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MATHEMATICS
Paper 1
July/August, 2024
2 ¼ hours

ACHOLI SECONDARY SCHOOLS EXAMINATIONS COMMITTEE

Uganda Certificate of Education

Joint Mock Examinations, 2024

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:

Okello, who is a retailer at Alero Trading Centre, **50km** away from Gulu City, wishes to re-stock his shop but due to the growing number of customers he receives during the business hours he does not have time to close his shop. He decided to send Akena, a tukutuku motorcycle boda, to purchase the stock from Gulu City with two million two hundred fifty thousand shillings. Akena's tukutuku motorcycle consumes **0.045** litres of fuel per kilometer. One-third of the money is to be used to buy Beer, soda and water in the ratio of **5:2:1** respectively, and **62.22%** is to be spent on groceries.

The cost of the items are as follows:

Item	Unit	Cost (Shs)
Fuel (petrol)	Litre	5,700
Beer	Crate	62,500
Soda	Carton	10,000
water	Carton	5,000

Task

(a) Help Akena to know how much fuel he needs to buy, and the amount spent.
(b) How much does he need to spend on groceries and beverages respectively?
(c) How many crates beer, cartons of soda and water does he need to buy?
(d) Determine the proportion of money he had left.

Item 2

Cynibel Supermarket in Gulu City is receiving massive clients which has resulted into critical shortage of parking spaces. As a mitigation measure, the Supermarket's management plan to construct a triangular rooftop parking design in order to compact cars, each spanning an area measuring **3m x 1.8m** to cater for the increasing demand of space. The parking lot is bounded by the following conditions; $x + y < 3$, $y - x + 3 \geq 0$ and $y + 2 \geq 0$.

The Supermarket also plans to levy a parking fee of Shs. **2,000** per vehicle and on peak days the vehicles will occupy a maximum area of **208 m²**.

Task

(a) (i) Create a graphical representation on a paper to help the management precisely understand the layout and boundaries of the new parking design.
(ii) Assist the management in identifying the accurate co-ordinates and size of the new parking design.
(iii) Will this new design accommodate the expected maximum number of vehicles? If so, determine the maximum number of vehicles that can be accommodated in the new parking area at a full capacity.
(b) Determine the Supermarket's daily highest parking revenue on a peak day.

SECTION B

Part I

*Attempt **one** item from this part*

Item 3

At a regional athletics completion held this year in Kitgum district, ASSHU Acholi Sports Committee selected a team of athletes to participate in **5000m** at the National competition from a team of **60** individuals. The selection process occurred in two phases. In phase one, participants who completed the race within **136** minutes or less qualified for phase two. Then in phase two those who finished with **122** minutes or less were selected to go and participate in the National meet, which is the ultimate goal.

The time achieved by the athletes in phase one are as follows:

Finish time (mins)	120 - 124	125 - 129	130 - 134	135 - 139	140 - 144
Number of athletes	12	10	25	8	5

Task

(a) (i) How many athletes advanced to phase two?

(ii) What is the likelihood that some of the qualifiers from phase two will go on to participate in the National completion?

(iii) Based on the probability value, what is the likelihood of the committee finding suitable athletes for the completions from the group?

(b) What is the average time of the athletes?

Item 4

A class of 156 students in S.4 class were asked to pay Shs. **5,000** each per student per subject of Chemistry, Agriculture and Entrepreneurship projects. In the end, **100** paid for Entrepreneurship, **98** paid for Chemistry and **121** paid for Agriculture. Amongst them, **63** paid for both Entrepreneurship and Chemistry, **81** paid for both Entrepreneurship and Agriculture and **85** paid for both Chemistry and Agriculture. Only one student paid solely for Entrepreneurship. Now the School need to decide whether to use Agriculture project if more than **60%** paid for Agriculture for the project scores to be submitted to UNEB.

Task

(a) Determine the number of students who paid for at least one subject and the sum of money collected from them.

(b) Determine the number of students who did not pay for any of the subjects at all.

(c) What percentage of students paid solely for Chemistry?

(d) Based on the findings, advice the school on whether to take the decision or not.

Part II

*Answer **one** item from this section*

Item 5

A group of Entrepreneurship students at Nile High School agreed to contribute equally towards starting up a school canteen worth Shs. **3,000,000.** Five students

pulled out and so the others agreed to contribute an extra Shs. **10,000** each. Their contributions enabled them to open a canteen worth Shs. **300,000** more than the originally expected.

Task

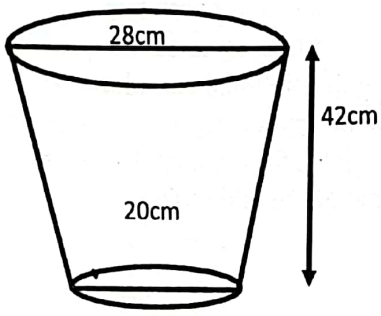
(a) If the original number of students was **x**, write an expression of how much each was to originally to contribute.

(b) Write down two expressions of how much each contributed after the five students pulled out.

(c) Determine the number of students that made the contribution and find out how much each contributed.

Item 6

A bucket is in the shape of a Frustrum with an open end of diameter **28cm** and a bottom of diameter **20cm** and it is **42cm** deep. The bucket is to be used to fill an empty cylindrical Krest tank of diameter 1.4m and height **1.2m**.



Hint;

✓ Take $\pi = \frac{22}{7}$

Three hundred sixty litres of a homogeneous paint is made by mixing three paints; Red, Yellow and Blue. The ratio of amount of Red to Yellow paint is **3:2** and that of Yellow to Blue paint is **1:2**. The cost of the paint are as follows:

Paint	Cost (Shs.) per litre
Red	1,500
Yellow	2,200
Blue	1,100

Task

(a) Determine the;

(i) capacity of the bucket in litres to **3** decimal places.

(ii) capacity of the tank in litres to **2** decimal places.

(iii) number of buckets that must be drawn to fill the tank.

(b) (i) Determine the amount of each paint in the mixture.

(ii) Estimate the amount of money needed to make one litre of the mixture.

(iii) Calculate the percentage profit made by selling the mixture at Shs. **2,000** per litre.

END.