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MATHEMATICS
Paper 1
July - August, 2024
2 ¼ hours

UGANDA MUSLIM TEACHERS' ASSOCIATION

UMTA JOINT MOCK EXAMINATIONS - 2024

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 should be provided*
- *Silent non-programmable scientific calculators and mathematical tables with a list of formula may be used.*

Item 1.

Understanding Numbers.

A physical education teacher is organizing a sports day event and needs to manage various aspects such as participant numbers, food supplies and equipment distribution. With the different categories available for the events, there is a challenge of ensuring that everything is allocated properly. The **200** participants registered for the event were distributed as follows: $\frac{2}{5}$ of the participants for the football tournament, **0.35** of the participants for basketball, **15%** of the participants for track races and the remaining participants for support activities. The **150** participants in the ball games are to be served each with a water bottle and a snack. Water bottles are packed in cartons, with each carton containing **12** bottles and snacks are packed in boxes, with each box containing **8** pieces of snacks. The **30** participants in track races are to be issued each with a t-shirt and **20** participants in support activities with a cap. A t-shirt uses **1.5** meters of cloth and a cap uses **0.75** meters of the same cloth. After noticing that the cloth supplier offers a "**buy 3 items, get 1 free**" deal on a mix of t-shirts and caps, the teacher decides to buy an additional **9** t-shirts and **6** caps.

Task:

(a) Distribute the number of participants in each category.

(b) Estimate the number of cartons of water bottles and boxes of snacks needed for the ball games participants.

(c) Determine the amount of cloth saved on the purchase of t-shirts and caps.

Item 2.

Patterns and Algebra

An investment club has been able to purchase **12000m²** of land for an establishment of a leisure park. The park will have a variety of relaxation points, including a swimming pool and a parking area. The swimming pool will be rectangular measuring **4m** by **3m** surrounded by a deck of uniform width. The total area of the swimming pool and the deck will be **172m²**. A space of **400m²** is to be reserved for parking. A car requires **5m²** of space and a van requires **20m²** of space. The car park attendant can handle only **50** vehicles. Each

car will be charged 4000 UGX and a van 5000 UGX. To serve visitors better, one usher is enough for atmost ten visitors and for every additional five visitors, an extra usher will be required.

Task:

(a) Compute the value of the width of the deck surrounding the pool.

(b) How many vehicles of each type should be accepted to maximise parking revenue?

(c) How many ushers are required to serve **fifty** visitors?

SECTION B

This Section has **two** *Parts;* **I** *and* **II**

Part I

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

Item 3.

Data and probability.

The director of studies, together with the team of heads of departments, is organizing the school's annual Science Fair, which features various projects presented by candidates from different classes. The projects are categorized into three main areas: Biology, Chemistry and Physics with each candidate participating in only one project. There is a challenge with the tables needed to display the candidates' projects. The tables must be able to host two projects each. There are **120** candidates participating in the science fair, with **40** candidates in Biology, **50** in Chemistry and **30** in Physics. Among the candidates, **25** like both Biology and Chemistry **15** like both Biology and Physics, **10** like both Chemistry and Physics and **5** like all three subjects. The science fair organizers plan to randomly select one project for a special award.

Task:

(a) (i) Display the number of candidates participating in each of the main areas on a suitable statistical diagram.

(ii) Estimate the total number of tables required to display all the projects.

(b) Determine the number of candidates who like only one subject.

(c) Compute the probability that the special award is given to a project from the Chemistry category.

Item 4.

The ministry of health wants to control the spread of malaria in two parishes; **X** and **Y**. However, it will first attend to parish **X** that has been most affected. Parish **X** has three villages; **A**, **B** and **C** that are most affected. The ministry has been able to secure two kinds of mosquito nets round and rectangular. At the ministry stores, the packs are picked at random. The probability of picking a pack of round mosquito net is **0.54.** The packaging is **8** and **7** round and rectangular mosquito nets respectively. The plan is to give one mosquito net for every two adults and a mosquito net for every four children. A total of **291** packs of both round and rectangular mosquito nets were dispatched to the two parishes. The statistics of the villages as of the last census is as follows:

Village	Number of adults	Number of children
A	402	329
B	256	314
C	460	410

Task:

(a) Find the total number of mosquito nets that the ministry sent to the **two** parishes.

(b) Find the total number of mosquito nets enough to cover the three villages in parish **X**.

Part II

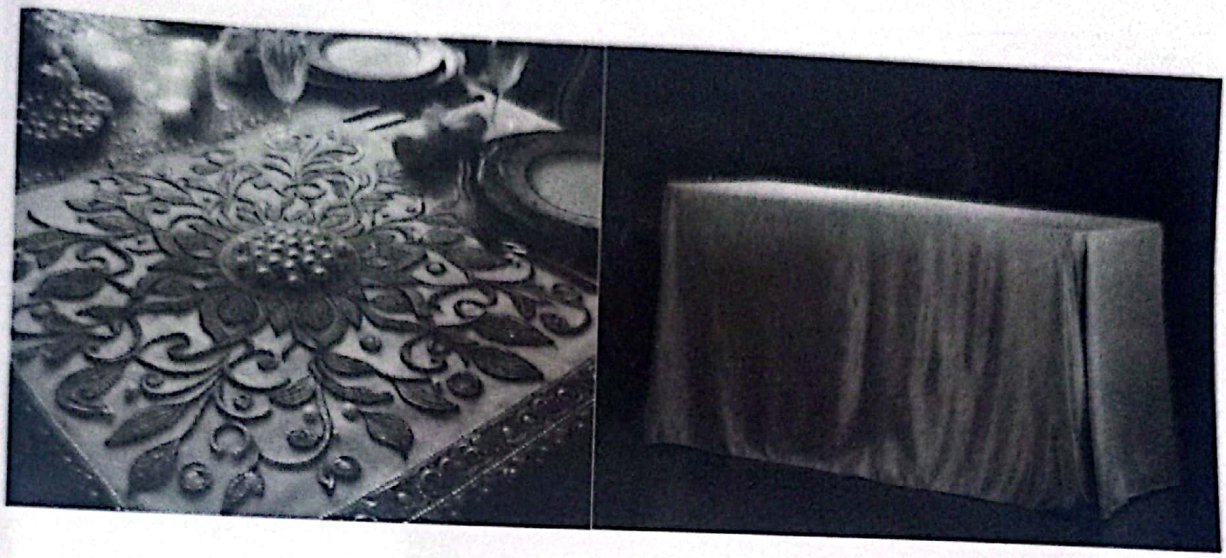
*Answer **one** item from this part*

Item 5.

Geometry and Measures

A decorator wish to cover the centre table that measures **3m** by **2m** by **5m** with a decorative cloth that covers the entire table from top to bottom. The decorator does not know the size of the cloth required to cover the table. At the store, a purchase beyond **6** square meter receives a discount of 10% on the excess of the **6** square metres purchased. The decorative cloth cost UGX 10,000 per square meter. The decorator also needs to import **2.5kg** of decorative stones to make a perfect finish for the cloth. A kilogram of the required stones

costs US $100. The required package can be shipped for US $20 to the decorator's workplace. An import tax of US $3.5 per kilogram is levied on the package. The exchange rate of US $1 is UGX 3,750.



Task:

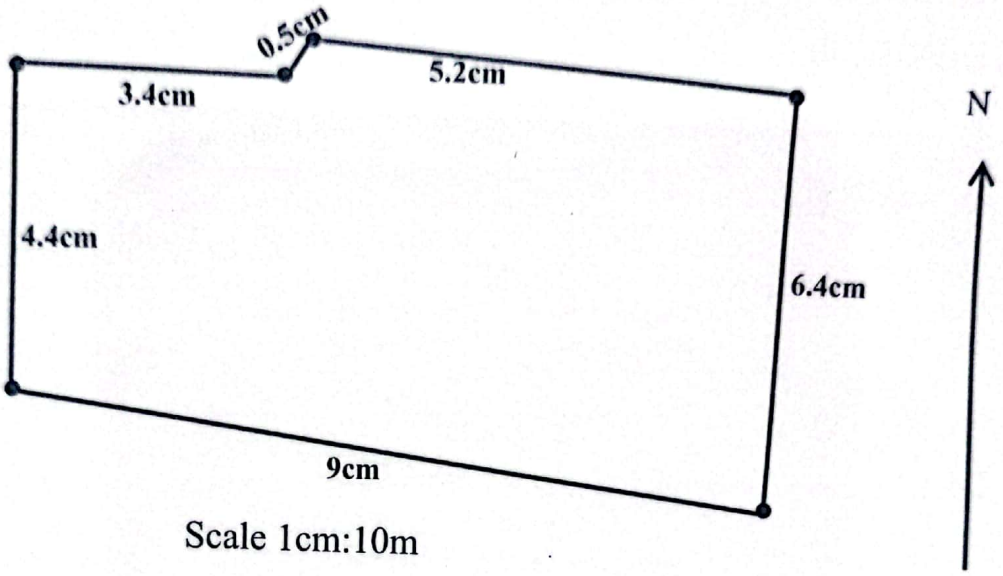
(a) Estimate the size of the cloth needed and the price at which it is sold at the store.

(b) Determine the total amount of money needed to cover all the expenses for the decorative stones.

Item 6.

The Local Council III of a certain sub-county has resolved to establish a community centre as a way of providing an avenue for social support and as a focal point for the community. The council has identified a piece of land with ready ground drawings. The idea is to have a multi-purpose hall of floor dimensions **20m** by **10m** placed in the Eastern end, a multi-purpose play-field placed in the Northern end and rest rooms (bathroom block of floor dimensions **1.2m** by **13m** and a block of toilets) in the Western end. The multi-purpose play-field ground dimensions will be to a scale of **1.8** compared to the multi-purpose hall. The block of toilets will be placed as a rotation of **45°** about one of the edges of the block of bathrooms.

Support: Diagram of reserved grounds for the community centre.



Scale 1cm:10m

Task:

(a) Make a clear accurate diagram of the support on a plane paper.

(b) Place clear diagrams on the **4** construction plans, to their accurate dimensions, on the drawn diagram.

(c) How best can the remaining open space be put to use?

END