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MATHEMATICS

Paper 1

2024

 $2\frac{1}{4}$ hours**NEXT GENERATION EXAMINATIONS**

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

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

*Section **A** has **two** compulsory items.*

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

*Answer **four** examination items in all.*

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

***All** answers **must** be written in the Answer booklet(s) provided.*

Graph Paper is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A

Answer **all** items in this section.

Item 1

Kapere wants to make a rectangular compartment at the back of his house in order to be in contact with the existing brick wall at the exit door of his house. He aims at using this place to view the stars in the outer space using his movable telescope in the nights. He got the interest from his friend who had his plan of the layout as shown below.



If he wants to buy 60 m of fencing material to cover three sides but there are two types of Materials that cost UGX. 6,000,000 with type A given at 10% discount and type B given at a 20% discount. Kapere's objective is to construct a simple compartment with an area of 450 m² that can be enough for his telescope, his sit and even small movements.

Task.

- Basing on mathematical calculations, advise the Kapere on how to choose the length and width of this compartment.
- Find how much he is about to spend on each type of fencing material.
- Using critical analysis, help him choose the fencing type material to use for his desired place.

Item 2

Mr. Ssali works under the government and is a manager of a certain pharmaceutical industry. Of recent he comes up with an idea of owning an industry and this can happen by getting a lone. Before he does that he makes a background check on his data in way his money is taxed in order for him to establish the actual amount he can use per month to base on and get a loan. He gathers the following data from Stanbic bank; earns a gross salary of Shs. 5,000,000 per month which includes some allowances as follows. Housing allowance shs. 300,000 per month, marriage shs. 500,000 per month, medical as $\frac{1}{50}$ of the gross income and transport shs. 10,000 per day. The rest of the income is subjected to an income tax which is calculated as follows:

7.5% on the first shs. 2,000,000

12.5% on the next shs. 800,000

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20% on the next shs. 500,000

30% on the next shs. 100,000

35% on the remainder.

-Mr. Ssali brings all this information to his personal accountant at the industry to verify all this information gathered.

-The bank offers a loan at a simple interest rate of 15% per annum.

Task:

As a personal accountant to Mr. Ssali, help him to determine;

- his net income at the end of the month.
- what percentage of his income goes to tax.
- the number of years it will take him to pay a loan of 300 million.
- the interest that he pays per month.

SECTION B

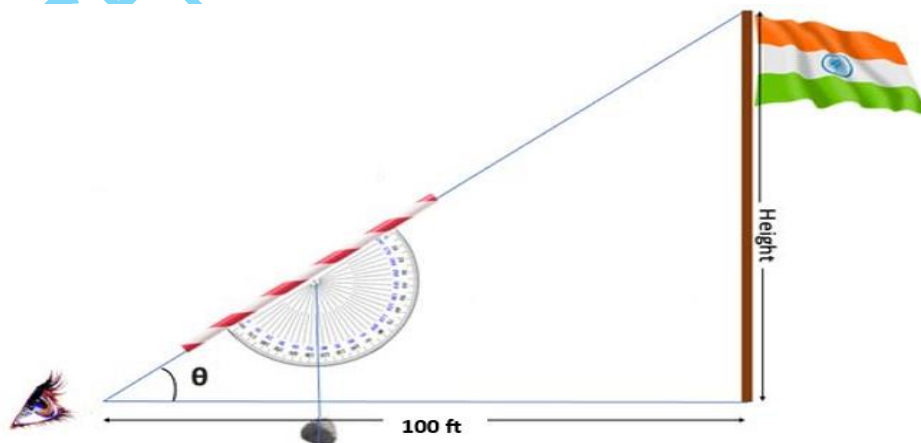
This Section has two Parts; I and II

Part I

*Answer **one** item from this part*

Item 3

Aladin uses a straw, a potractor and a string with a small bob fixed to swing at the centre of the potractor to form a clinometer. He wishes to come up with a flag mast like the one at school but doesnot know the actual height of the pole used and the pole is very long to climb. Aladin decides to stand at a perpendicular distance of 100 ft away from the flag mast. He wants to find the angle of elevation but then uses his clinometer and measures the angle on the clinometer 60° by looking at the end tip of the pole shown in the figure below.



-After doing so, he notices that the metallic flag pole was assembled using short pieces. He finds out from the nearest hardware that each piece costs UGX. 65,000 per metre.

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-Hard ware provides the pieces on weekly hirepurchase with his first deposit 30% of his total pay.

Consider 1 feet to be equivalent to 0.3 metres.

Task:

- Show how the next steps Aladin used in order to find the height of the flag mast.
- Find out how much he spent on buying the pieces he required to assemble his own flag pole.
- Find how many weeks he takes to clear the whole amount on hire purchase.

Item 4

Immediately after COVID-19 in the month of May 2022, Uganda received only 128 tourists that month that visited three game packs namely Murchison Falls (M), Kidepo Game Reserve (K) and Queen Elizabeth National Park (Q). 4 tourists remained in Kampala and visited some orphages. 6 visited M only. 10 visited K only. 8 visited M and Q only. Those who visited K and Q only were 30. 10 tourists visited all the three game parks. Those who visited parks M and K only were four times those who visited park Q only.

Task:

- Determine the number of tourists who visited Queen Elizabeth National Park.
- State the number of tourists who visited each game park.
- Find the number of tourists that visited;
 - at least one game park.
 - at most two game parks.
- If a student is picked at random from the class, determine the probability that the student attempted from at most two sections.
- Give two reasons based on calculations above on what the government should do to improve in the tourism sector.

Part II

Answer one item from this part.

Item 5

A Uganda National Road Authority is planning to construct a roundabout at mile twenty along Kampala Guru Road. The area identified should have a triangular flower garden with a base of 10 m and other two sides making an angle of 60° and 45° with the base. The vertices of the triangular garden should meet the roundabout at three different points. In order to construct a roundabout with the flower garden present and HK construction company is hired by UNRA.

Task:

- As an architect who is part of the engineering department of HK, use relevant mathematical instruments and a suitable scale to come up with the layout of the actual plan.
- Determine the area that this round about covers and hence find the area that is left un flowered.
- Determine the distance around the round-about?
- If HK construction company charges 1,000,000 per meter constructed, as an engineer help UNRA to know how much money it should prepare for the company to complete this work.

Item 6

Akiilu wishes to have a plan of how of her storage room that can be used to keep her package boxes, basing on the cross section of her neighbour's house. She does not want to have windows and wants to know the number of bricks this one side can take up before she can think of the rest of the sides.



If you are Akiilu's Engineer and the neighbour provides you with the measurements of this cross-sectional area and that each brick to be used has dimensions as 20 cm by 8 cm on a cross sectional view.

Task:

- Help Akiilu to estimate the number of bricks she will need to construct this cross section.

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- b) If each brick costs UGX. 500, find how much it will cost her.
- c) If the other side of the room is to have the same shape and Akillu wishes the room to have a length of 15 m. Sketch how the whole house will look like if the whole plan is complete.
- d) State the 3- dimensional figures that are used in the formation of this room.
- e) Help her in finding the volume of the lower part of the room that can be used for her package boxes.

END

- ✚ **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 New Curriculum and WORKBOOKS and TEXTBOOKS for both O and A level.**
- ✚ **Chemistry BOOK 1 and 2**
- ✚ **Mathematics competence-Based Scenario Practice BOOK. (June 2024)**
- ✚ **Subsidiary Mathematics Practice Book (s.5 and s.6)**

ABOUT THE AUTHOR



Agaba Ashraf, an accomplished educator with a Bachelor's degree in Physics and Mathematics, shares his expertise at Kololo Senior Secondary School. Specializing in O' and A' level Mathematics and Physics, he presents this meticulously crafted Mathematics Practice Book designed to elevate students' skills for their UACE Examinations. Aligned with the revised subsidiary Mathematics syllabus, the book includes trial revision exercises to enhance comprehension, with final answers conveniently placed at the end.

For any inquiries or additional assistance, please contact Agaba Ashraf at:

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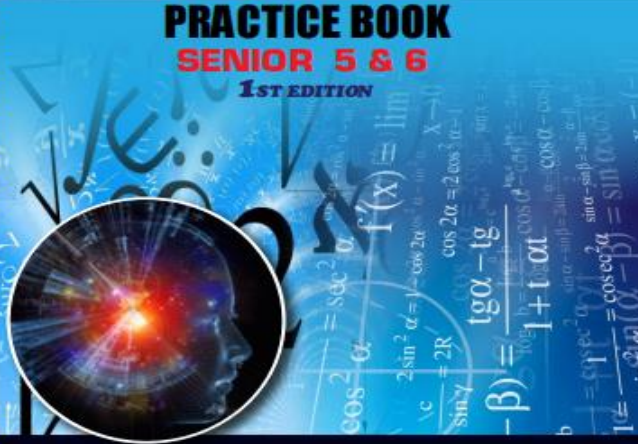
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By: Agaba Ashraf

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