

PHYSICS PAPER 232/2

TIME 2HR

**Instructions to the candidates**

*This paper consists of two sections A and B.*

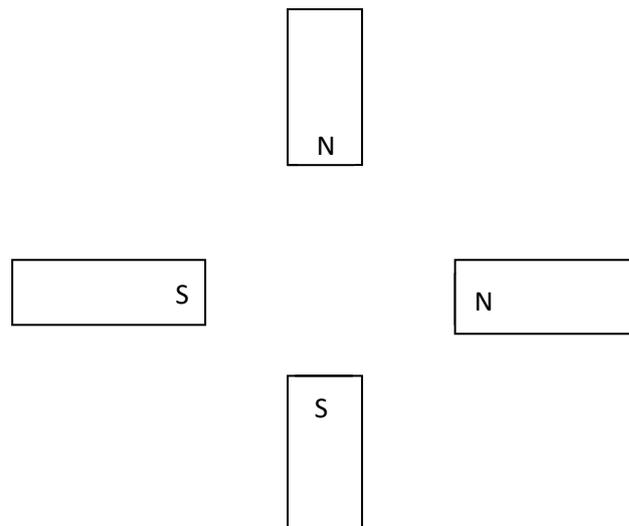
*Answer all the questions from both sections in the spaces provided*

*All working must be clearly shown. Numerical answers should be expressed in standard form.*

*Electronic calculators or mathematical tables may be used.*

**Section A (25mks)**

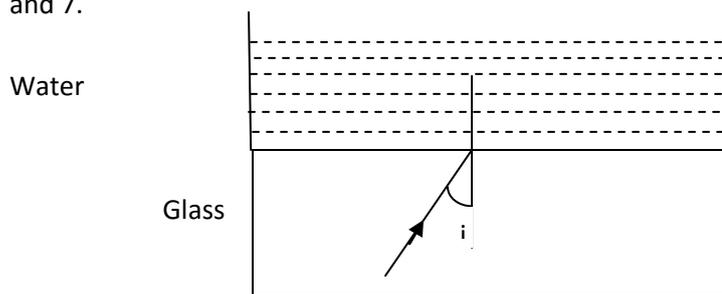
- 1) Omali was window shopping in Nakuru and every time he observed items through the glass window he hit it by the forehead. Which of the properties of light waves was not exhibited by the glass and why? (2mks)
  
- 2) Atieno decided to re-charge her lead acid battery. State two measurable quantities that indicated that the battery is ready for re-charging.(2mks)
  
- 3) State one application of electrostatics.(1mk)
  
- 4) The figure 1 below shows four bar magnets.



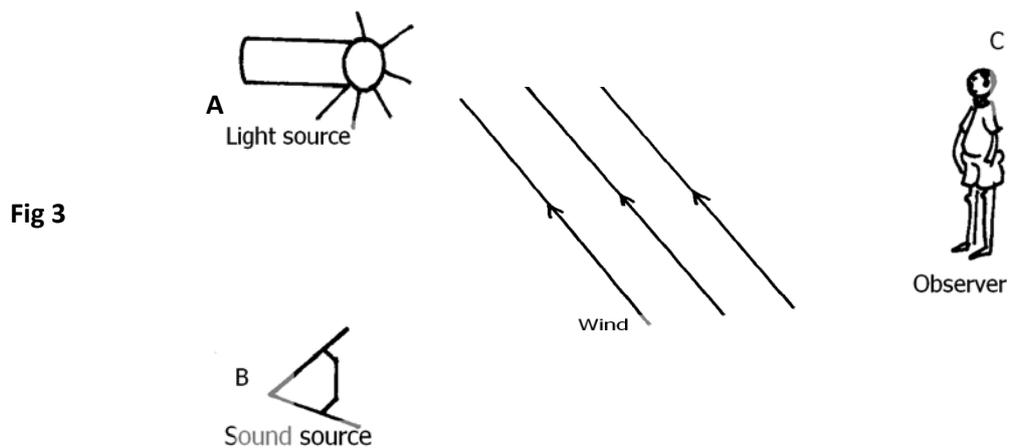
Complete the diagram to show the magnetic fields. (3mks)

- 5) Two trains A and B are 12km apart and each 8km at right angle to a tall wall at the station. The train A blows its horn and a passenger in train B hears two separate reports. Calculate the time interval between the two reports heard by this passenger. The speed of sound in air is 330m/s.(3mks)

The figure 2 shows a ray of light travelling from glass into water .use this figure to answer ques. 6 and 7.



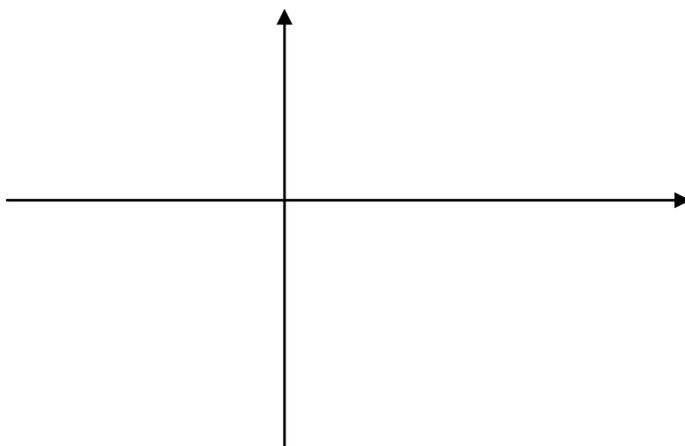
- 6) Complete the diagram to show how the ray travels through the two media. (1mk)
  - 7) What determines the amount of bending and the direction of light through the medium? (1mk)
- 8) . Figure 3 below shows an observer facing light source A and sound sources producing sound B.



If the wind blows as shown, state and explain what will be noted by the observer atC. (3mks)

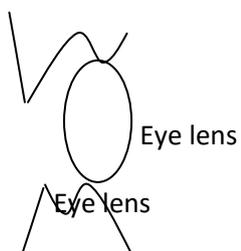
9) Distinguish between intrinsic and extrinsic semi-conductor. (1mk)

10) Sketch on the axes provided the reverse bias characteristics of a diode. (2mks)

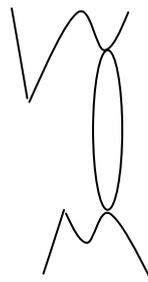


11) The police and boda boda operators wear jackets made of materials which glows at night when light falls on them. State the electromagnetic wave associated with this. (1mk)

12) The figure 4 shows eye lens in two difference situations of viewing.



A



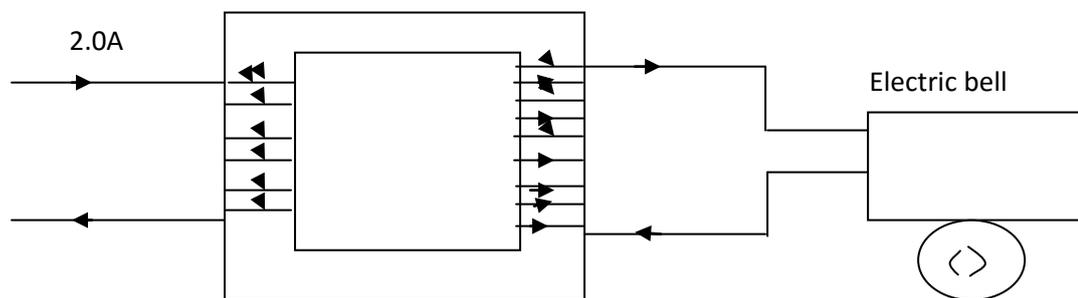
B

i) Identify the diagram in which the observer is viewing a distant object. (1mk)

ii) Give a reason for your answer in i) above. (1mks)

13) Omwami is an X-ray operator and wants to produce hard X-rays. Distinguish between hard and soft X-rays(1mks)

14) The figure 5 is transformer used by a student to operate an electric bell.



Determine the current flowing through the bell. (2mks)

### Section B (55mks)

Answer all the questions in this section in the spaces provided.

15. a) Define the term "Work function"

(1mk)

b) The table below shows the value obtained by form IV students while investigating how maximum kinetic energy of the photoelectrons, emitted from a zinc cathode, varies with the frequency of the incident radiation.

k.e $\times 10^{-19}$ J	0.5	1.0	1.5	2.0	2.5	3.0	3.5
Frequency $f$ ( $\times 10^{14}$ ) Hz	4.7	5.9	7.0	8.3	9.5	10.7	11.9

i) Plot a graph of K.e against frequency. (5mks)

From the graph determine

ii) The threshold wavelength of the metal Zinc. (2mks)

iii) The plank constant.

(3mks)

c) State two factors that affect photoelectric effects of a given metal surface. (2mks)

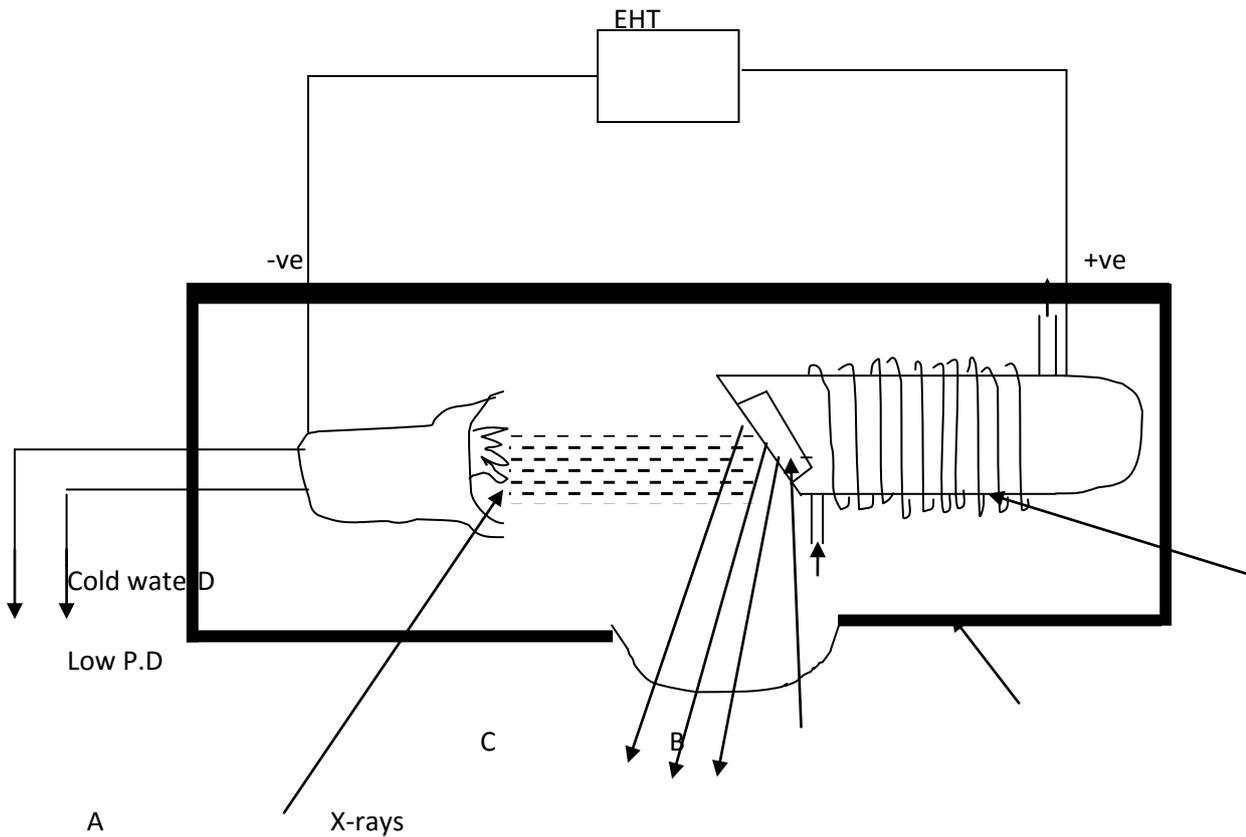
d) Distinguish between photoelectrons and thermo electrons.

(1mk)

16 a) distinguish between X-rays and cathode rays.

(2mks)

b) The figure 4 shows an X-ray tube. Use it to answer the following questions



c) Name the parts labeled(4mks)

- A.....
- B.....
- C.....
- D.....

i) State the functions of A and C. (2mks)

- A.....
- C.....

ii) What adjustment on the x-ray tube will?

- I) Increase the hardness of the x-rays (1mk)
- II) Reduce the intensity of the x-rays. (1mk)

C. (i) An x-ray tube has an accelerating voltage of 50KV. Determine the shortest wavelength of X-ray beam given that plank constant= $6.64 \times 10^{-34}$ Js, electron charge $1.6 \times 10^{-19}$ C and velocity of electromagnetic waves  $C= 3 \times 10^8$ m/s.(3mks)

d) State two applications of X-Rays.

(2mks)

17) a) Define radioactivity. (2mks)

b) Explain how you would separate the three radiations emitted by a radioactive substance. (3mks)

c)An isotope of uranium  $^{238}_{92}\text{U}$  decays by emitting an alpha particle and a beta particle forming a new element M. Write down an equation for the reaction. (2mks)

d) Hannah discovered a radioactive substance which gave 118counts/minutes. She noted that the background count was 18c/min. after 6hours the count rate had dropped to 24.25c/min.

i) Calculate the half-life of the radioactive substance.(3mk)

ii) State two precautions that Hannah should take while working with the radioactive substance.

(2mks)

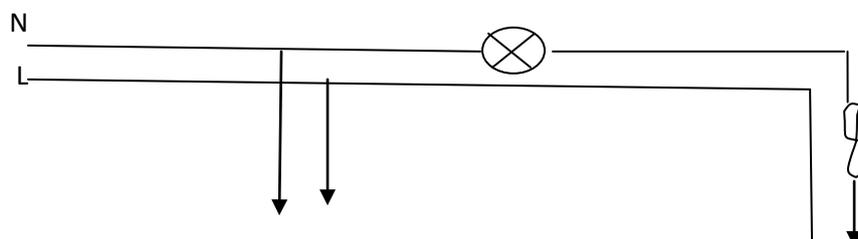
c) Give an application of radioisotopes.(1mk)

18) a) Mains electricity is transmitted at high voltage from the main power station to other sub-station .

Give one danger of transmitting power at a high voltage. (1mk)

b) The figure 5 shows a section of a housecircuit made by a form 4 student.

i) Point out the serious mistake that were done in the wiring. (2mks)



B

ii) Explain how the problems can be corrected. (1mk)

iii) What is the purpose of the part labeled B?(1mk)

c) Mrs. Kariuki has an electric stove rated 2.5Kw, an electric pressing box 1.0Kw, an electric cooker rated 1.0Kw and an electric fan 500W in her house. Her mains supply is 240V and the fuse current is 15A:

i) Can she connect the entire four appliances at the same time? Give reason for your answer. (2mks)

ii) If electricity cost 6.50/- per Kilowatt-hour, calculate the cost of using the stove and electric pressing box for 3 hours a day in the month of June. (3mks)