

UG NETWORK
UCE PRE-MOCK EXAM
PHYSICS
PAPER ONE (THEORY)
TIME: 2 hours: 30 minutes

Instructions

This paper consists of two sections; A and B with 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 (5) items in all

All answers must be written in the booklets provided

SECTION A

*Answer **all** the items from this section **Item 1.***

Mr. Opolot a teacher of physics got challenges with his eyes and could not see properly, he was advised to seek medical assistance from ophthalmologist. He was given spectacles with converging lens of 20cm. while he was in class delivering strong thunder of wave length 2m roared which resulted into the breaking of his spectacles and was unable to deliver the lesson effectively that day. One of his students fixed a pencil of 10cm high at a distance of 60cm from him. Hint: Speed of sound in air is 330ms^{-1} **Task:**

As a student of physics, lead a guided discussion that helps the class to; a) Determine the;

- (i) Position
- (ii) Height
- (iii) Nature and magnification of the image that could be formed in his eyes.

(10 scores)

b) Describe the power of his spectacles for **(3scores)**

c) Find the frequency of the thunder. **(3 scores) Item 2.**

A senior two boy from a certain school was playing football with other boys, he is a very good striker and while trying to score using the head, he jumped up but unfortunately on landing, the right leg got a fracture. In trying to give him the first aid he felt a lot of pain and Headteacher invited the parents of the boy to come and pick him from the school for hospital in order to trace the broken bone. However the Headteacher promised the parents that the school shall meet all the medication charges and other related costs.

As a learner of physics help the parents to;

- (a) Differentiate and identify the medical device that the doctors shall use to trace the broken bone. (4 scores)
- (b) Describe the mode of operation of the medical device identified in (a) above. (8 scores)
- (c) Applications of the device both in industrial and medical other than tracing the broken bone. (4 scores)

Item 3.

One of the most important components of our solar system is the sun. Mathias' father was called by his son who stays in Canada at exactly 8pm. While communicating using video chat he realized Mathias was still walking in sunlight in streets of Canada. This confused the father and asked why it was like that Uganda being night and Canada still in day light. Mathias laughed and told his dad not to even get surprised and added that there are other important components of our solar system with big masses called planets. The dad got confused the more.

As a sibling to Matthias and a learner of physics, help your dad to;

- a) Know what is meant by the planet and identify all the planets found in the solar system. (6 scores)
- b) Differentiate between the smallest and largest planet in the solar system (2 scores)
- c) Identify the planet that sustains life in our solar system and greatest importance of the sun to the people. (4 scores)
- d) Realize what causes the difference between a day and night. (4 scores)

SECTION B PART 1

Answer only two items from this part Item 4.

A maize flour producer located in a certain trading centre in Eastern part of Uganda has heavily loaded his lorry truck with bags of quality maize flour. Before starting the journey that is estimated to be 1800Km and takes 3days to transport and supply maize flour to PEAS schools in the echoes cluster, the producer first checked his truck tyre pressure and temperature which was 600kPa and 15°C respectively in the morning. The producer started the journey early morning and had a stopover along a tarmac road on a hot sunny day and turned off the engine of

Turn over

the truck for some time. As the day progressed temperature in the tyre increased by three times the initial temperature and the nearby community had a blast of a bomb and they were all scared after a short time of parking by the producer.

Task

As a Physics student;

- a) Help the producer to determine his average speed for the journey in ms^{-1} .
(4scores)
- b) Support the producer to know the final temperature in kelvins and pressure of the tyre.
(5 scores)
- c) Explain to the producer why the truck tyre had to burst. (4 scores)
- d) What safety precautions should the producer have taken regarding tyre pressure and temperature before embarking on the long journey especially on a hot day? (3scores)

Item 5

Jacob a student in a certain school in Fort Portal tourism city is a class counselor who is responsible for picking books from the library to classroom. The library is a temporary structure made up of tents painted black. Jacob normally runs to reach the library because of the big distance from the classroom, one day he ran from class via main hall up to a velocity of 5m/s in 10s to reach where the library is. However after picking books he got tired and rested in the library for 20 seconds.

While in the library he felt uncomfortable and returned back to class and reached in 10s. The following lesson he ran from class via science laboratory and reached the library with a velocity of 5m/s in 5s. He picked books and also rested for 20s then he came back to class in 5s.

Task

As a student of physics,

(a) Advise Jacob the shortest route he should take so as to minimize wastage of time and explain why? (6scores)

(b) Explain to class members what could be possible reasons why the counselor felt uncomfortable while in the library. (6scores)

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(c) Advise the school the kind of structure they should put up for the school library and explain why? (4scores)

PART II

*Answer **one** item from this part **Item 6**.*

In your neighborhood two tenants A and B, living in adjacent rooms but in the same house have a conflict whenever tenant A switches on her electric stove to start cooking, the bulbs in the room of the tenant B go dim. This has brought about conflict between the two tenants. The conflict has been reported to the land lord who is finding it hard to solve the issue. The land lord has requested for your help to address the matter.

Task

As a student of physics;

Write an explanation to the landlord on the root cause of this problem. (8scores)

Using diagrams, suggest a possible solution to the problem. (8scores)

Item 7

In a certain trading centre, electricity is transmitted at 400V. A commercial farmer intends to connect 2 bulbs in a house rated 100V, 10W each and other domestic electrical appliances such that there is minimum power wastage. The commercial farmer has been advised to purchase a transformer of suitable specifications to achieve the objectives. The commercial farmer does not know what a transformer is, how it works and is bothered by the type of transformer that should be purchased.

Task

As a student of physics, help the business person to solve the problem he/she is faced with. (16scores)

END