

NAME..... ADM NO.....
SCHOOL..... CANDIDATES SIGN.....
DATE

232/2
PHYSICS
PAPER 2
FORM THREE
TIME: 2 ½ HOURS

END OF TERM (III) EXAMINATION -2019
Kenya Certificate of Secondary Education (K.C.S.E)

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PHYSICS
PAPER 2
FORM THREE
TIME: 2 ½ HOURS

INSTRUCTIONS TO THE CANDIDATES

- Write your name, Admission number, class and date of examination.
- The paper consist of section A and B
- Answer all the questions in section A and B in the spaces provided.
- All working must be clearly shown on the spaces provided.
- Mathematical tables and electronic calculators may be used.
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FOR EXAMINERS USE ONLY

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE SCORE
A	1-13	25	
B	14	8	
	15	8	
	16	9	
	17	10	
	18	10	
	19	10	
TOTAL		80	

SECTION A

1. Figure 1 below shows a ray of light AB striking the mirror XY held at an angle of 70° to the second mirror YZ



fig 1

Complete the path of the ray AB and state the final angle of reflection. (2mks)

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.....

2. Figure 2 below shows how displacement varies with time as a wave passes through a fixed point.

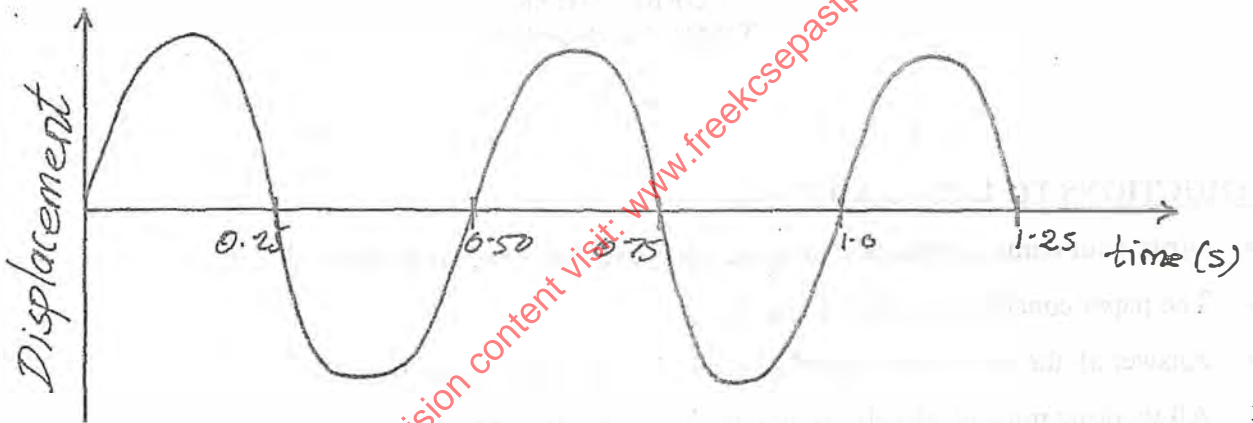


fig 2

Determine the frequency of the wave (2mks)

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3. Figure 3 below shows an incomplete circuit that could be used to investigate the variation of potential difference across a cell with the current drawn from the cell.

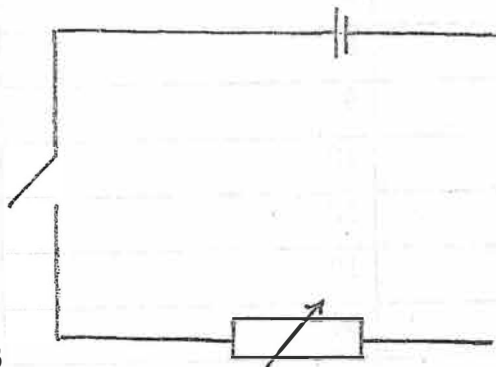


Fig 3

Complete the diagram (1mk)

4. The principal focus of a convex mirror is virtual. Explain (1mk)

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5. Explain how a positively charged electroscope gets discharged when the cap is touched with a finger (2mks)

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6. State Snell's Law (1mk)

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.....

7. a) State the reason why the caps of the cells of a lead and battery are opened when charging the battery (1mk)

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b) A current of 0.8A flows in a circuit. Determine the quantity of charge that crosses a point in 5 minutes (2mks)

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.....

8. A heater of resistance R_1 is rated P watts, V volts while another of resistance R_2 is rated $2P$ watts, $\frac{V}{2}$ volts. Determine $\frac{R_1}{R_2}$ (3mks)

.....
.....
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9. During a storm, a person sees a flash of lightning and hears the thunder after 4.5 seconds. Determine the distance of the thunder cloud from where the person is (speed of sound in air = 300m/s)

(2mks)

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.....

10. Figure 4 below shows two light iron bars attracted to the edge of a bar magnet.

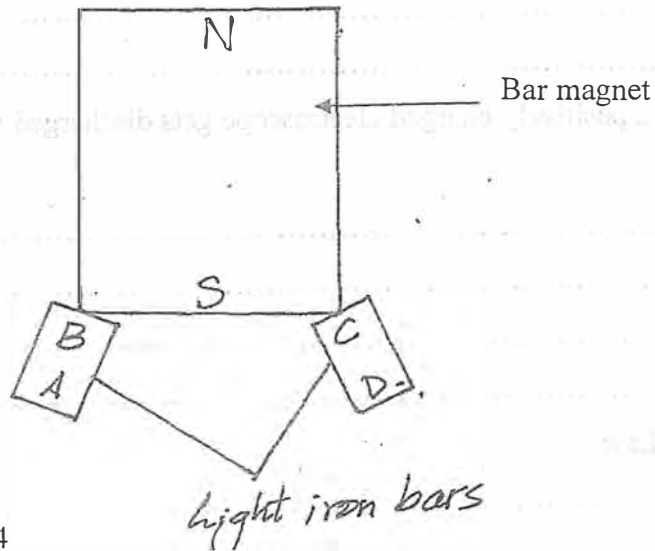


fig 4

a) State the polarity of the ends labeled A and D (1mk)

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.....

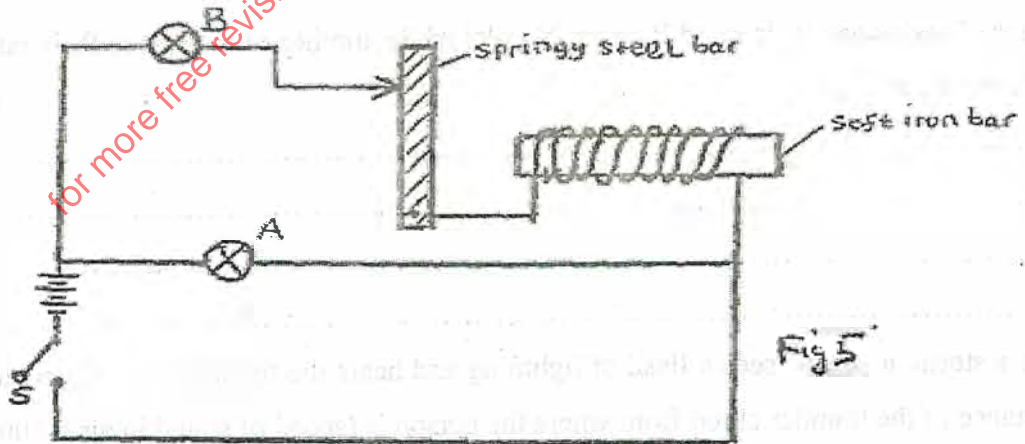
b) Another bar magnet is brought in between the two light iron bars, such that its South pole is near ends A and D. State giving a reason, the observation made on the light iron bars (2mks)

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11. Figure 5 below shows a circuit with two bulbs A and B



When the switch is closed, bulb A lights continuously while bulbs B flickers. Explain (2mks)

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12. Figure 6 below shows a progressive wave incident from a shallow end to a deep end of a ripple tank

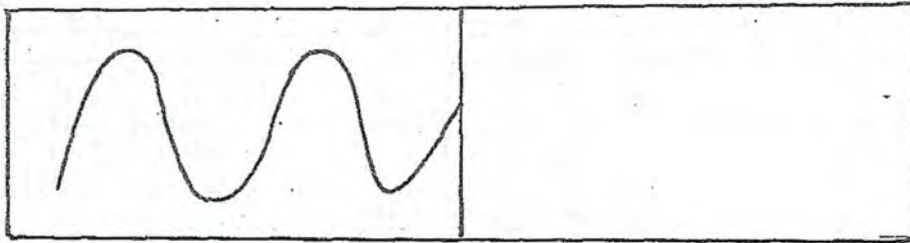


fig 6

Sketch the appearance of the wave in the deep region on the same diagram

(1mk)

13. Figure 7 below shows a circuit that may be used to charge a capacitor

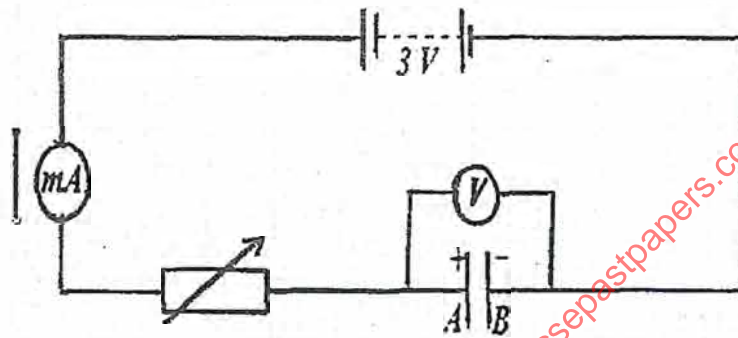


fig 7

State the observation made on the following after the switch is closed.

(i) Millimeter

(1mk)

(ii) Voltmeter

(1mk)

SECTION B

14. a) Give a reason why parabolic reflectors are preferred when constructing car head lamps (1mk)

b) Figure 8 below shows an object placed in front of a convex mirror

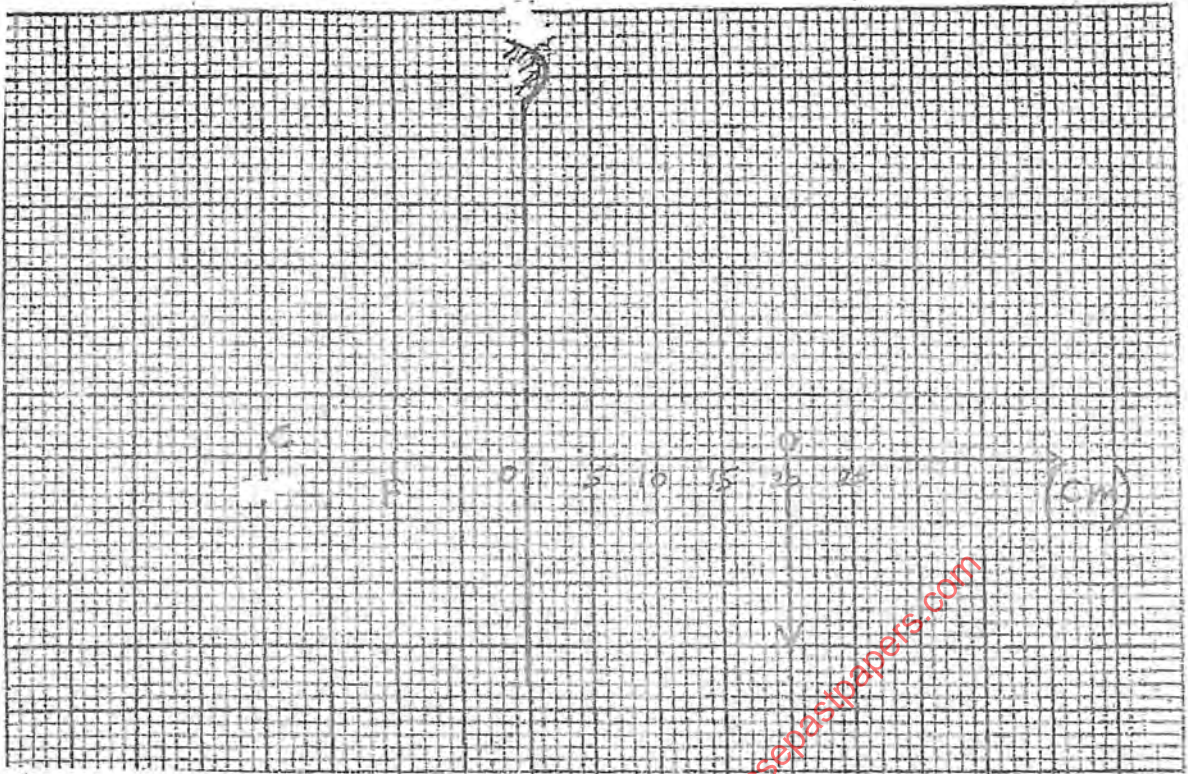


fig 8

(i) By graphical method, locate the image formed (3mks)

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(ii) State the image position (1mk)

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(iii) State any one characteristic of the image formed (1mk)

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c) By use of a ray diagram, show how a concave mirror may be used by a dentist (2mks)

15. A) Figure 9 below shows a steel bar set to be magnetized.

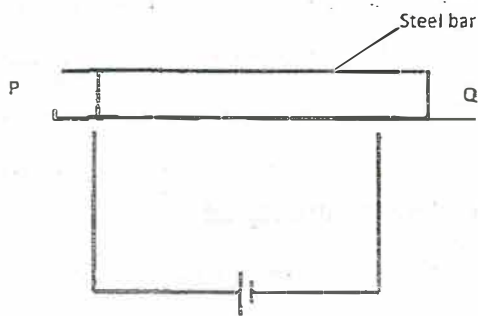


fig 9

Complete the circuit such that both poles P and Q acquire opposite polarity (North – South respectively) (1mk)

b) A bare copper wire XY lies over the fixed wires A and B connected to a battery. When the key in the circuit is closed, the wire XY experiences a force.

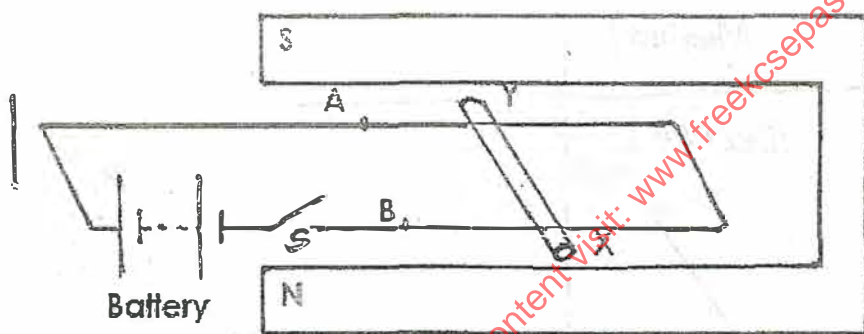


fig 10

(i) In which direction does the wire XY experience the force? (1mk)

(ii) When is the force on the wire XY greatest? (1mk)

(iii) What is the effect of reversing both the magnetic field and direction of flow of current? (1mk)

(iv) Name one instrument which uses the effect demonstrated in figure 10 above (1mk)

c) (i) State two ways in which an electromagnet could be made more powerful (2mks)

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.....
.....

(ii) One other application of an electromagnet (1mk)

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.....

16. a) State any one condition necessary for total internal reflection to occur (1mk)

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.....

b) Figure 11 below shows a ray of light incident on the boundary between two media, 1 and 2, at an angle θ

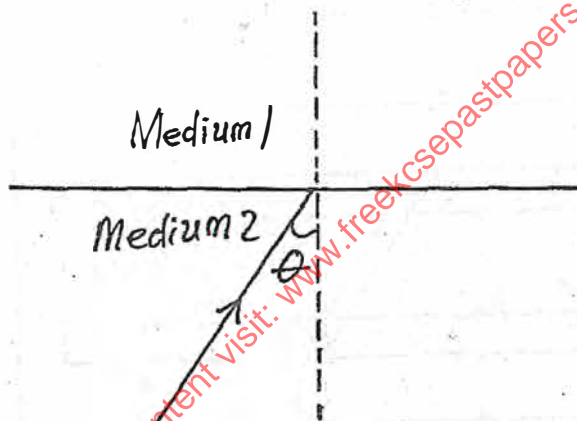


fig 11

Show that the refractive index for a ray of light traveling from medium 2 to 1 is given by

$$n_2 = \frac{1}{\sin \theta} \quad (2mks)$$

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

c) Figure 12 shows rays of light AO, BO, and CO incident on a glass – air interface. OA¹, OB¹ and OC¹ are the corresponding emergent rays.

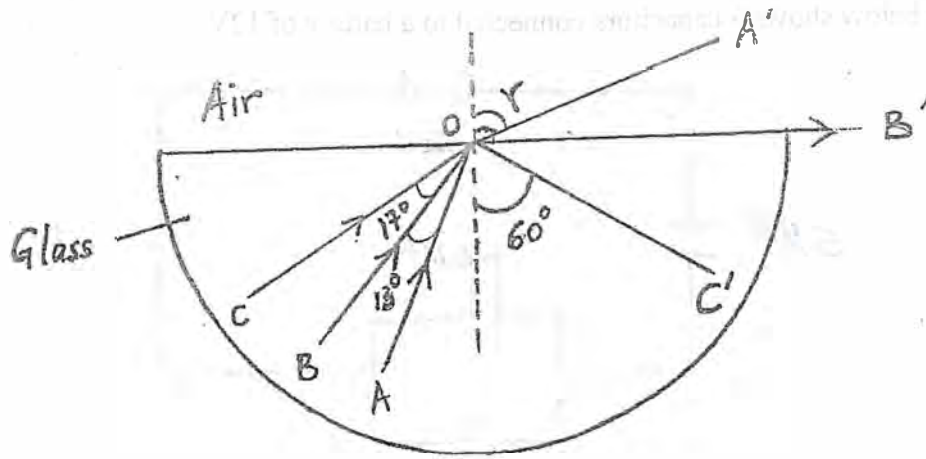


fig 12

(i) Determine the critical angle of the glass material (1mk)

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(ii) Determine the refractive index of the glass (2mks)

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(iii) Determine the value of the angle r (3mks)

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17. a) Define the term capacitance and state its SI unit. (2mks)

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b) Figure 13 below shows 3 capacitors connected to a battery of 12V

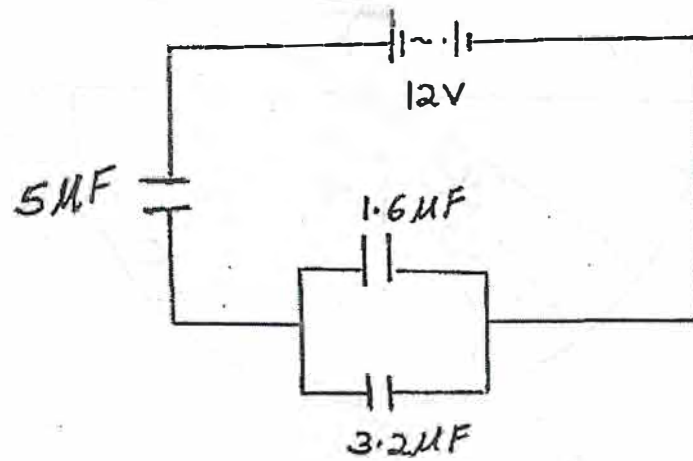


fig 13

Determine;

(i) The effective capacitance in the circuit (2mks)

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.....

(ii) Charge across the 5μF capacitor (2mks)

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.....

(iii) Voltage across the 1.6μF capacitor (2mks)

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c) State two uses of capacitors. (2mks)

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18. a) State one factor that determines the resistance of a given conductor (1mk)

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.....

b) The cell in figure 14 has an E.M.F of 24V and negligible internal resistance

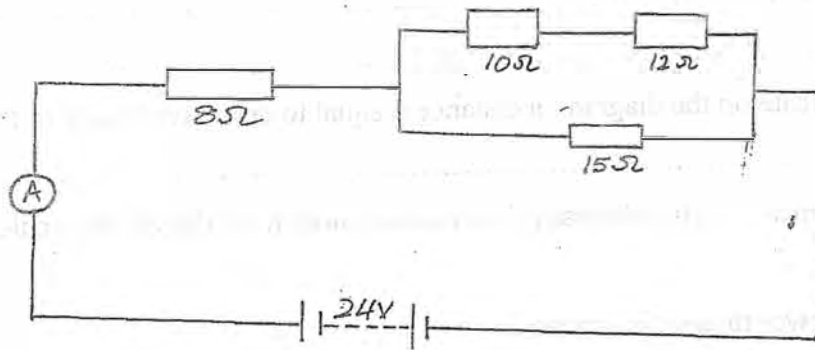


fig 14

Determine;

(i) the total resistance in the circuit (3mks)

.....

.....

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(ii) the reading of the ammeter (2mks)

.....

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(iii) the current through the 15Ω resistor (2mks)

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(iv) voltage across the 15Ω resistor (2mks)

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a) Figure 15 shows waves produced in air by a ruler clamped vertically and the free end made to vibrate about the rest position. R is an air molecule in the path of the waves.

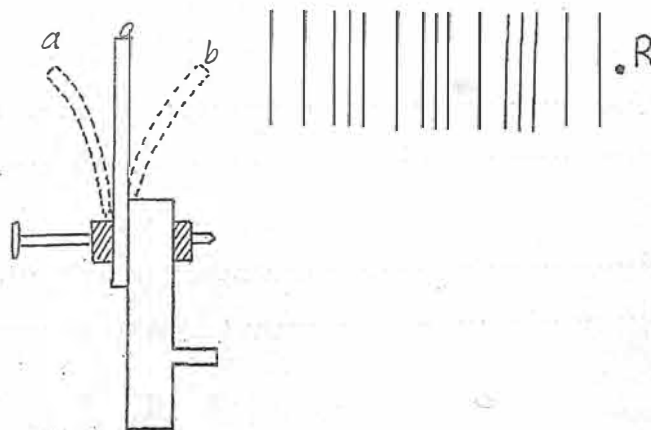


fig 15

(i) Name the type of wave generated by the vibrating ruler (1mk)

.....
.....

(ii) Using lines, indicate on the diagram, a distance d equal to one wave length of the wave (1mk)

.....

(iii) Show with an arrow on the diagram direction of motion of the air molecule R as the waves pass (1mk)

(iv) Explain your answer to part (iii) above (1mk)

.....

b) The movement $O \rightarrow a \rightarrow O \rightarrow b$, takes 0.8 seconds. Determine the frequency of vibration of the blade (2mks)

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c) Students set up a ripple tank with a vibrator and two spherical dippers near the ends of a ripple tank. Figure 16 shows part of the crests of the circular waves that spread from the two dippers.

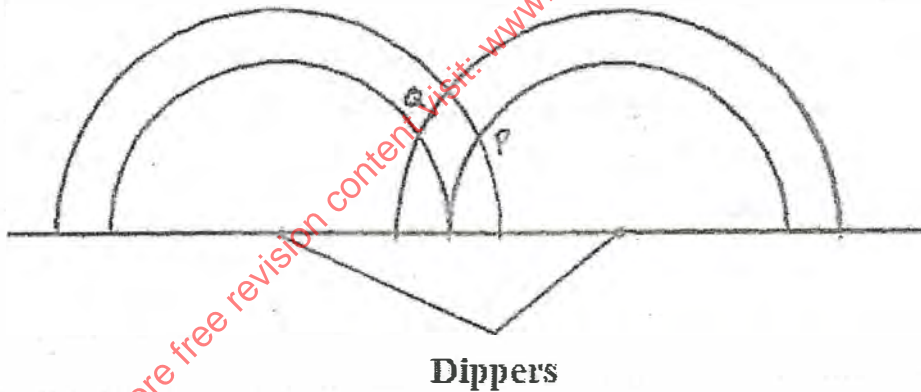


fig 16

Given that the amplitude of each wave is 4cm. State with a reason, the amplitude of the waves at points; (4mks)

(i) P

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(ii) Q

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