KENYA NATIONAL EXAMINATION COUNCIL
KCSE, 2014

PHYSICS PAPER 2 ANALYSIS

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3.4.3 Physics Paper 2 (232/2

Question 6

It is observed that when the cap of an uncharged electroscope is irradiated with light of high frequency, the leaf of the electroscope rises. Explain this observation. (3 marks)

Candidates were required to explain the effect of irradiating an uncharged electroscope with a light of high frequency.

Weakness

Many students were unable to relate the light of high frequency to photoelectric emission that causes electrons to be dislodged from the electroscope hence creating a net positive charge. Many students did not state the reason for increased leaf divergence as repulsion between the leaf and stem

Expected response

Electrons arbsorb enough energy and are ejected leaving the electroscope positively charged the leaf is repelled by the stem.

Question 8

Figure 5 shows a graph of current against voltage for a semiconductor diode.

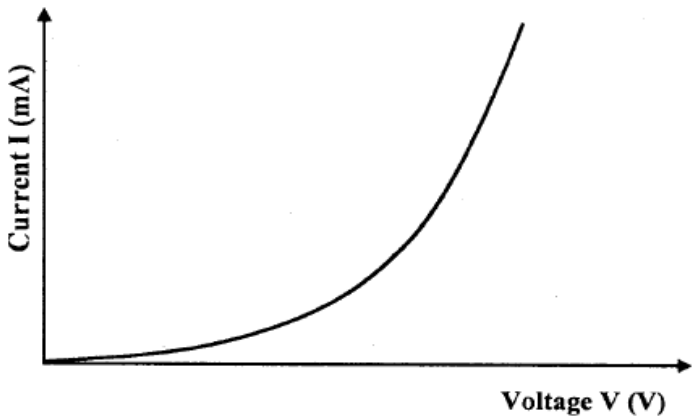


Figure 5

In the space provided, draw a circuit diagram that may be used to obtain values needed to draw the graph in **figure 5**. (3 marks)

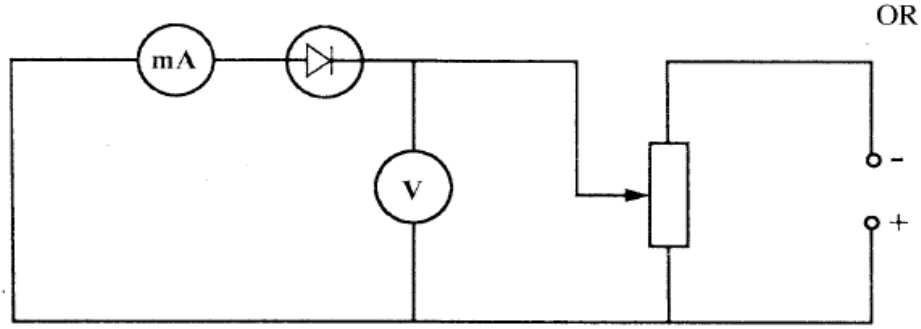
Candidates were required to draw a circuit diagram showing how to derive forward biased diode characteristics.

Weakness

Some candidates did not bias the diode i.e failed to indicate the positive and negative terminals, some did not use conventional meter symbols and others did not include ammeter, or voltemeter. Many used a normal resistor in the place of a varying resistor.

Expected response

OR equivalent



Question11

The anode of an x-ray tube becomes hot when the tube is in use. State the reason for this.
(1 mark)

Candidates were required to state the reason why heat is produced at the anode of an X ray tube.
Most candidates are aware of how the x – ray tube operates but failed to link the heat energy to the kinetic energy of the electrons.

Expected response

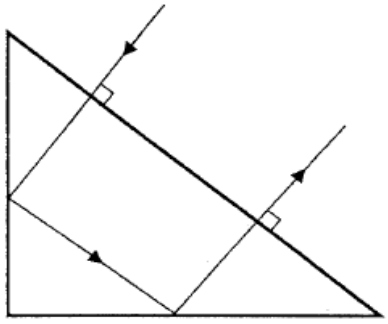
It stops the fast moving electrons √ whose kinetic energy is converted to heat.

Question12

Draw a ray diagram to show how a ray of light may be totally internally reflected two times in an isosceles right - angled glass prism. (*Assume that the critical angle of glass is 42°*)
(2 marks)

Weakness
Many candidates were not able to draw a right-angled glass prism in two dimensions. They were not able to have the incident ray on the hypotenuse for it to undergo internal reflection twice.

Expected response



1 mark for ray incident on hypotenuse

1 mark for showing two internal reflections

Question17

(a) **Figure 9** shows two speakers S_1 and S_2 which produce sound of the same frequency. They are placed equidistant from a line AB and a line PQ. (*PQ is perpendicular to line AB*).

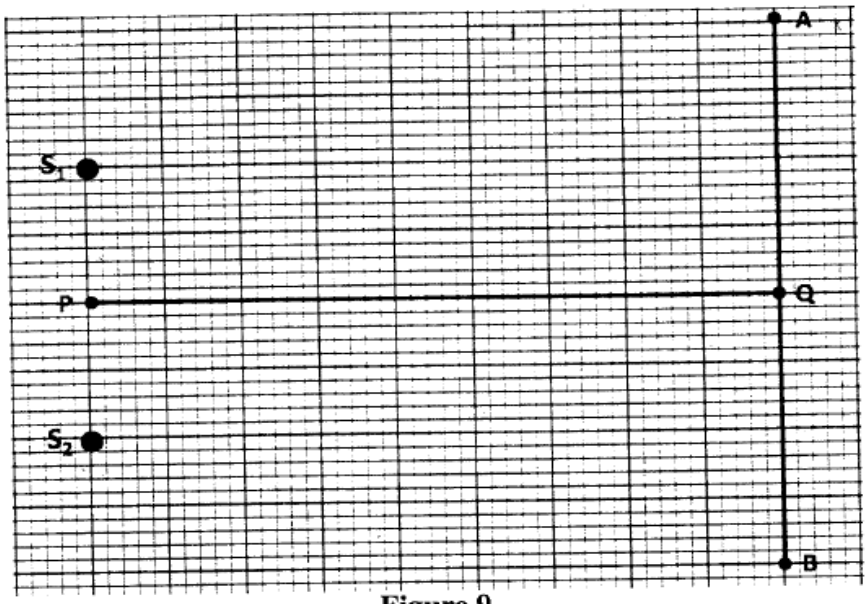


Figure 9

(i) A student walking from A to B hears alternating loud and soft sounds. Explain why at some point the sound heard is soft. (2 marks)

(ii) The student now walks along line PQ. State with reason the nature of the sound the student hears. (3 marks)

(b) **Figure 10** shows sound waves in air produced by a vibrating tuning fork. R is an air molecule on the path of the waves.

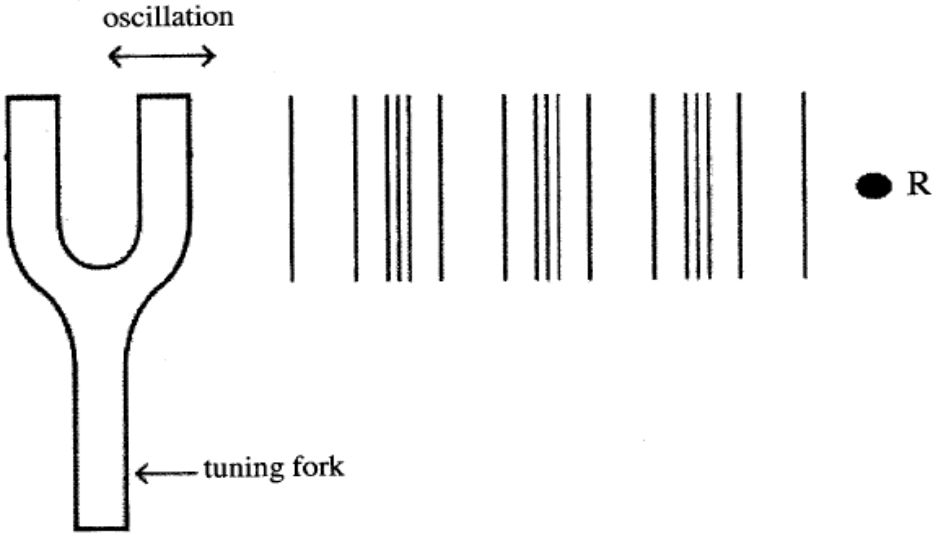


Figure 10

(i) Using a line, indicate on the diagram a distance **d** equal to one wavelength of the wave. (1 mark)

(ii) In the space provided, show with an arrow the direction of motion of the air molecule R as the waves pass. (1 mark)

This question was on the topic sound and required candidates to show knowledge of characteristics of sound waves, types of waves – longitudinal and transverse.

Weakness

Candidates lacked knowledge on the concept of waves being in phase or out of phase. Many candidates were not able to visualize the motion of a particle in the path of a longitudinal wave.

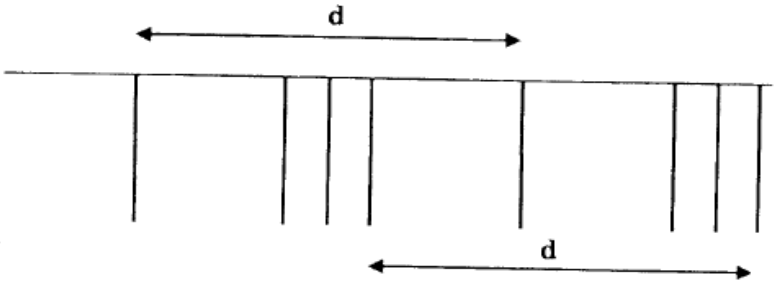
Expected response

(a) (i) (I) sound is soft when the waves arrive out of phase; √
such waves undergo destructive interference.

(ii) same sound - loud. √

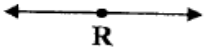
- Along PQ the waves undergonconstructive intereference as they arrive in phase. √

(b) (i)



✓ -any correct d

(ii)



√

(iii) As the longitudinal waves pass √ molecule R moves along to either side.
For a crest, R moves away from source.