagram that may be used to obtain the values plotted in the graph. (2mks)

(c) Describe briefly how the circuit you have drawn may be used to carry out the experiment to obtain the values in the graph.   (2mks)

15.   (a) State Snell's law.   (1mk)

(b) A coin is placed beneath a transparent block of thickness 10cm and refractive index 1.56. Calculate the vertical displacement of the coin.   (3mks)

(c) The speed of green light in a prism is 1.94×10^8 m/s.
      (i) Determine the refractive index of the prism material.
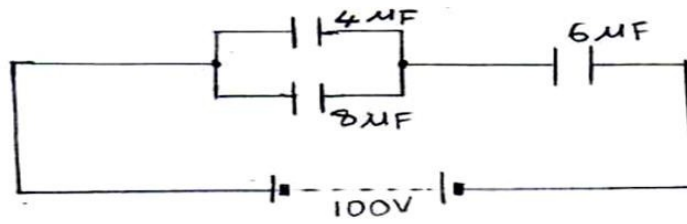   (Speed of light in air = 3.0×10^8 m/s).   (2mks)

(ii) Determine the critical angle of the prism material.   (2mks)

(d) State **two** advantages of using optical fibre in communication.   (2mks)

(e) The refractive indices of water and glass are $^3/_2$ and $^4/_3$ respectively. Find the value θ in the figure below.

(3mks)
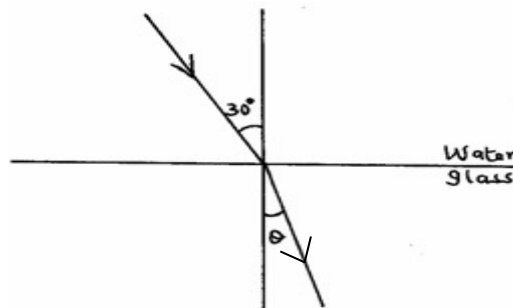
16. The figure shows a system of capacitors connected to 100V supply.

a) Determine:
   i)   The effective capacitance of the circuit.   (3mks)

   ii)   The charge through the 6µF capacitor.   (3mks)

   iii)   The p.d. across the 8µF capacitor.   (4mks)

b) State **two** factors that affect the capacitance of a parallel plate capacitor.   (2mks)

17. Some plane water waves were produced in a ripple tank. They pass from a region of deep water into a region of shallow water. The figure shows what the waves look like from above.

Boundary

Waves move this way

Deep water   Shallow water
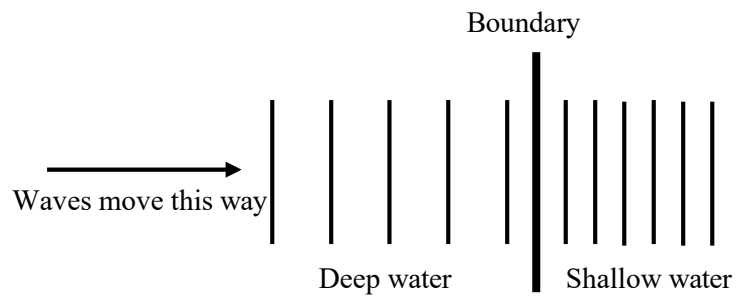
(a) State what happens at the boundary to:
   (i) The frequency of the waves.   (1mk)

   (ii) The speed of the waves   (1mk)

   (iii) The wavelength of the waves   (1mk)

(b) The waves have a speed of 0.12 m/s in the deep water. Wave crests are 0.08m apart in the deep water. Calculate the frequency of the source producing the waves.   (2mks)

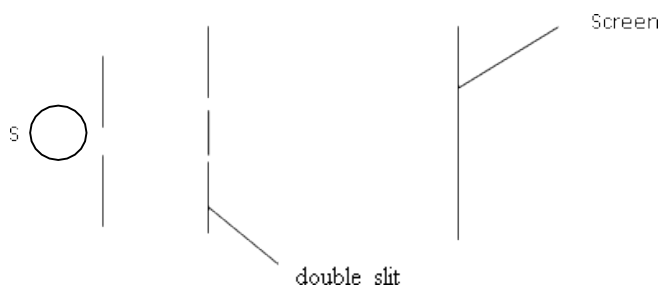(c)   State one difference between a stationary wave and a progressive wave.   (1mk)

(d) The figure below represents crests of straight waves produced in a ripple tank.
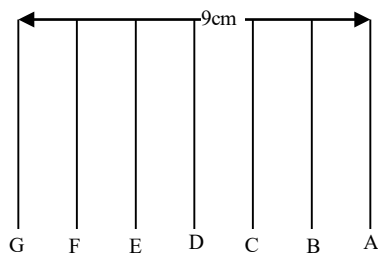
Determine the wavelength of the waves. (2mks)

(e) In an experiment to observe interference of light waves, a double slit is placed close to the source S of light as shown in the figure below.

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

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

(iii)State what is observed on the screen when the slit separation is reduced. (1mk)