

RWENZORI REGION SESEMAT
END OF YEAR ASSESSMENT 2024

SUBJECT: PHYSICS (535/1)

CLASS: S3

TIME: 1 HOURS 30 MINUTES

2hours 30 minutes

Instructions;

- *This paper consists of two (2) sections containing seven (7) items*
- *Section A is compulsory. Answer **all** items in this section*
- *Section B has two (2) parts **I** and **II**. Answer one item from each part*
- *Any additional item(s) will not be scored*

SECTION A (This section is compulsory. Answer all the items)

Item 1

Your Aunt lives near a church that conducts night prayers. One time she observed that the praise and worship during the night was very loud compared to the normal services during day. She thought that the believers might be possessed. She decided to check in accompanied by her son who was putting on a green shirt. She was even more concerned about change in appearance of the son's shirt when being illuminated (shone on) by a bulb emitting red and yellow light

Hint:

Speed of light = $3.0 \times 10^8 \text{ms}^{-1}$, wavelength of red and yellow is $7.5 \times 10^{-7} \text{m}$ and $6.0 \times 10^{-7} \text{m}$ respectively

Task

Assist;

- (a) Your Aunt to understand why;
 - (i) The believers are not possessed as she thinks
 - (ii) The change in the appearance of the son's shirt is possible
- (b) The son with his assignment of comparing the frequencies of the light emitted by the bulb.

Item 2

Your guardian operates a business of a supermarket in a room of square dimensions (sides). He realizes he does not have enough money to install cameras. He decides to use plane mirrors instead which are cheaper. However he has a **challenge** on how to arrange them in the room. He is also **confused** by the fact that when he speaks words standing by the door way, they are repeated from the other side of the room opposite him which takes 1s.

Hint: *speed of sound in air = 320ms^{-1}*

Task

As a learner of physics,

- (a) help him with knowledge about his confusion and how to handle the challenge
- (b) Determine the dimensions of the room

Item 3

You and your friends attend to a physics lesson by a certain teacher on TV on a hot afternoon. The teacher quotes masses and radii of the earth, moon and sun that show that these bodies are very big (the sun being the largest and the moon the smallest). Your friends are therefore **surprised** that when observed from the earth;

- (i) The moon and sun appear very small
- (ii) The moon appears almost the same size as the sun

The lesson is interrupted by breaking news the continuous rains in a certain country in Europe have resulted into heavy floods. This leads to the **third surprise** that it's **dry** in Uganda and **wet** in Europe

Task:

From your knowledge of physics, help your friends to figure understand better their surprises

SECTION B**PART I (Answer one item from this part)****Item 4**

During a study tour, a student who weighs 60kg climbs up a hill of vertical height 100m and finds the rest of the people at the top of the hill. He appears very tired and sweaty. He therefore removes the sweater. The group leader appears not to understand the challenges of this student and wants the group immediately resume the journey. He labels the student as indiscipline.

Hint: *acceleration due to gravity $g=10\text{ms}^{-2}$*

Task

Assist the group leader to

- (i) Appreciate the reasons behind the actions of the student.
- (ii) Work done by the student

Item 5

A lady who works as a clinical officer leaves home in her car at 7: 00 AM intending to reach her work place at 8:00 AM 30km away from home. she sets off with a speed of 30km/hr but after travelling a distance of 10km, she was stopped by traffic police officials who delayed her for 10 minutes. When she was released, she resumed at 50km/hr non-stop until she reached the work place. Normally the boss quarreled whenever she arrived beyond 8:00 AM. At work she realized the only available thermometer, had a faded scale with the lowest reading missing completely.

Task

As a learner of physics, establish;

- a) If the boss quarreled this time around based on the time of arrival.
- b) The steps that could be followed to locate the position of the missing reading on the thermometer

PART II (Answer any one item from this part)

Item 6

In a certain town, a suitable metal rod was installed over a new building. Your neighbors suggested that it should be uninstalled and sold as scrap to recover some of the money the local government takes from them as tax. This is because they do not know the use of such an appliance. They think it's just for decoration. Your friend in the neighboring school wants to cut off part of the rod to take to school to use for making a magnet.

Task

As a student of physics assist;

- (a) Your neighbors to understand that the appliance is actually useful
- (b) Your friend to establish the;
 - (i) The most suitable material for the rod.
 - (ii) Fact that this material cannot serve the purpose of making a magnet.
 - (iii) Three common examples of materials that could help to serve the same purpose.

Item 7

A businessman in your trading centre runs a milling machine and makes chicken feeds. Recently it has been established that these feeds contain iron pieces that are not safe for consumption for the chicken. A customer who is complaining over the feeds she last bought is suggesting that the remaining feeds in the shop be thrown away and the businessman also keeps complaining about a big electricity bill.

Hint:

There are no nearby magnets. However you have been provided with copper wires, an iron nail, dry cells, connecting wires and any other relevant apparatus.

Task

Assist the businessman and the customer to understand;

- a) How to design an appliance that may help to stop further complaints from customers
- b) Practices that could minimize causes of his complaints.

END