KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

ALLIANCE BOYS HIGH SCHOOL
PHYSICS
Paper 2

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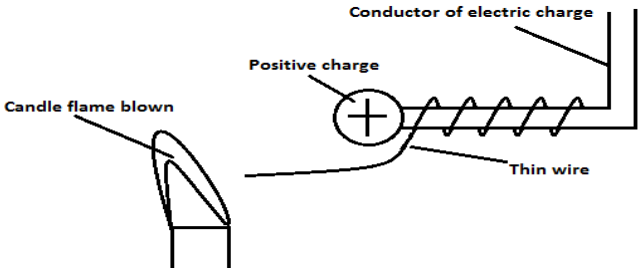
ALLIANCE BOYS HIGH SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

Paper 2

SECTION A (25 MARKS)

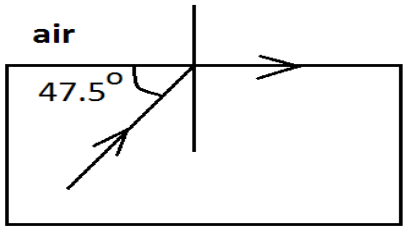
1. The figure below shows a thin wire connected to a charge generator and placed close to a candle flame.



Explain why the candle flame is deflected as shown. (3 marks)

2. State the meaning of the term "threshold frequency" as used in photoelectric emission. (1mark)

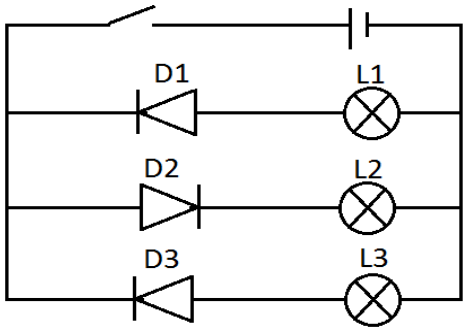
3. The figure below shows the path of light passing through a rectangular block of perpex, placed in air.



Calculate the refractive index of the Perspex. (2 marks)

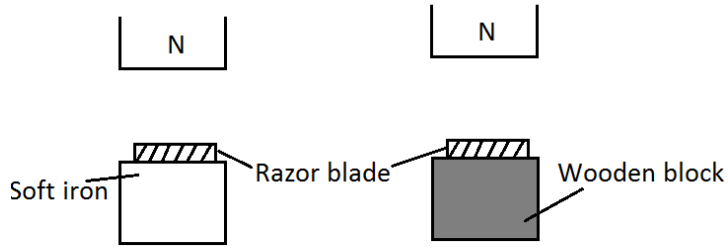
4. A radio signal of 30MHz is received by an aerial whose length is 1/8 th of its wavelength. If the speed of light is 3.0×10^8 m/s determine the length of the aerial. (3 marks)

5. The figure below shows an electric circuit with three diodes, three bulbs and a cell. State and explain what would be observed when the switch is closed. (2 marks)



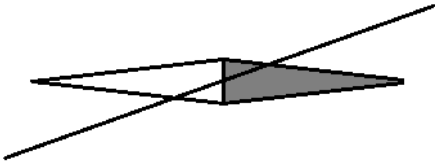
6. What property of cathode rays shows that they are particles and not waves? (1 marks)

7. Two similar razor blades are placed one on a wooden block and the other on a soft iron block as shown in the figure below

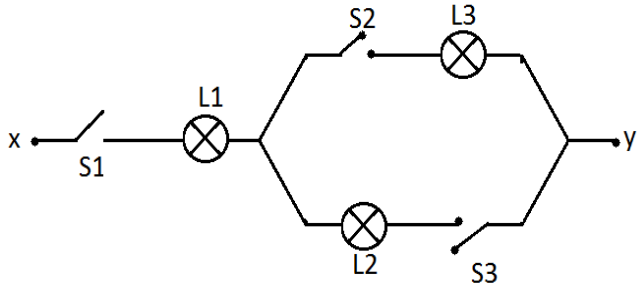


It was observed that the razor blade on the wooden block was attracted to the magnet while the other on the soft iron block was not. Explain. (2 marks)

8. The figure below shows a wire carrying current placed over a magnetic compass. On the wire, indicate the direction of electric current. The shaded side is the North Pole. (1 mark)



9. Differentiate between a capacitor and capacitance. (1 mark)
10. A 10µF capacitor is charged by a 100 V supply and then connected a cross an uncharged 20µF capacitor. Calculate the final p.d on each capacitor. (3 marks)
11. Fig. 7 shows an electric circuit including three switches, S_1, S_2, S_3 and three lamps L_1, L_2, L_3. A constant potential difference is applied across X and Y.



i) Other than L_1, state the lamp that will light when S1 and S_2 are closed (1 mark)

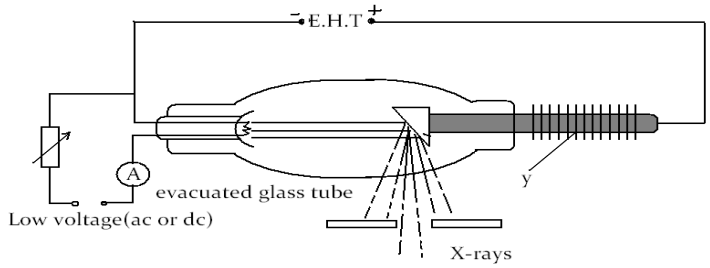
ii) How does the brightness in L1in i) above compare with its brightness when all the switches are close. (1 mark)

iii) Explain the observation in ii) above. (1 mark)

12. During total eclipse of the sun, both light and heat are observed to disappear simultaneously. Explain the observation. (2 marks)

SECTION B (55 MRKS)

1. The figure below shows an X-ray tube.



a) Label the part marked Y. (1 mark)

b) How would one increase

i). The intensity of the X –rays. (1 mark)

ii). Penetrating power of the X –rays. (1 mark)

c) Explain why the tube is highly evacuated. (2 marks)

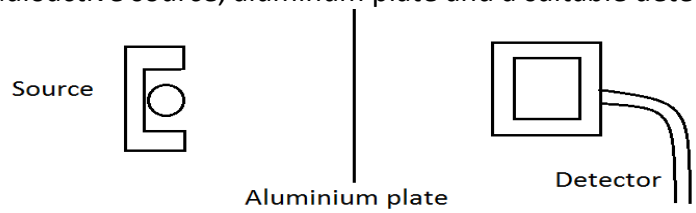
d) An X –ray tube operating with an anode potential of 10 kV and current of 15Ma.

i) Calculate the number of electrons hitting the anode per second. (3 marks)

ii) Determine the speed with which the electrons hit the target (3 marks)

(charge of an electron, $q=1.6\times10^{-19}C$, mass of an electron $M_e=9.1\times10^{-31}$ kg.)

2. A radioactive source, aluminum plate and a suitable detector were arranged as shown below.



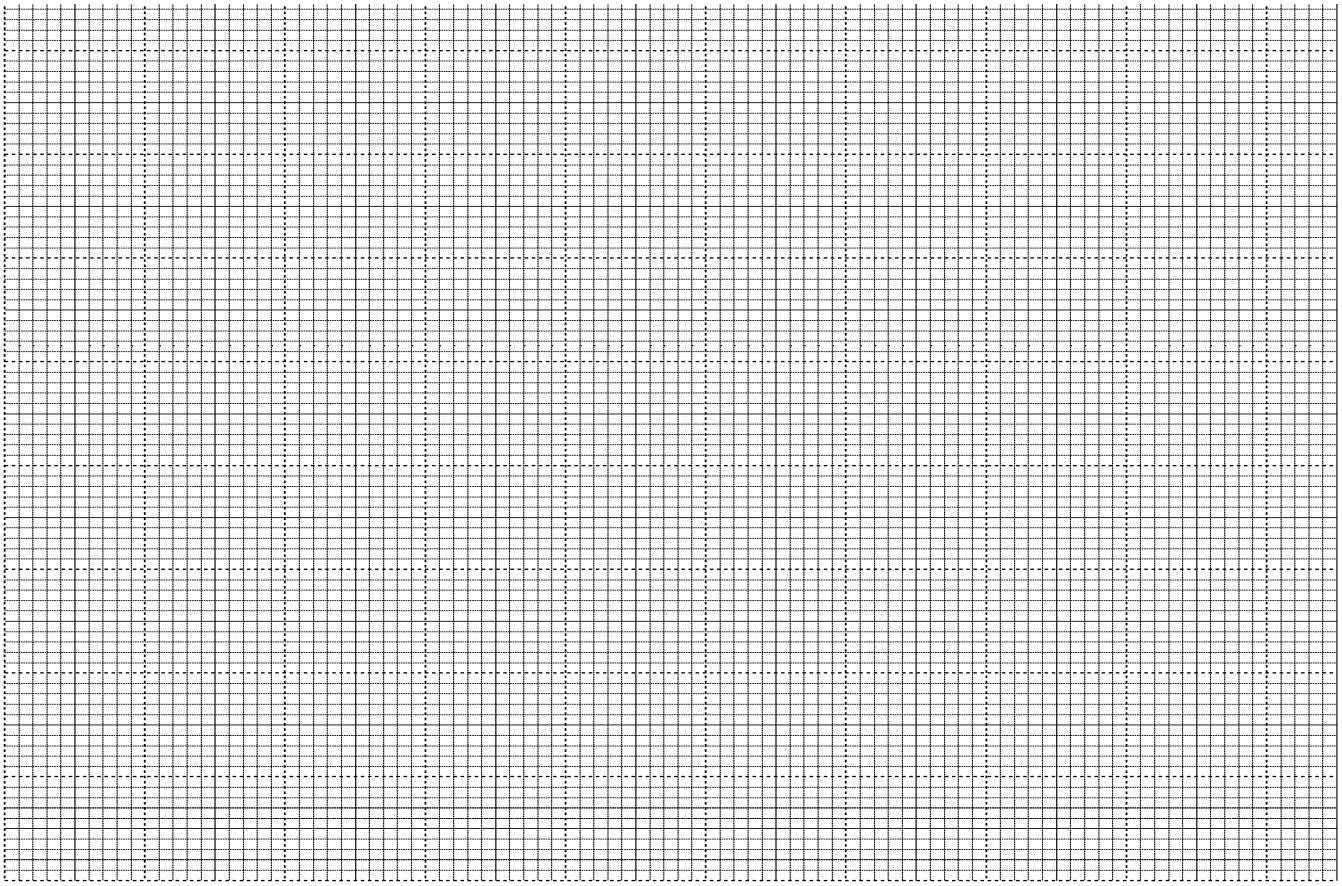
a)

i) Before the source was introduced, the detector registered a reading of 40 counts per second. Explain this observation. (1 mark)

ii) The following readings were obtained using a radioactive detector and a timer.

Count rate(counts/s^{-1})	1440	1272	1128	840	624	480	360	264	204	180
Time	0	3	6	12	18	24	30	36	42	45

i). Plot a graph of count rate against time on the grid provided below (5 marks)



a. Use the graph to obtain the half life of the source. (1 mark)

b. Using the half life determine how long it would take for the count rate to fall from320 to 40 counts per second. (2 marks)

3.

a) Define the term electromagnetic spectrum. (1 mark)

b) Your radio is tuned into a radio station 144km away.

i). How long does it take the signal to reach your receiver? (2 marks)

ii). If the signal has a frequency of 600 KHz, how many wavelengths is the station from your receiver.

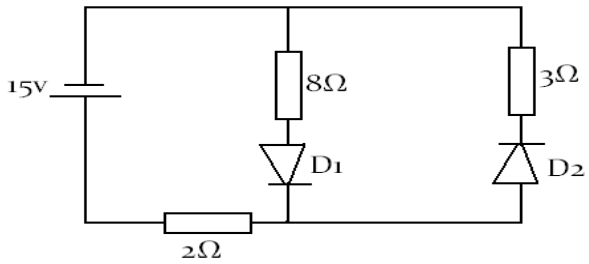
(Take C=3.0x10^8 m/s) (3 marks)

c) State the function of magnetron in a microwave cooker. (1 mark)

a) Sketch the circuit symbol of a semiconductor diode and name its parts.(2 marks)

b) What is rectification (1 mark)

c) Study the diagram below and answer the following questions

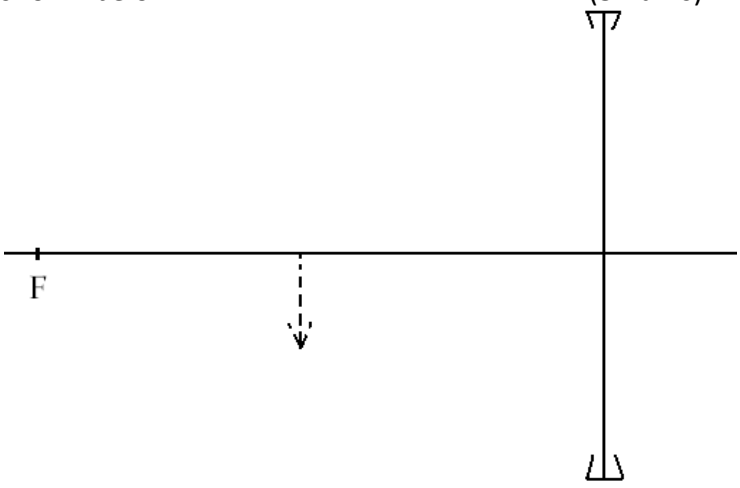


i). Calculate the current flowing through the 2Ω resistor. (2 marks)

ii). Calculate the voltage drop across the 3Ω resistor. (3 marks)

4.

a) Complete the diagram below indicating the rays that will lead to the formation of the image shown below (3marks)

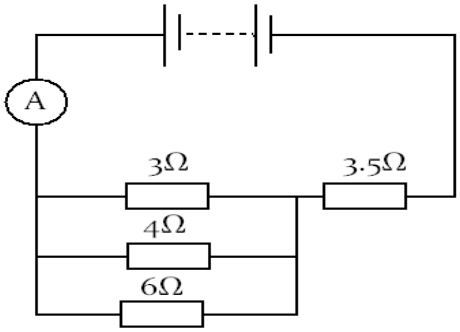


b) A compound microscope with an objective lens L_o of focal length 1.2cm and an eye piece lens L_e of focal length 2.8cm. An object is placed 1.8cm from the objective lens. The system of lenses produces a final image a distance of 12.0cm from L_e. Determine the distance of separation of lens L_o and L_e.

(4 MARKS)

c) An object is placed 12cm from a convex lens and it forms a virtual image 36cm from the lens. Calculate the focal length of the lens. (3 MARKS)

a) The diagram below show a battery of e.m.f 12V and an internal resistance of 0.17Ω connected to a combination of resistors.



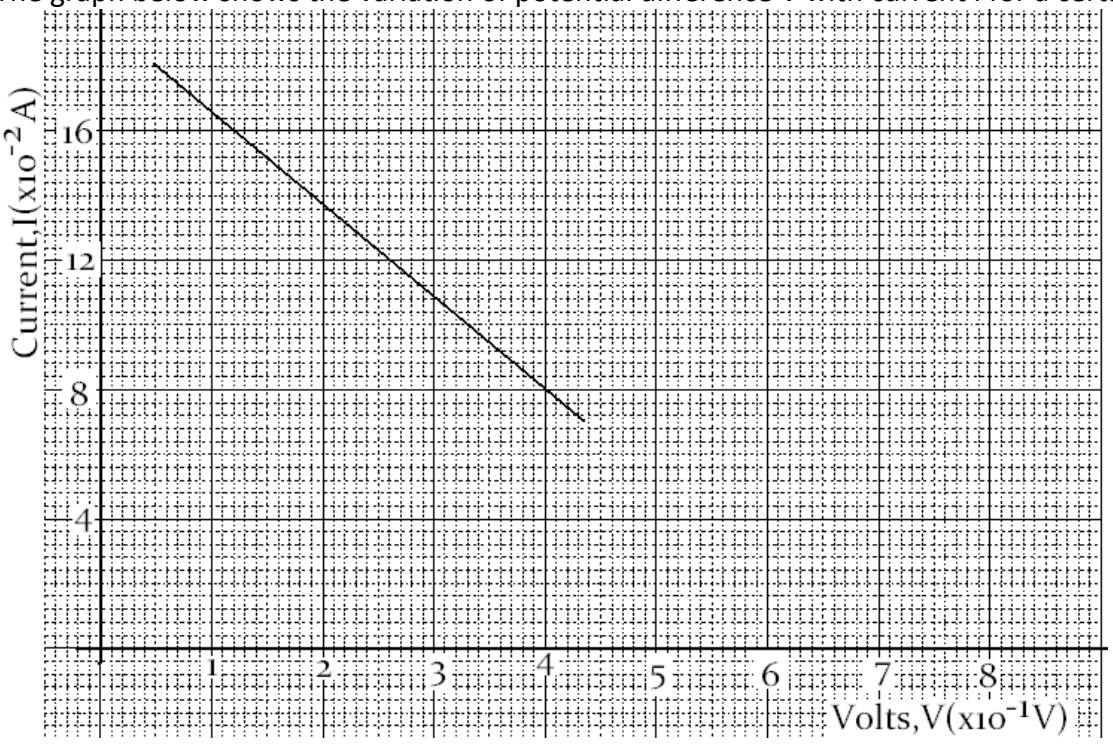
Calculate

i). The current through the 3.0Ω resistor (3 marks)

ii). The potential difference across the parallel connection. (2 marks)

iii). The current through the 4Ω resistor. (1 mark)

b) The graph below shows the variation of potential difference V with current I for a certain cell.



From the graph determine

i). The internal resistance of the cell (3 marks)

ii). The e.m.f of the cell (1 mark)

Figure 5