**232/2**

**NAME…………………………………………….……. INDEX NO………..…………………..**

**SIGNATURE……………………………….………………DATE……………………………..**

ASUMBI GIRLS HIGH SCHOOL

POST -MOCK 1

AUGUST/SEPTEMBER

2022

 **AUGUST / SEPTEMBER - 2022**

**PHYSICS**

**PHYSICS PAPER 2**

**TIME: 2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

* This paper consists of two sections A and B
* Answer ***ALL*** the questions in sections A and B in the spaces provided.
* All workings must be clearly shown. Mathematical tables and silent electronic calculators may be used.

Take h= 6.63 x 10-34 Js

**FOR EXAMINERS USE ONLY**

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| --- | --- | --- | --- |
| **SECTION** | **Questions** | **Maximum Score** | **Candidate’s Score** |
| **A** | **1-11** | **25** |  |
| **B** | **12** | **09** |  |
| **13** | **05** |  |
| **14** | **15** |  |
| **15** | **14** |  |
| **16** | **12** |  |
| **TOTAL SCORES** | **80** |  |

***This paper consists of 12 printed pages. Students should check the paper to ascertain that all the pages are printed as indicated.***

**SECTION A: 25 MARKS**

***Answer all questions in this section***

1. **Figure 1** shows two mirrors inclined at an angle of 30o to each other. A ray of light is incident on one mirror as shown



**Fig. 1**

 Sketch the path of the ray to show its reflection on the two mirrors (2mks)

1. **Figure 2** below shows two pith balls A and B hanging from nylon threads and brought close to negatively charged rod. Pith ball A is uncharged while B is charged.



**Fig. 2**

It is observed that both pith balls A and B are attracted to the charged rod.

1. State the charge on B (1mk)

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1. Explain the reason why pith ball A is attracted (1mk)

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1. Show the charge distribution on the pith balls (1mk)

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1. **Figure 3** shows the path of a ray of light CB passing from glass to air.



**Fig. 3**

Complete the diagram to show the path of the ray of light AB after it emerges from the glass showing the angle calculated.  (3mks)

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1. **Figure 4** shows water waves moving towards barrier.



**Fig. 4**

1. State the property of wave under investigation. (1mk)

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1. Show the emergence of the reflected wave after passing the opening (1mk)
2. State why passing of light through narrow opening is a very rare phenomenon (1mk)

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1. **Figure 5** shows an object in front of a concave mirror and its image.



 **Fig. 5**

Locate position of its principal focus and label it as F (2mks)

1. **Figure 6** shows a trace obtained from a CRO with the time base switched on.



**Fig. 6**

Draw a circuit diagram that can be used to produce the wave above (2mks)

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1. A boy opened up a used-up dry cell and found the following:

 i) The zinc casing was ‘eaten away’

 ii) The cell was watery

 Name the cell defect (1 mk)

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1. State two uses of microwaves (2mks)

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1. **Figure 7** shows a wave profile.



**Fig. 7**

Determine the frequency of the wave (3mks)

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1. Below is a nuclear reaction.



 i) Identify radiation **K**  (1mk)

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 ii) Determine the value of **X** and **Y** (1mk)

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1. **Figure 8** shows a bar of soft iron placed near a magnet.

**SOFT IRON**

N S

**Fig. 8**

On the same diagram, sketch the magnetic field pattern due to the set up (2mks)

**SECTION B. (55 MARKS)**

***Answer all questions in this section***

1. a) **Figure 9** shows an object, a screen and light sources X, Y and Z.



**Fig. 9**

1. Complete the diagram to show the formation of a shadow (2mks)
2. State one property of the object that makes it possible for its shadow to be formed

(1mk)

1. Explain why it is impossible to obtain a sharp edged shadow of the object (1mk)

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b) (i) The length of a pinhole camera is 20cm. Determine the height of a sloppy building 300m away from a pinhole camera which forms an image 2.5cm high on the screen of the camera. (3mks)

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(ii) A student decided to use a nail to make the hole of the camera mentioned above. State two possible characteristics of the image formed (2mks)

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1. **Figure 10** shows an X-ray tube.



**Fig. 10**

1. Explain the use of part labelled B and C (2mks)

B: ……………………………………………………………………………………………………...

C:………………………………………………………………………………………………………

1. Explain how the X-rays are produced. (2mks)

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1. Why is it necessary to maintain a vacuum inside the tube? (1mk) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………
2. a) What is meant by the term electromotive force of a cell? (1mk)

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b) Battery of e.m.f. 12 V supplies a current of 10 A flows through it for 5 minutes. Determine the amount of electrical energy produced. (2mks)

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c) **Figure 11** shows a graph of resistance against reciprocal of current. Use it to answer the questions that follow.



**Fig. 11**

1. Find the internal resistance, r. (2mks)

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1. Determine the e.m.f, E of the cell. (2mks)

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1. Draw a circuit diagram to show the set-up used to generate the above graph (2mks)

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1. i) Draw a circuit diagram to show how a 12V battery may be used to operate efficiently 3 headlamp bulbs each marked 6V, 24W. (2mks)

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ii) Calculate the current supplied by the battery in (d) above. (2mks)

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iii) Calculate the total effective resistance of the bulbs in (i) above. (2mks)

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1. ​a) State what is meant by the term electromagnetic induction. (1mk)

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(b) **Figure 12** shows a simple electric generator



**Fig. 12**

1. ​Name the parts labelled **X, Y and Z.**  (3mks)
X:……………………………………………………………………………………………….
Y:………………………………………………………………………………………………..

Z:…………………………………………………………………………………………………

1. Show the direction of induced current along **BC**  (1mk)
2. Sketch on the axes provided, a graph to show how the magnitude of the potential difference across R, changes with the time t for one rotation of the coil when it starts from horizontal position (1mk)



1. ​State the effect of using a magnet with curved poles as shown in the diagram (2mks)

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(c) In a transformer, the ratio of primary turns to the secondary turns is 2:20. A current of 500 mA flows through a 400 ohms resistor in the secondary circuit. Assuming that the transformer is 100% efficient, determine:

i) the secondary voltage (2mks)

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1. the primary voltage (2mk)

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1. the primary current. (2mks)

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1. I. **Figure 13** shows a graph of photoelectric current against frequency. Use it to answer questions that follow.



**Fig. 13**

1. What does the term **fo** stand for in the graph above? (2mks)

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1. Explain what the graph shows in terms of photoelectric emission. (2mks)

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1. The work function of a metal is 6.4 x 10-19 J.
2. Explain what is meant by the term work function (1mk)

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1. Light with a frequency of 1.2 x 1015 Hz is shone onto the metal surface. Find out whether or not the photons of this light will cause the photoelectric effect to take place. (3mks)

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1. The light source is now replaced with a light source which produces light with a frequency of 1.5 x 1015 Hz. The photons from this source contain more energy than is required to release electrons.
2. Determine the extra energy available after the electron has been released. (3mks)

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1. What is the extra energy calculated above converted to? (1mk)

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***END***