# Empowering Students www.freekcsepastpapers.com

**NAME:………………………………………………………ADM. NO:……………**

**SCHOOL: ……………………………………….……………………………………**

FORM THREE

PHYSICS

PAPER 2

JULY / AUGUST

2 HOURS

**Kenya Certificate of Secondary Education**

232 / 2

PHYSICS

PAPER 2

JULY / AUGUST .

2HOURS

**INSTRUCTIONS TO CANDIDATES**

* *Write your name and admission number in the spaces provided above.*
* *This paper consists of two sections, A and B.*
* *Answer* ***all*** *the questions in the spaces provided*
* *All working must be clearly shown*
* *Mathematical tables and Electronic calculators* ***may*** *be used.*

**For Examiners Use Only**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section**  | **Question** | **Maximum Score** | **Candidates’ Score** |
| A | 1 – 13 | 25 |  |
| B | 1415161718 | 13712716 |  |
| **Total Score** | 80 |  |

**SECTION A (25 MARKS)**

***Answer All the questions in this section in the space provided.***

1. You are provided with two iron bars X and Y one is magnetized and the other is not. **Explain** how you would identify the magnetized bar. (2mks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. The sketch graph below shows the relationship between the attractive force of on electromagnet and the magnetizing current. Use the domain theory to **explain** the shape of the curve as show in **fig.3** below. (2mks)



Figure 1

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. **Calculate** the critical angle for material whose refractive index is 1.4. (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. **State** and **explain** the observation made on a positively charged gold leaf electroscope when a burning candle is brought near its cap. (2mks)

**………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

1. The diagram below shows two circuits in which identical dry cells and identical bulbs are used as shown **figure.2** below.



Figure 2(a) Figure 2(b)

 **Explain** why the cells in (b) can be used for a longer period than in (a) (2mks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………....

1. An electric filament lamp used to light a room is replaced by a long fluorescent tube. **State** the effect this will have on the shadow formed by object in the room. (2mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………....................................................................................

1. **Figure. 3** below shows a displacement time graph for a wave



Figure 3

**Determine** the frequency of the wave. (3mks)

......................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

1. **Figure. 4** below shows wave front before and after passing through an opening as shown in **fig.5**



Figure 1

 **State** what would be observed on the pattern after passing the opening if

1. wave length is increased (2mk)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Gap is increased (2mk)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..........................................................................

1. Why is topping of an accumulator done with distilled water and not sulphuric acid? (1mk)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Figure 6 below shows a ray of light being incident on a mirror.



 Fig 6

 What is the angle of reflection? (1mk)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Why is a concave mirror suitable for use as a shaving mirror? (2mks)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. **Figure 7** below shows a circuit which contains a battery, a rheostat and two identical lamps. **State** and **explain** what will be observed to the brightness of the lamps if the resistance of the rheostat is increased. (1mk)

**Figure 7**

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. State ONE factor which does not change as water waves move from shallow to deep end. (1 mark)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

**SECTION B (55 Marks)**

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

1. (a) (i) State Ohm’s law (1mk)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. State factors that affect the resistance of a metallic conductor (2mks). …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(b). Two resistors of 4Ω and 2Ω in parallel are connected in series to a 3Ω resistor and a cell of 2.0V. Calculate

* + 1. Equivalent resistance of the circuit (2mks).

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

 (ii). Current through each resistor. (4 marks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………................

 (c) (i) Name the electrolyte and cathode used in the lead acid accumulator. (2mks)

...........................................................................................................................................................................................................................................................................................................

(ii) A battery is rated at 42 Ah. For how long will it work if it steadily supplies a current of 6 A (2mks) ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. (a). State two methods of charging an electroscope (2mks). ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

 (b). What is an electric field? (1mks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

 (c). State three characteristics of electric field (3mks).

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

(d) Explain why repulsion is the surest way of testing for polarity (1mk)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. a). State the motor rule. (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

 b) Sketch the resultant field pattern around the following currentcarrying conductors . (2 marks)



c). Figure below shows an electric bell.

 Push button switch



i) Describe how the electric bell works (5 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

 ii) Explain what would happen if the armature is made of steel (2 marks)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

iii) What adjustment should be done to the system to make it operate effectively with a lower voltage battery? (1 mark)

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Light passes from a prism made of flint glass of refractive index 1.89 to a second prism made of crown glass of refractive index 1.52 as shown in the diagram below.

300

Flint glass

Crown glass

Given that the angle between the interface and the incident ray is 300 ,

(a) Determine the critical angle for the pair of media. (3mks)

...................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

 (b)(i) State Snell's law. (2mk)

……………………………………………………………………………………………………………………………………………………………………………………………………

 (ii) Give **two** advantages of totally internally reflecting prisms over plane mirrors. (2mks). ………………………………………………………………………………………………...

…………………………………………………………………………………………………

1. (a) State **three** factors that affect the strength of an electromagnet. (3marks)

……………………………………………………………………………………………………………………………………………………………………………………………

(b) In **Figure 12**; the suspended metre rule is balanced by the magnet and the weight shown. The iron core is fixed to the bench.

**Figure 12**

N

**S**

**Magnet**

**Soft iron**

**Coil**

**Weight**

Bench

**String**

**Metre rule**

**S**

1. State and explain the effect on the metre rule when the switch is closed. (3marks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. State and explain the effect on the metre rule on reversing the direction of current (3mks) …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………
2. Name two advantages of an electromagnet compared to a permanent magnet (2mks). …………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………
3. State three applications of electromagnets (3mks)

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………...

1. State clock rule (2mks).

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………