
KITUI WEST SUB-COUNTIES KCSE REVISION MOCK EXAMS 2015

PHYSICS PAPER 2

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NAME _____ INDEX NO. _____
SCHOOL _____ SIGNATURE _____
DATE _____

232/2
PHYSICS
PAPER 2
(THEORY)
JULY / AUGUST, 2015
TIME: 2 HOURS

KITUI WEST, MATINYANI, MUMONI & TSEIKURU SUB-COUNTIES
FORM FOUR JOINT EXAMINATION, 2015
Kenya Certificate of Secondary Education (K.C.S.E)

232/2
PHYSICS
PAPER 2
(THEORY)
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INSTRUCTIONS TO CANDIDATES

1. Write your name, school and index number in the spaces provided above.
2. Sign and write the date of the examination in the spaces provided above.
3. The paper consists of two sections, Section **A** and **B**.
4. Answer **ALL** the questions in section A and B in the spaces provided.
5. **ALL** answers and working **MUST** be clearly shown.
6. Mathematical tables and electronic calculators **may be** used.

FOR EXAMINER'S USE:

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
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A	1–11	25	
B	12	12	
	13	12	
	14	12	
	15	09	
	16	10	
TOTAL SCORE		80	

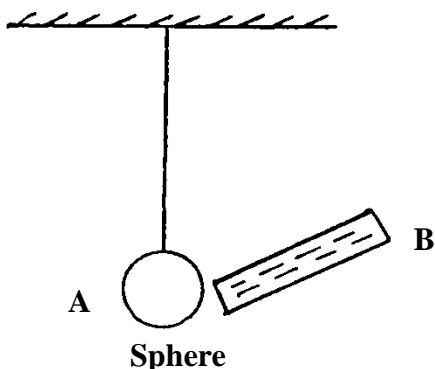
This paper consists of 12 printed pages.

Candidates should check to ensure that all pages are printed as indicated and no questions are missing.

SECTION A (25 MARKS)

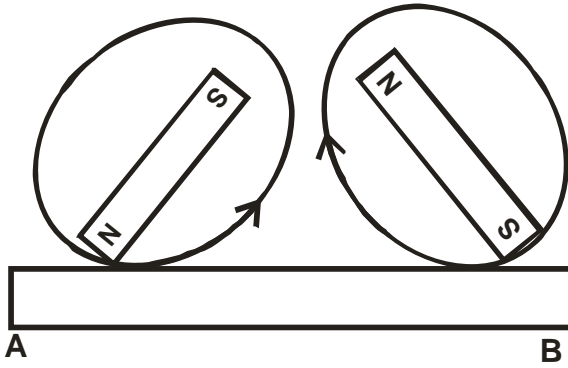
Answer ALL the questions in this section in the spaces provided.

1. The figure below shows a metallic sphere (A) suspended by a cotton thread. A negatively charged rod (B) is brought near the sphere. Explain other **three** steps for charging sphere A positive. (3 marks)



2. State **two** quantities that are used to determine whether accumulators require charging or not.(2 marks)

3. In an attempt to make a magnet, a student used the double stroke method as shown below.



State the polarities at the ends A and B

(2 marks)

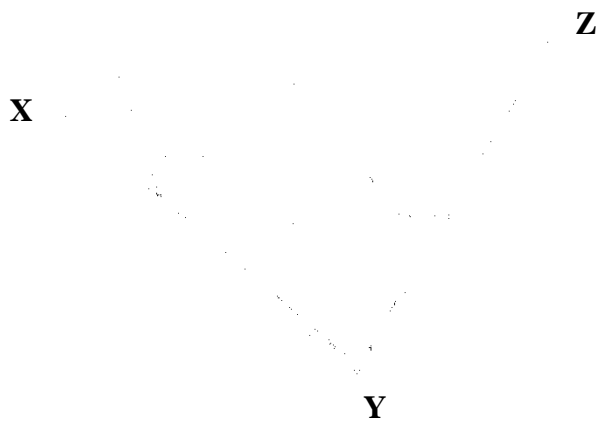
4. The figure below shows a conductor carrying current placed within the magnetic field of two magnets. Complete the diagram by showing the field pattern and the direction of force F that acts on the conductor.

(2 marks)



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5. An object 10cm high is placed 30cm in front of a concave mirror. The image is 45cm in front of the mirror. Find its magnification and size of the image. (3 marks)

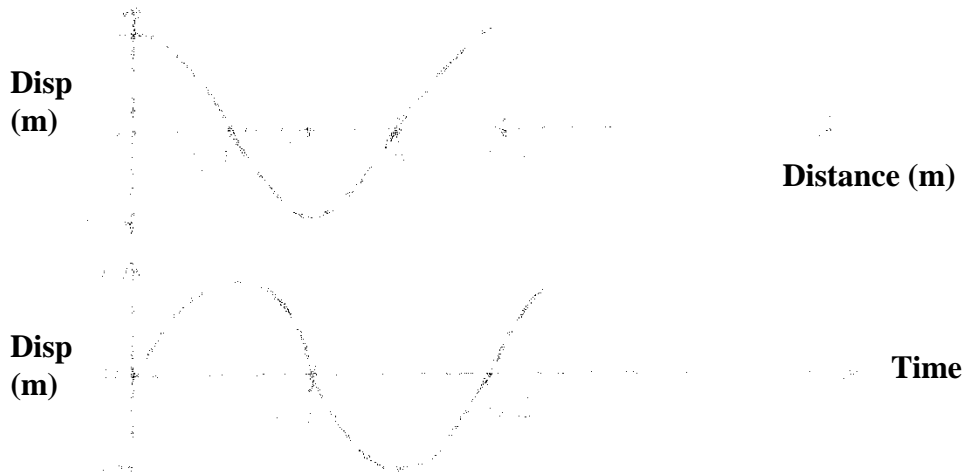
6. The figure below shows the path of a ray of light after striking two mirrors XY and YZ at an angle.



Determine the angle between the two mirrors

(2 marks)

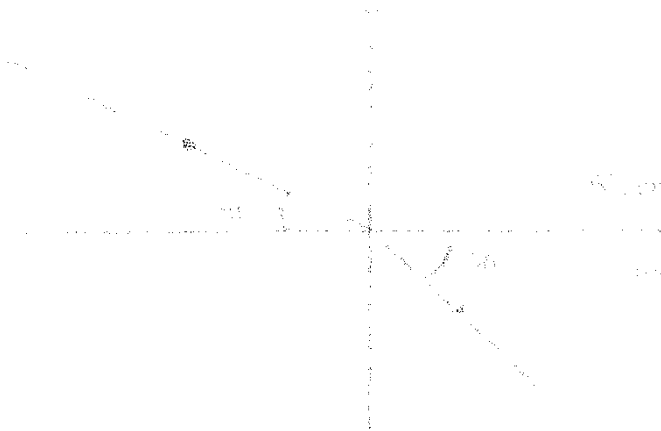
7. The graphs in the figure 4 below represent the same wave.



Determine the velocity of the wave.

(3 marks)

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8. The figure below shows a ray of light travelling through water, whose refractive index is 1.33.



Determine the refractive index of glass.

(3 marks)

9. State the type of electromagnetic spectrum emitted by warm objects.

(1 mark)

10. A candle flame is brought near the cap of a charged electroscope. State and explain the observation made on the leaf.

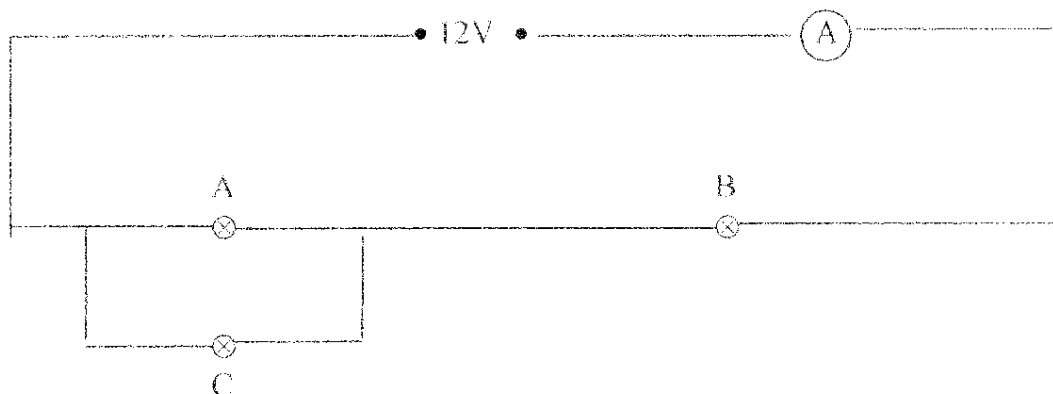
(3 marks)

11. Name **one** factor that determines the velocity of photoelectrons produced on a metal surface when light shines on it. (1 **mark**)

SECTION B (55 MARKS)

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

12. a) A student set up a circuit using three identical bulbs A,B and C each rated at 6V, 1.0A as shown below



- i) Determine the resistance of one of the bulbs when operating normally.

(1 mark)

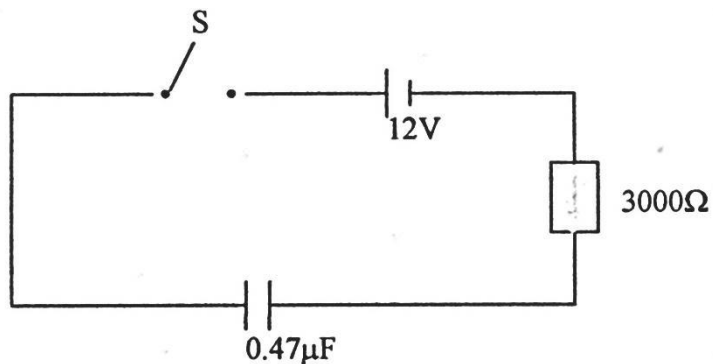
- ii) Calculate the effective resistance of the three bulbs.

(2 marks)

- iii) Draw a circuit diagram showing the three bulbs A, B and C connected in such a way that they would all light at normal brightness.

(1 mark)

b) The circuit below shows a $0.47\mu\text{F}$ capacitor which can be charged through a 3000Ω resistor when the switch is closed.



The capacitor is initially uncharged. Find:

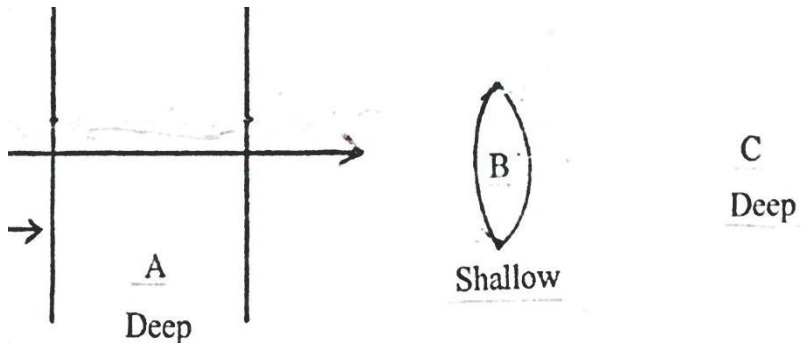
i) The initial charging current. (2 marks)

ii) The charging current after a long time. (1 mark)

iii) The maximum stored charge on the capacitor. (2 marks)

iv) The maximum energy stored on the capacitor. (3 marks)

13. The figure below shows plane waves in a ripple tank. The water is deeper in section A and C than in section B.



a) Draw the waves after passing section B. (2 marks)

b) State **two** conditions necessary for production of constructive interference. (2 marks)

c) A tube of length 36cm is closed at one end. It is at resonance with a tuning fork of frequency 256Hz sounded above the open end. Given that the velocity of sound in air is 334m/s.

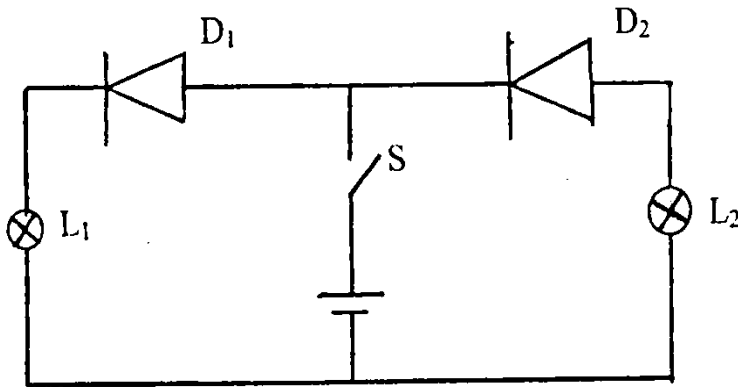
Determine:

i) The wavelength of the wave generated by the tuning fork. (2 marks)

ii) The end correction of the tube. (2 marks)

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

- ii) The diagram below is a circuit with 2 bulbs and components D.



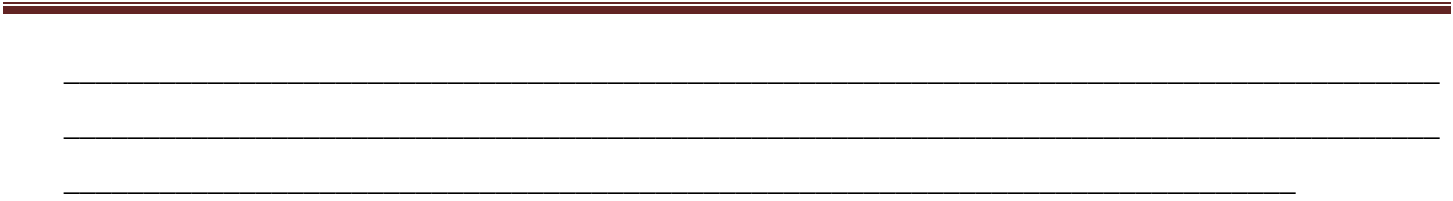
- State and explain which of the lamps L₁ and L₂ would light when the switch is closed. (2 marks)

14. a) i) Define flux leakage as used in transformers. (1 mark)

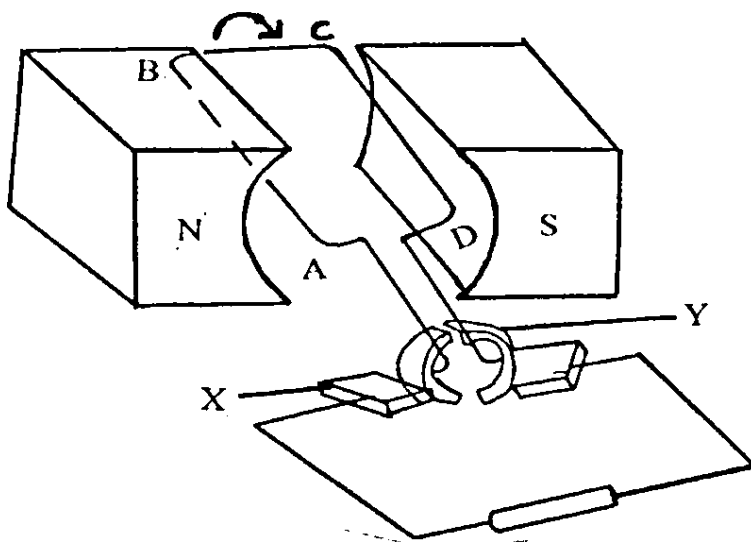
- ii) How is it minimized? (1 mark)

- b) i) In the design of a transformer in a (i) above which coil would be made with thick conductors if the transformer is a step-up. (1 mark)

- ii) Explain your answer in b(i). (1 mark)



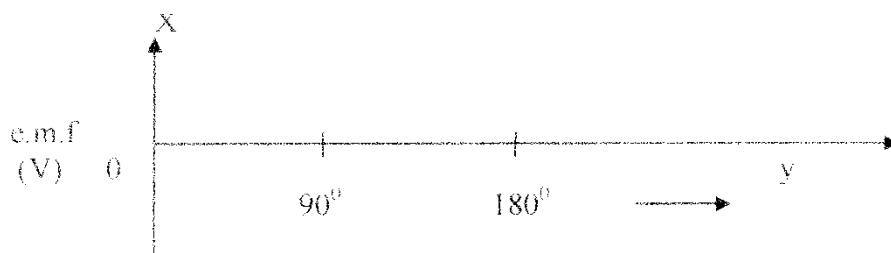
c) The diagram below shows a simple d.c generator.



i) Name the parts labelled X and Y (2 marks)

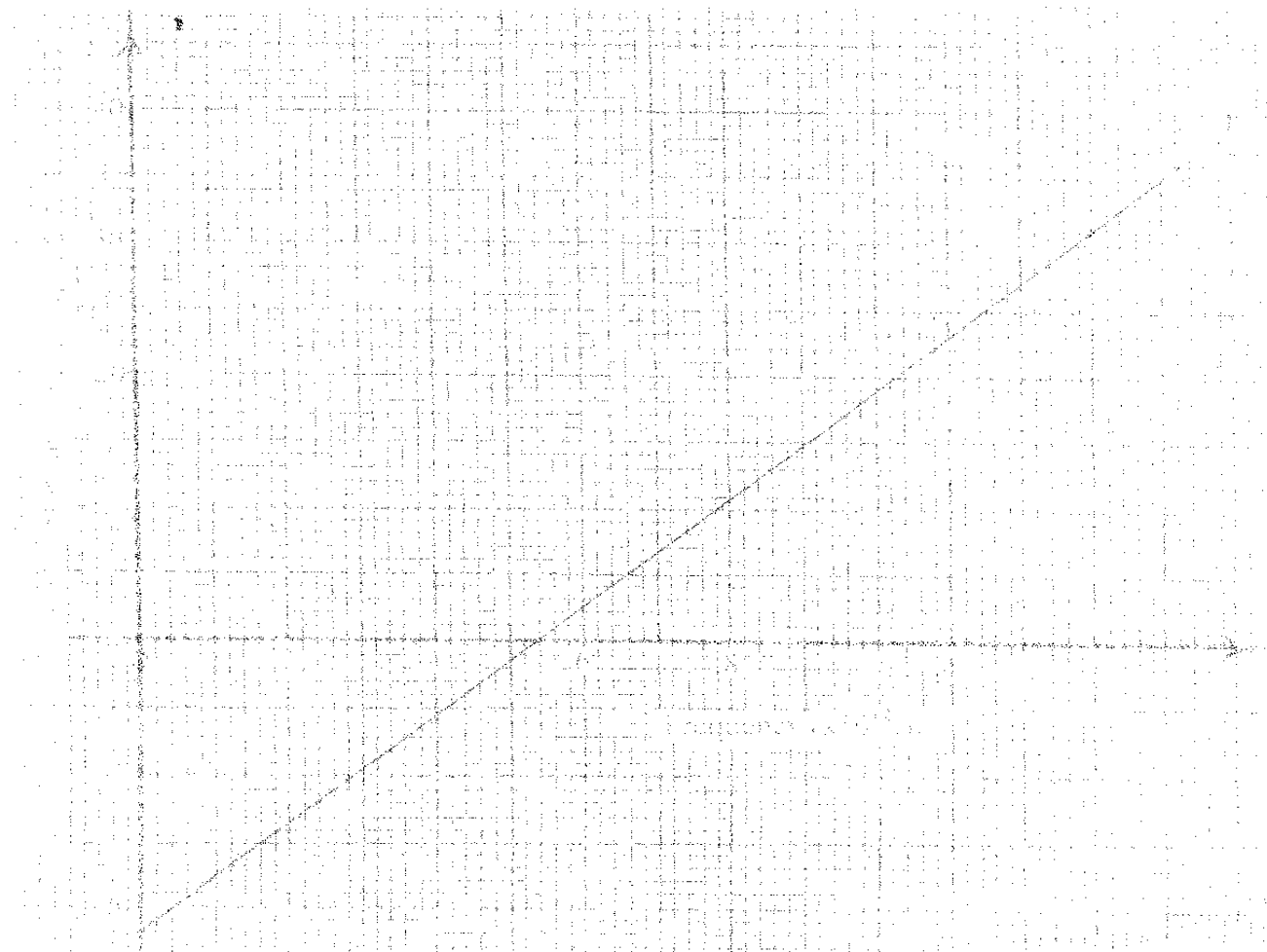
ii) The coil is rotated in a clockwise direction, indicate using an arrow on the figure the direction of the induced current as the coil passes the position shown. (1 mark)

iii) Sketch on the axis below a graph of the e.m.f generated against the angle as the coil rotates from 0° to 90° and from 90° to 180° . (2 marks)



iv) Give reasons for the changes in the e.m.f as the coil rotates from 0° to 180° . (3 marks)

15. In an experiment to find the relationship between frequency of radiation and kinetic energy of photoelectric device, the following graph was obtained.



Use the graph to answer the following questions.

a) i) Determine the threshold frequency.

(1 mark)

ii) Find the plank's constant (Take the charge of an electron to be 1.6×10^{-19} C)

(3 marks)

iii) Calculate the work function of the metal in joules.

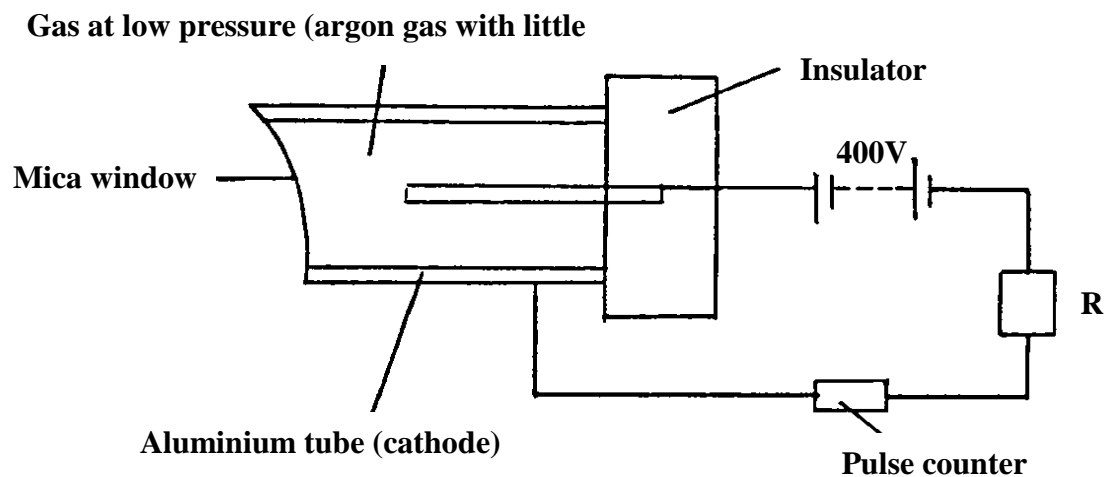
(2 marks)

b) Sodium has work function of 2.42eV. Calculate its threshold frequency.

(3 marks)

(Take the plank's constant to be 6.6×10^{-34} J)

16. a) The figure below shows the diagram of Geiger–Muller tube connected to a power supply and a pulse counter.



i) Why should the argon gas be at low pressure?

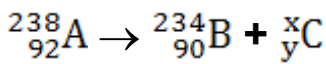
(1 mark)

ii) Briefly explain how Geiger – muller tube detects the radiation emitted by a radioactive. (4 marks)

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

iv) Suggest **one** way of increasing the sensitivity of the tube. (1 mark)

b) The expression below is an equation for a radioactive element A. Elements B and C are the daughter nuclides. A, B and C are not the actual symbols of any of the elements.



Identify the element C and state two of its characteristics.

Identity of C. (1 mark)

Characteristics. (2 marks)
