535/1
PHYSICS
Paper 1
2025

2½ hours

MATIGO EXAMINATIONS BOARD

PRE MOCK EXAM 2025

PHYSICS

Paper 1
Theory

2 Hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

This paper consists of **two** *sections*; **A** *and* **B** *It has* **seven** *examination items***.**

Section **A** *has* **three** *compulsory items.*

Section **B** *has* **two** *parts;* **I** *and* **II**. *Answer* **one** *item from* **each** *part.*

Answer **five** *items in all.*

Any additional item(s) answered will not be scored.

All answers **must** *be written in the booklets provided*.

Turn Over

SECTION A

Answer **all** *the items in this section*

Item one

Learners who went for a visit to National park were amazed by the stars they saw in the dark sky at night. They had different colours and their level of brightness differed.

During day, the sky was bright and no star could be seen. They were also told that it had not rained for about two months which surprised them since their school was in a wet season.

One afternoon, three of the learners decided to go for a walk but lost their way. On calling one of the tour guides, he required them to give him an accurate location of where they were but did not know how.

Use your knowledge of Physics;

Task:

(i) Help the learners understand why the colour of the sky kept changing

(ii) To explain why the stars had varying appearance

(iii) To help the learners understand why the park they visited and their school were in different seasons

(iv) To help the learners determine their location

Item two

At a certain military camp, the officers were surprised when light from the sun started dimming. At exactly 11:34am, the sky became dark which made the military officers scared.

On communicating with their head quarters in another country, they were told the sky had been normal throughout that time. One of the officers offered to explain to them what led to the gradual darkness using a slide projector. He was however not sure if a concave or convex lens of focal length 10cm placed 40cm away from the slide would produce a magnification of 4 which would be big enough for everyone to see.

You have been approached to help the officer prepare slides to help the officers understand the strange phenomenon.

Hint: The sky became fully bright after 90 minutes.

Use your knowledge of Physics to;

(i) Explain the strange phenomenon that happened

(ii) Help the officers understand why the people at their headquarters did not see the strange phenomenon.

(iii) Help the volunteer determine if the slide projector would produce the required image.

Item three

The government of Uganda plans to set up a nuclear reactor to reduce the energy cost in the country. The following ideas were fronted by one of the members of parliament.

- All the workers at the plant were to wear safety wear.
- A detailed procedure of how radioactive materials produce electricity was to be presented.
- Assuming 1kg of radioactive material with a half life two weeks, is to be used, a clear time frame is required as to when a replacement will be required.

Hint:

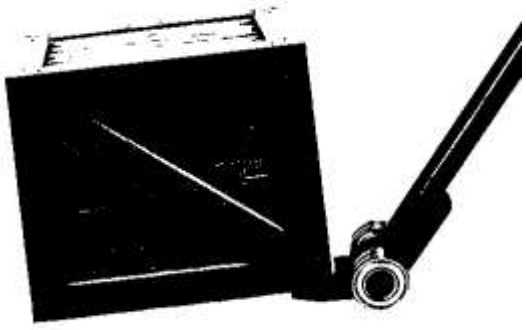
The radioactive material will only be used to produce electricity when the mass of the material is more than 50g.

Use your knowledge of Physics to help provide a suitable response to the Member of Parliament about the raised concerns.

SECTION B
Part I
Answer **one** *item from this part*

Item four

At a certain scrap yard, a metallic crow bar is used to lift heavy boxes as shown below:



The workers were surprised that lifting the box was easier when a force of 100N is applied at position A than when applied at B.

On a certain sunny day, they noticed the crow bar was very hot which made work harder for the workers. They were advised to wrap a thick woolen cloth around the crow bar to prevent their hands from being scalded.

Use your knowledge of Physics to;

(a) Explain to the workers why it was easier to lift the box when the crow bar was held at A

(b) To help the workers understand why the crow bar burnt their hands when left in the sun.

(c) Explain why wrapping the crow bar with a thick woolen cloth would ease their work.

Item five

The kitchen staff of a certain school are faced with a s of challenges;

- They need to choose between a saucepan of thickness 0.20mm and another of 0.50nm of the same specific heat capacity.
- They need to agree on whether a chimney is required on the kitchen.
- Given that a saucepan of mass 8kg is used to boil 60 litres of water at 15^{o}C to 100^{o}C. They are required to determine the cost, the amount of money that would be required to boil the water.

Hint:

Specific heat capacity of water = 4200 $Jkg^{-1}K^{-1}$.
Specific heat capacity of saucepan = 800 $JKg^{-1}K^{-1}$
Cost per 10KJ of heat provided = Ug. Shs. 500

Use your knowledge of Physics to;

(i) Help the staff choose which of the saucepans would enable faster cooking.
(ii) Help the staff understand if a chimney is required
(iii) Help the kitchen staff, determine the cost of boiling the water.

Item six

A school recently procured a commercial water purification machine that uses direct current. The electricity supplied to the school is alternating current is at 13kV with a current of 0.05A. It is changed to 240V by a process that is 80% efficient.

The learners are however puzzled if the machine will work since they don't understand how the voltage will be changed and if the machine will work.

Using your knowledge of Physics;

(a) Explain to the learners how the voltage is changed
(b) Help the learners understand how the machine that uses direct current is able to work when the current supplied is alternating current.
(c) Determine if the machine will work given that it operates efficiently when current supplied is between 2A to 3A

Item seven

A house hold with various appliances (2900 W cooker used for 3 hours daily, 10 lights of 40 W each used for 8 hours daily, and a 2900 W water heater used for 2 hours daily) is connected to a 240V appliances mains supply. The owner was discouraged from connecting the sockets of the in series by an electrician who also emphasized earthing of the same sockets. The owner also intends to spend only 70,000/= on electricity weekly.

Hint:

1 unit of electricity costs ush. 900.

Use your knowledge of Physics to;

(a) Explain why the electrician made the recommendations above.

(b) Determine if the amount budgeted for is sufficient

(c) Identify ways of reducing the electricity bill.

END

(+256780413120)