NEXT GENERATION EXAMINATIONS @2024

PHYSICS PAPER ONE

TIME: $2\frac{1}{4}$ HOURS

INSTRUCTIONS

- Attempt any four questions only.
- You may use silent, non-programmable calculator.
- Show all your workings clearly step by step.

QUESTION ONE (12 scores)

You are to drive **300 km** to an interview. The interview is at **11:15 A.M**. You plan to drive at **100 km/h,** so you leave at **8:00 A.M**. to allow some extra time. You drive at that speed for the first **100 km**, but then construction work forces you to slow to **40 km/**h for **40 km**.

(a) What would be the least speed needed for the rest of the trip to arrive in time for the interview?

(b) And knowing how dangerous over rushing to beat the deadline can be to your life and other road users, explain how best you can overcome these dangers as you drive on your way to the interview?

QUESTION TWO (12 scores)

During heavy rainstorms, most people seek for shelter under the nearby homestead whereas others may opt for the following risky measures.

- standing on people's **verandas** for fear mostly of getting wet.
- Some people however may find themselves on the **BODABODA** and they just want to continue with their journey not knowing what risks involved:
- A few people tend to take **shelter under the tall trees**.
- Some school children even dare to continue enjoying their **football games** in open soccer fields still not worried of the risks involved.
- Some people take shelter in very tall buildings which does not have a lightening conductor.

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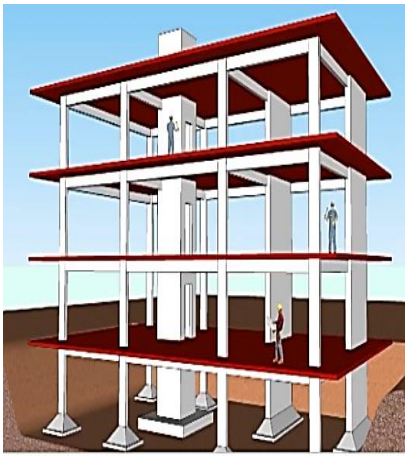
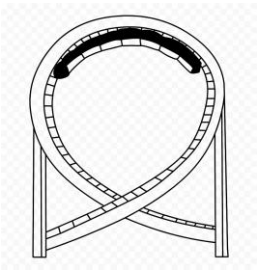
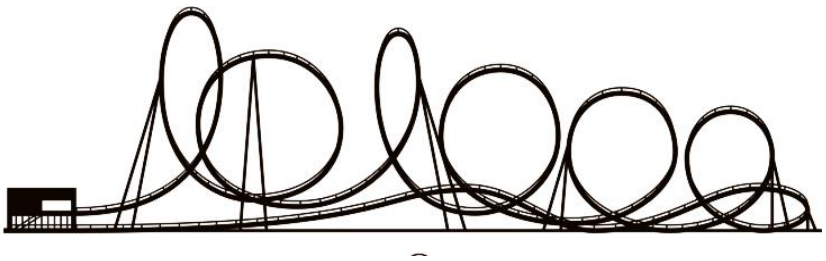



As a student of science in the science club of your school, you have been selected to present to the community meeting during the termly **community awareness** week of your school. Write a clear well explained presentation on the possible reasons why the above the above-mentioned group of people are putting their lives in danger and in each case suggest the possible preventive measures that can be undertaken to address/minimise/overcome the dangers you have stated.

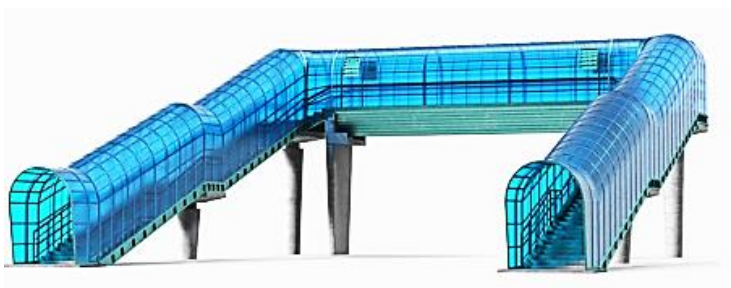
QUESTION THREE (12 scores)

A rich man in your town wants to construct a **roller coaster** fun trip **runway** for the children's festival which is to be held during Christmas season. His main problem is luck of adequate capital for the energy needs of the roller coaster trip. he does not want a design which will cost him a lot of money on energy bills.

Circular loop roller coaster runway designs

Non circular roller coaster runway designs

a) If you are the engineer and you are provided with following roller coaster runway designs, how will you be able to identify the best and most energy efficient system which can exploit (make use) of law of conservation of energy to save your boss from energy demands of the trips run by the roller coaster on the runway. Explain why you chose that design of all the runway designs provided above.
b) If the total mass of the children on the roller coaster is **150 kg** and acceleration due to gravity is **10 m/s^2**. How high above the ground should the maximum height of the roller coaster runway be built if it is required to generate a maximum of **30,000 J** of energy needed for the trip.

QUESTION FOUR (12 scores)

One of the most misunderstood branches of physics for many years has been space physics (Astronomy). Some of the examples of such misunderstandings include the following.

- The Catholic church at one time thought that other heavenly bodies, including the sun, orbited around the earth, rather than the earth.This was the problem that Catholic hierarchy had with Galileo. For example, the Church tried and arrested Galileo Galilei for supporting Sun-centred view of the universe.
- While watching the world cup which took place in Brazil in 2014 at 9pm East African time, the football fans watching the game in East Africa realised that it was still daytime in Brazil, some of them were puzzled by this?
- While it snows (winter) in most European countries in December around Christmas season, the people in East Africa have never seen any snow fall in East Africa and some of them wondered why it is this way?

How can you explain the above in case one of your classmates, siblings or friends is among those who need enlightenment about these astronomical events in order to promote deeper understanding of physics in the school and community at large.

QUESTION FIVE (12 scores)

One of your uncles wants to open a shop that deals with mirrors, and he has requested for your advice on how best he can choose the mirrors for his shop which he just plans to open. Most of the customers who buy mirrors need the following mirrors.

- ✓ Shaving mirrors and make up mirrors.
- ✓ Saloon mirrors
- ✓ Side mirrors (rear view mirrors)
- ✓ Washroom / bathroom mirrors
- ✓ Security mirrors in supermarkets and parks.

Write down an explanation of how best you can help your uncle identify and choose the mirrors wisely so that they can suit all his customer's needs.

‹‹‹‹‹‹‹THE END›››››››

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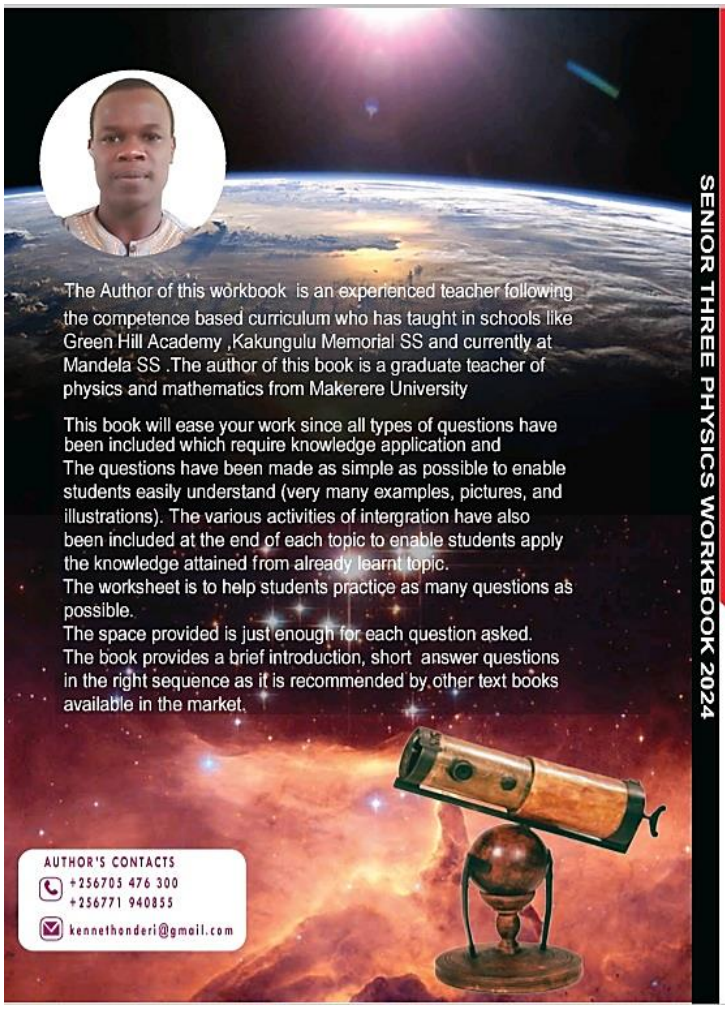
The Author of this workbook is an experienced teacher following the competence based curriculum who has taught in schools like Green Hill Academy ,Kakungulu Memorial SS and currently at Mandela SS .The author of this book is a graduate teacher of physics and mathematics from Makerere University
This book will ease your work since all types of questions have been included which require knowledge application and
The questions have been made as simple as possible to enable students easily understand (very many examples, pictures, and illustrations). The various activities of intergration have also been included at the end of each topic to enable students apply the knowledge attained from already learnt topic.
The worksheet is to help students practice as many questions as possible.
The space provided is just enough for each question asked.
The book provides a brief introduction, short answer questions in the right sequence as it is recommended by other text books available in the market.
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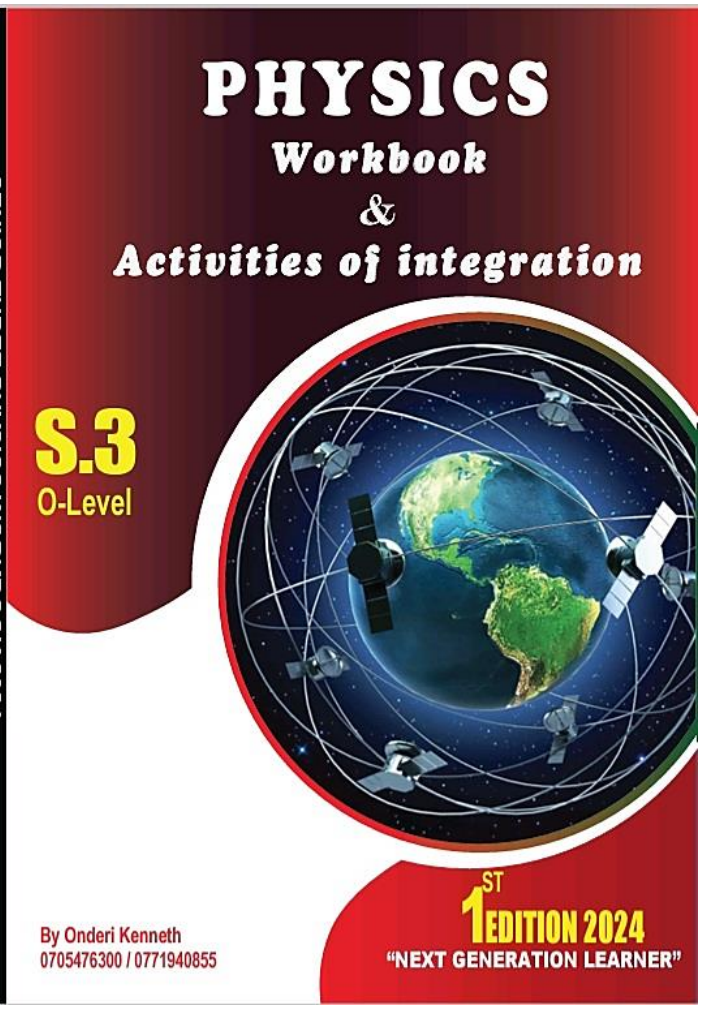
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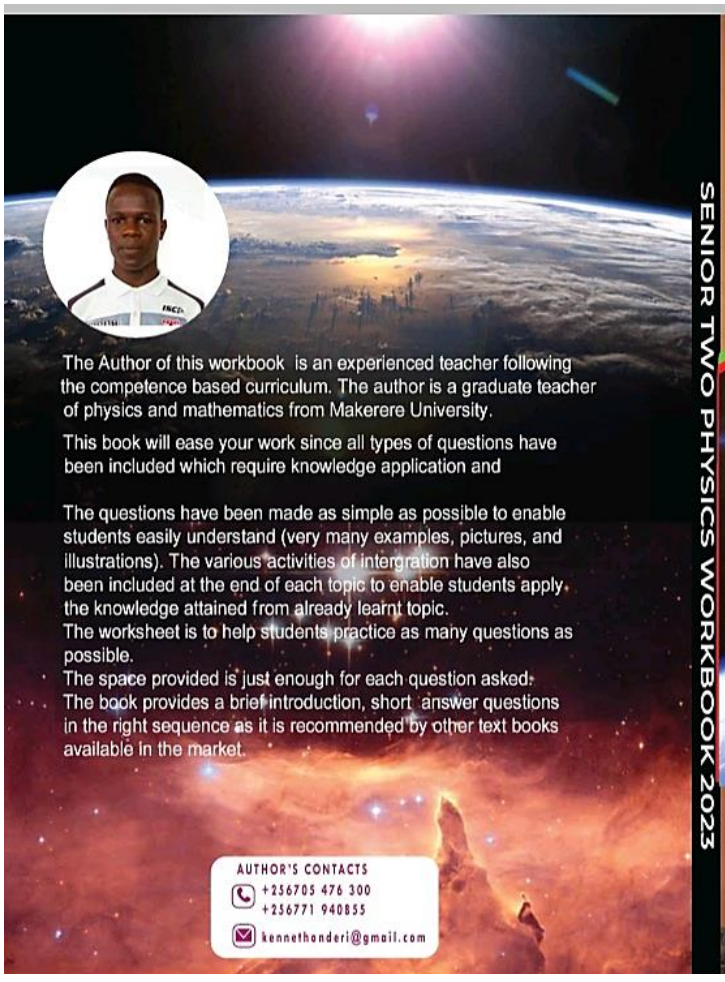
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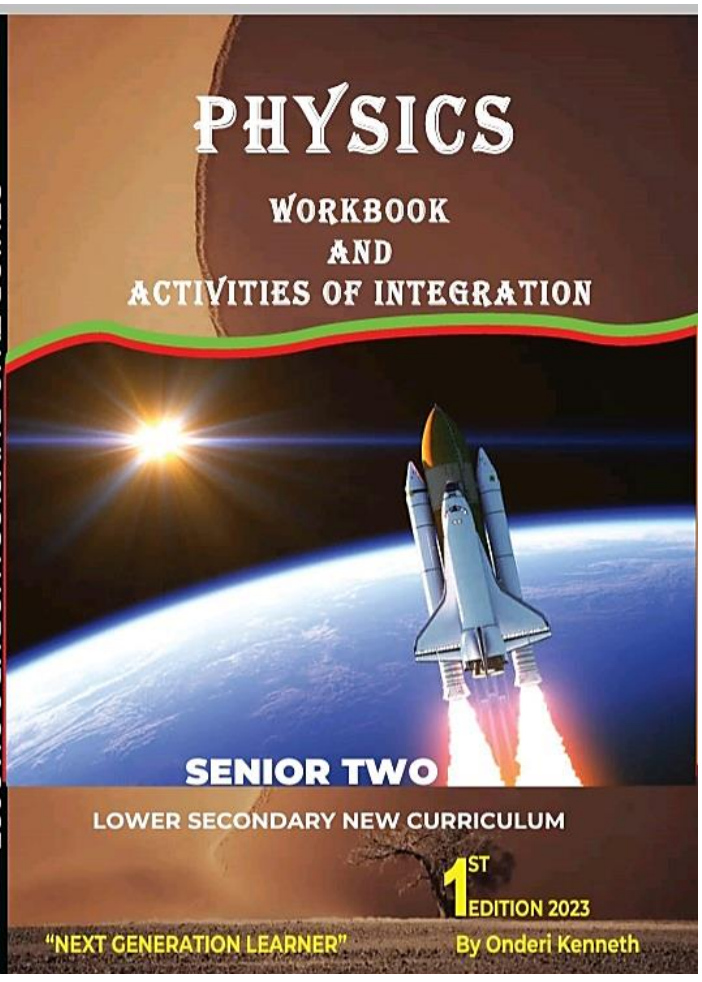
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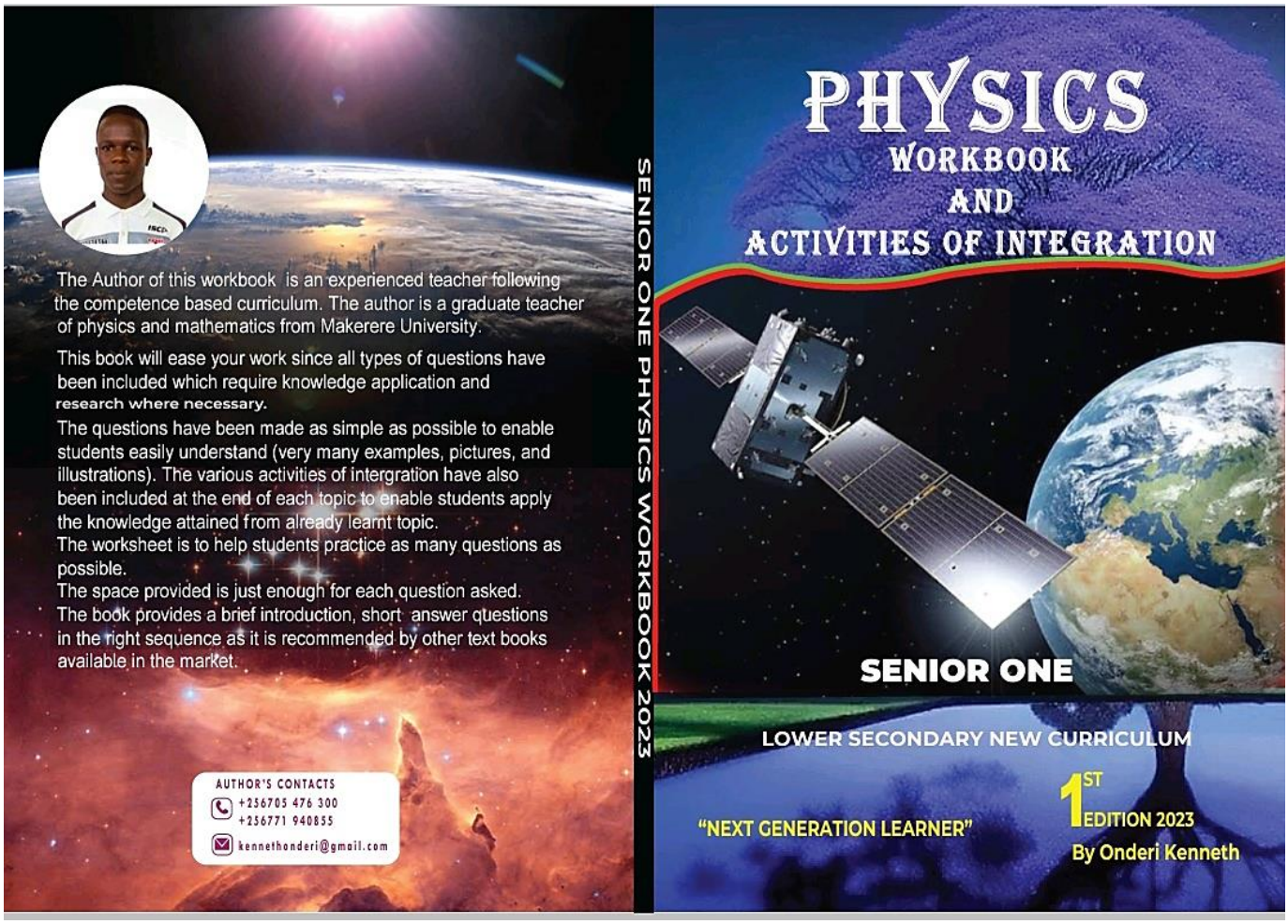

- **Get in touch with the author to get the scoring guide and implement the competency-based curriculum with ease.**
- You can also contact the author for the above TEXTBOOKS.
- BOOK FOUR is to be released this JUNE 2024
- The workbooks are meant to simplify groupwork for learners and teachers as well.
- Scenario based questions are available in the workbooks.
- Perfect illustrations are drawn in the workbooks.

- Positive criticism is well received to help improve our service delivery to the nation in terms of physics as a subject and how the books should be like in order to make the subject better.

- Get in touch with the author @ 0705476300/ 0771940855. kennthonderi@gmail.com