

NAME.....Adm No.....

School.....

Class.....

232/2  
PHYSICS  
Paper 2  
(Theory)  
Jan/Feb 2011  
2Hours

BUNYOREMARANDA ENROLMENT EXAMS- 2011  
Kenya Certificate of Secondary Education (K.C.S.E)  
PHYSICS  
Paper 2  
(Theory)  
Jan/Feb 2011

**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 section A and B in the spaces provided*
- *ALL working MUST be clearly shown.*
- *Mathematical tables and electronic calculators may be used.*

**FOR EXAMINERS USE ONLY**

Section	Question	Maximum score	Candidate's score
A	1-10	25	
	11	08	
	12	14	
	13	12	
	14	12	
	15	09	
TOTAL SCORE		80	

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

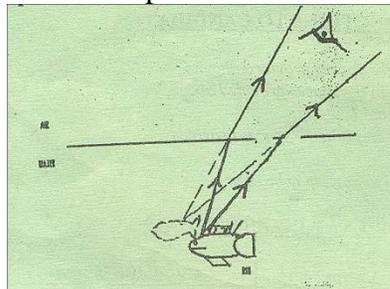
SECTION A 25( MARKS)

1. When a building that has some pockets of moisture in the walls is struck by lightning it develops some cracks. Explain. (2mks)

2. The following are three electrical components.

- (i) A component which obeys ohms law
- (ii) A component obeying ohms law but of higher resistance
- (iii) A filament lamp or the above sketch a current voltage graph in the same diagram. (3mks)

3. The figure below shows an eye when observing fish in a pond. Complete the ray diagram to show the actual position of fish and the position after refraction. (2mks)



4. The far point of a defective eye is 2 m

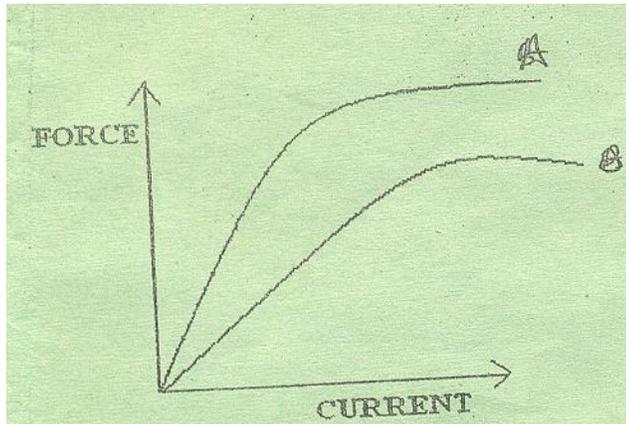
- (i) What lens is needed to correct this defect? (1mk)
- (ii) With this lens at what distance from the eye is its near point if the near point without the lens is 25cm. (3mks)

5. A moving coil loudspeaker has the speech coil connected to a paper cone.

- i) Why is the area of the cone large?
- ii) Describe and explain what happens to the coil and what is heard when a dry cell is attached to the terminals of loudspeaker and the current is switched on and off. (3mks)

Define resonance as used in musical instruments. (1 mk)

7. The graph below shows the relationship between the attractive force of an electromagnet and the magnetizing current. Give a reason for the shape of the curve s in terms of Domain theory of magnetism. (3mks)



8. In the space below draw a diagram to show how the air in closed pipe vibrates with a frequency of the third overtone. (2mks)

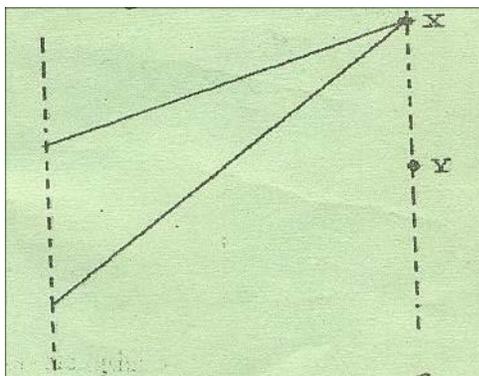
9. Explain what happens when the cap of a charged electroscope is connected to the cap of uncharged electroscope using a copper wire.

10. State two conditions for a ray to undergo total internal reflection.

### SECTION B (55mks)

11. (i) Explain how coherent waves are produced in a ripple tank.

(ii) The diagram below shows two waves coming from different sources and meeting at X.



- (a) What is the path difference at X measured in wavelengths.
- (b) What would the observer at X notice if the waves were sound waves. (1 mk)

(c) At point Y the path difference is half a wavelength less than at X. what would observer at Y now notice if they were water waves. (1mk)

(iii) Waves enter a harbor at a rate of 45 crests per minute. A girl watches a particular wave crest passing two post which are 9m apart along the direction of travel of the waves. The time it took to move one post to the other is 3 seconds. Determine:

(a) The frequency of the wave motion. (1 mks)

(b) The wavelength of the wave. (2mks)

12 (a) Distinguish between open and closed circuit. (2mk)

(b) 200 resistors are to be connected so that a current of 4A flows from 100V source. How many resistors are to be connected. (3mk)

(c) The figure below shows a current through 0.8A passing through an arrangement of four resistors. Calculate the current through the 10 resistor. (4mks)

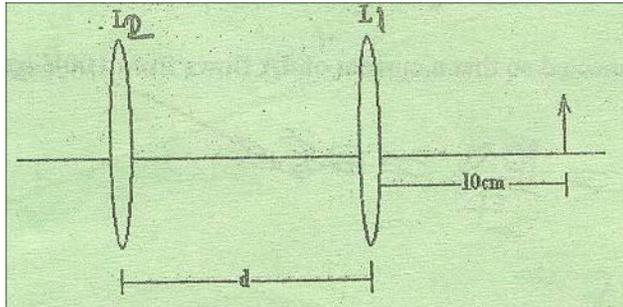
(d) Describe an experiment you would perform to determine the internal resistance a cell. (5mks)

13 (a) Define the term accommodation as used in optics. (1 mk)

(b) A Student wanted to study an onion cell during a biology practical lesson in the laboratory. He had a Converging lens to do this. Sketch a ray diagram to show how the student would arrange the lens and the specimen to allow him see an upright and magnified image. (3mks)

(c) State one similarities between an eye and a camera. (1mks).

(d) Two converging lenses whose focal lengths are  $F_1 = 15\text{cm}$  and  $F_2 = 10\text{cm}$  are arranged to have a common axis as shown in the diagram below.

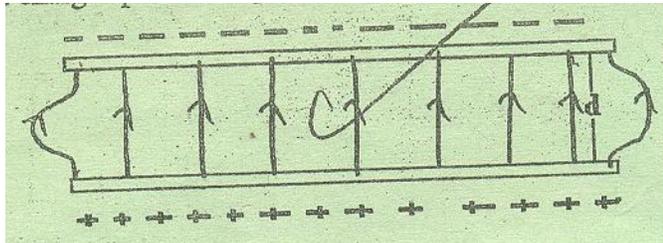


An object  $O$  is placed  $10\text{cm}$  from  $L_1$ . Given that the final image  $s$  formed  $20\text{cm}$  to the right of  $L_2$  determine the separation distance between the two lenses. (3mks)  
 e) Ager a form 4 student drew a graph of  $1/V$  against  $i/U$  and obtained the axes intercepts as  $2.5 \times 10^{-2}\text{cm}$  and  $23 \times 10^{-2}\text{cm}$  respectively. Use these values to determine:

- (i) Focal length of the lens used. (3mks)
- (ii) Power of the lens used. (2mks)

14. a) Define charge density, (1mk)

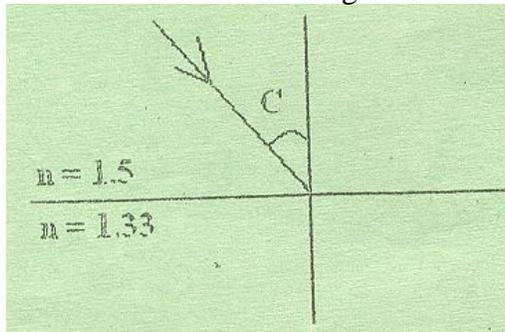
(b) The figure below shows the charged plates of a parallel plate capacitor where the distance  $d$ , is small.



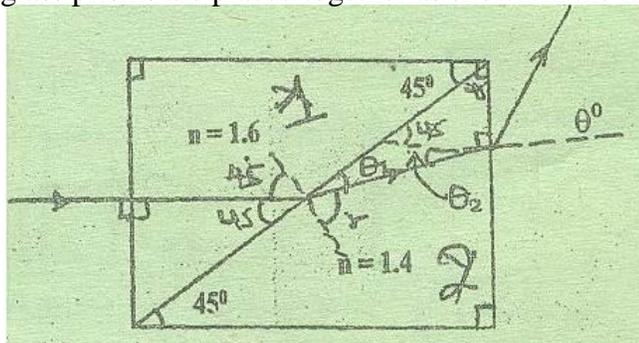
- (i) Complete the diagram to show the electric field pattern in the space between the plates. (1 mk)
- (ii) Without changing the distance  $d$  between the plates, suggest the method by which you could increase the capacitance of the capacitor. (1 mk)

(c) State a device where a variable air capacitor could be used. (1 mk)

b) Determine the value of C in the figure below.

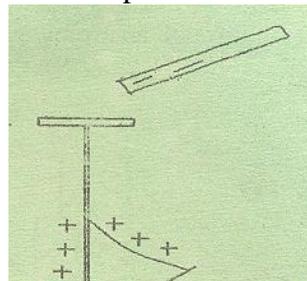


c) Two glass prisms are placed together as shown in the figure below: (3mks.)



If a beam of light strikes the face of one of the prisms normally as shown, at what angle  $\theta^\circ$  does the beam emerge from the prism? (4mks)

d) The figure below shows a highly negatively charged rod being brought near the cap of a positively charged electroscope.



State and explain what will be observed happening to the leaf of the electroscope

e) A 5tF capacitor is charged by 40V supply and then connected across uncharged 2011F capacitor. Calculate:

- (i) Final voltage across the capacitor.
- (ii) Final energy stored by the capacitor.

15. (a) The refractive index a glycerin is greater than that of water. With regard to this information State:

- (i) The path of the monochromatic ray of light passing from water into a layer of glycerin floating on top of it.
- (ii) The relative speed of light in water and glycerin.