NAME:………………………………………………….…..INDEX NO:………………

CANDIDATE'S SIGNATURE…………………………………

DATE…………………………….

232/2
Physics
Paper II
July/August 2018

LANY ACHIEVERS 2 JOINT EXAMINATION
Kenya Certificate of Secondary Education 2018

INSTRUCTION TO CANDIDATES

- *Write your name and index number in the spaces provided above.*
- *Sign and write the date of examination in the spaces provided*
- *This paper consists of TWO sections A and B*
- *Answer ALL the questions in sections A and B in the spaces provided*
- *ALL working MUST be clearly shown in the spaces provided in this booklet*
- *None programmable silent electronic calculator and KNEC Mathematic tables may be used except where stated otherwise.*

FOR EXAMINERS USE ONLY

Section	Question	Maximum Score	Candidate's Score
A	1- 13	25	
B	14	12	
	15	10	
	16	10	
	17	10	
	18	13	
TOTAL			

This paper consists of 11 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)
Answer ALL the questions in this section in the spaces provided

1. Define a non-ohmic conductor   (1mk)

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2. State the property of light associated with formation of shadows   (1mk)

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3. State two characteristics of images formed by a plane mirror.   (2mks)

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4. The force on a conductor carrying an electric current in a magnetic field can be varied by
    changing the magnetic field strength and the magnitude of the current. Name two other factors
    that can affect the force.   (2mks)

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5. Figure 1 below shows a soft iron rod placed between two poles of a magnet
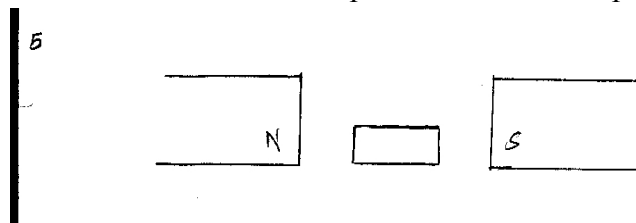
    Fig.1

    On the same figure sketch the magnetic field lines between the poles.   (2mks)

6.   (a)   Explain why an x-ray tube is evacuated.   (1mk)

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      (b)   Distinguish between 'hard and soft' x – rays   (1mk)

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7.   An electric kettle is rated 3KW, 250V. Determine the resistance of the coil.   (3mks)

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8.   **Figure 2** below shows the path of light through a transparent material placed in air.

Fig 2
Fig.2

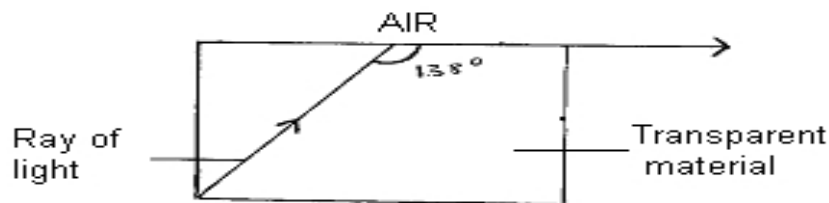**Calculate** the refractive index of the transparent material.   (3mks)

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9.   **Calculate** the wavelength of Green light whose energy is 3.37×10^{-19} J.
      $(h = 6.63 \times 10^{-34}$JS, $C = 3.0 \times 10^{8}$ m/s)   (3mks)

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10.   **State** the function of the grid in a cathode ray tube (CRT)   (1mk)

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11.   **Figure 3** below shows a laclanche cell.
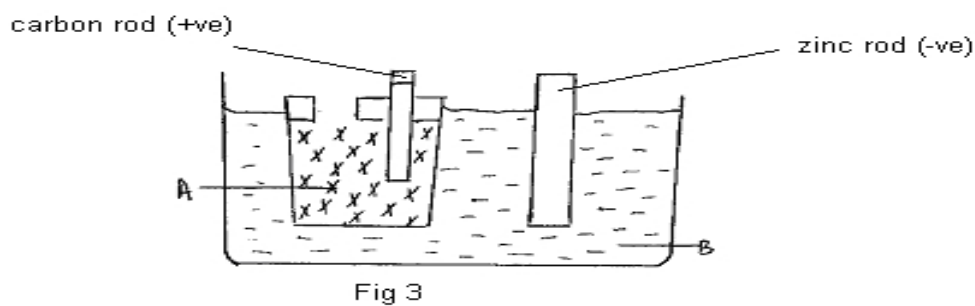
Fig 3

Fig.3

Name the chemical substances in the parts labeled.

A...

B..

(2mks)

12.   **Figure 4** below shows a highly charged needle bought near a candle flame
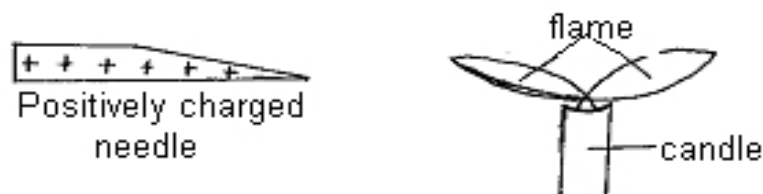
Fig.4

Explain why the flame burns in the direction shown   (2mks)

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13.   State the major difference between a dry cell and a wet cell   (1mk)

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SECTION B; (55 MARKS)

Answer ALL Questions in this section in the spaces provided

14.   (a) **Figure 5** below shows the diagram of a Geiger – Muller tube connected to a
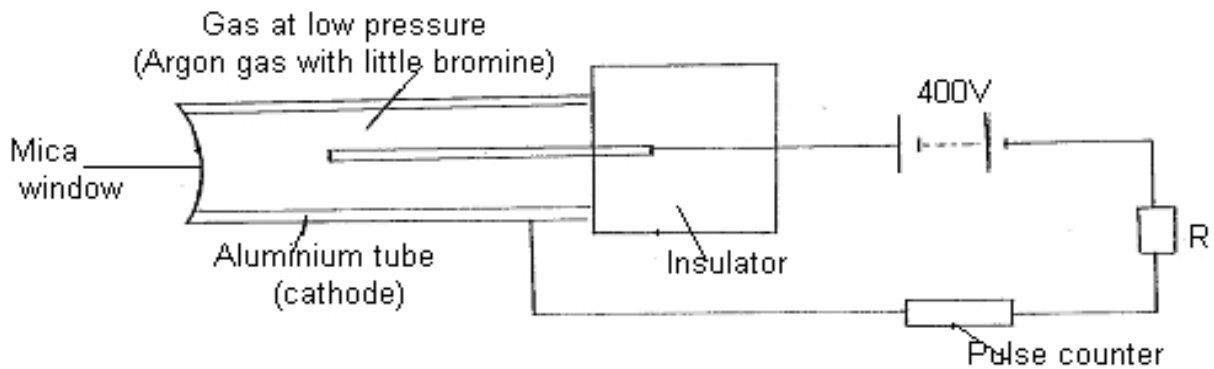   power supply and a pulse counter.

Fig. 5

       (i)   Why should the Argon gas be at low pressure?   (1mk)

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       (ii)   Briefly explain how the Geiger – Muller tube detects the radiation emitted by a
              radioactive   (4mks)

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(iii)   State the purpose of the bromine gas in the tube   (1mk)

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Suggest one way of increasing the sensitivity of the tube   (1mk)

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(v) Find the value of a and b up the following equation   (2mks)

$$^{234}_{92}U \qquad\qquad ^{a}_{b}X + 2\alpha$$

a =...

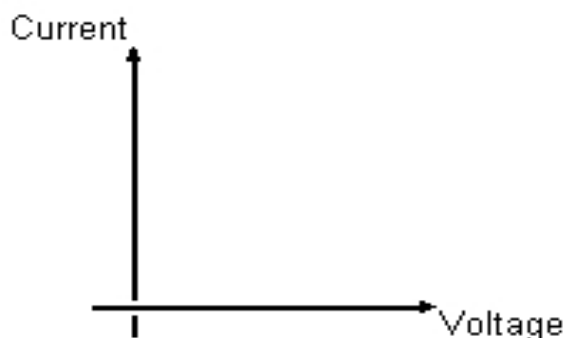b =...

(b) i) Explain how the resistance of semi-conductors and metal conductors are
affected by temperature rise.   (2mks)

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(b) ii) Sketch a forward bias characteristic of a P – N junction diode in the axis
below.   (1mk)

15.   (a)   Explain why a concave mirror is used as a shaving mirror   (1mk)

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(b)   You are provided with a metre rule, distant object, concave mirror and a white screen. Briefly describe how you can estimate the focal length of the focal length of the concave mirror.   (3mks)

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(c)   **Figure 6** below shows an object placed infront of a convex lens of focal length 10cm

Fig.6

On the same grid, construct a ray diagram to locate the position of the image. (scale 1sq rep 5cm)   (3mks)

(d)   A convex lens forms an image five times the size of the object on a screen. If the distance between the object and the screen is 120cm, determine the focal length of the lens.   (3mks)

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16.   (a)   State one cause of energy losses in a transformer and explain how it can be minimized.   (2mks)

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(b)   A transformer is designed to supply a current of 5A at a potential difference of 50V to a motor from an a.c supply of 240V. If the efficiency of the transformer is 80%.
Calculate

(I)   The power supplied to the transformer   (3mks)

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(II)   The current in the primary coil   (2mks)

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(c)   **Figure 7** shows a cross –section of a bicycle dynamo. The wheel is
        connected by an axle to a permanent cylindrical magnet and is rotated by the bicycle
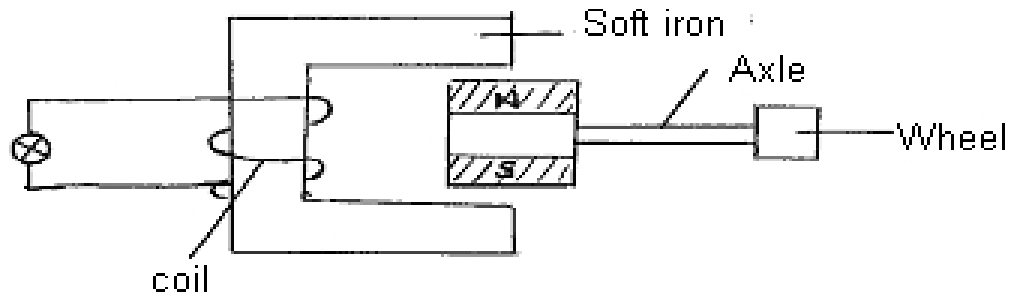   tyre.

Fig.7

(I) Explain why the bulb lights   (1mk)

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(II) How can the bulb be made brighter?   (1mk)

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17.   (a)   State two differences between sound waves and electromagnetic waves (2mks)

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(b) **Figure 8** below shows a waveform of a wave moving at velocity of 2m/s.
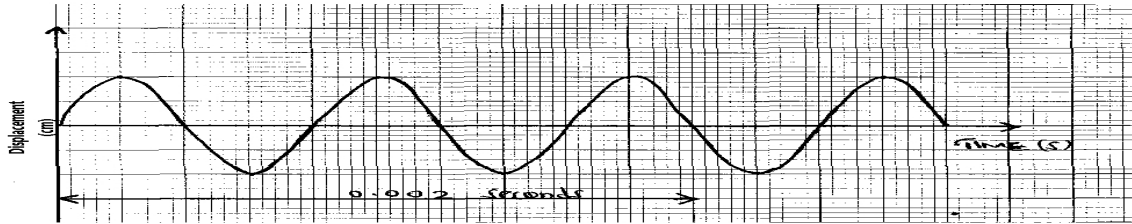
Fig.8

Determine:

(i)   The periodic time (T)   (2mks)

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(ii)   The wavelength (λ)   (3mks)

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(c)   A fathometer produces sound in a ship and receives two echo's where there is a raised sea bed one after 2.5 seconds and the other after 3.0 seconds. Find the height of the raised sea bank if the velocity of sound in water is 1460m/s.(3mks)

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18.   (a)   What do you understand by the term photoelectric effect?   (1mk)

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(b)   Name one factor that determines the velocity of photoelectrons produced on a metal surface when light shine on it.   (1mk)

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(c)   In a photoelectric effect experiment, a certain surface was illuminated with radiations of different wavelengths and the stopping potential determined for each wavelength. The table in **figure 9** below shows the results obtained.

Stopping potential ,V_s (V)	1.35	1.15	0.93	0.62	0.36
Wave length ,λ(x10^{-7}m)	3.77	4.04	4.36	4.92	5.46

Fig.9

(I)   On the grid provided plot a graph of stopping potential (Y-axis) against frequency.
                                                                                (7mks)

(II)   From your graph **determine:**

(a)   The threshold frequency   (1mk)

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(b)   The Plank's constant, h   (3mks)
(e = 1.6 x 10⁻¹⁹ Coulomb, C = 3.0 x 10⁸ m/s)

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