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Mathematics
Paper 1
JULY/AUG 2024
2 ¼ HOURS

ASSHU ANKOLE JOINT MOCK EXAMINATIONS 2024

Uganda Certificate of Education

MATHEMATICS

PAPER 1

2 hours and 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 sheet(s) provided.
- Graph paper is provided.
- Silent non programmable scientific calculators may be used.

SECTION A (Compulsory)

Attempt all items in this section.

ITEM 1

A business man buys motorcycles at Ugx 4,800,000 and gives them to motorcycle riders who are supposed to give him Ugx 10,000 daily except for Sundays. After 2 years he resells these motorcycles for Ugx 2,200,000. One day this business man went to a school to seek a vacancy for his daughter who had a first grade. He found that the school fees, Admission fees and uniform fees are Ugx 810,000, Ugx 50,000 and Ugx 250,000 respectively. The school also offers 30% off school fees, free Admission and seventy-five thousand shillings off uniform for those with first grade. The school also has two payment plans and they are:

- Paying three quarters of all dues at the beginning of the term and the balance on visitation day.
- Paying three equal instalments, at the beginning of the term, on visitation day and at the end of term respectively.

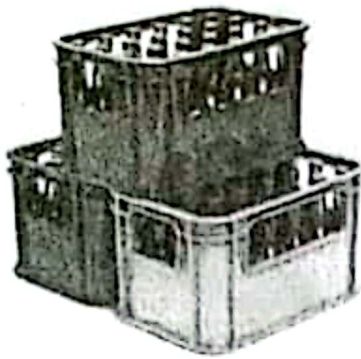
The parent plans to use his income for three months from one motorcycle to pay fees for his child.

Task.

- a) By what percentage will the price of the motorcycle have reduced after 2 years.
- b) (i) How much will the businessman pay for his daughter after getting bursary?
(ii) Will the businessman afford school expenses with his income for three months from one motorcycle.
- c) How much do those who pay school fees of Ugx 810,000 pay per instalment, according to each of the payment plans.

ITEM 2

A party organizing committee has Ugx 450,000 available to spend on buying beer and soda. At least twice as many crates of beer as crates of soda are needed. Each crate of beer contains 25 bottles and costs Ugx 40,000. Each crate of soda contains 20 bottles and costs Ugx 15,000 more than 200 bottles of beer and soda are needed.



Task

- Write mathematical statements that show the relation between beer and soda.
- Show the feasible region of the relation on a Cartesian plane.
- Help the organizing committee to determine how many crates of beer and soda that should be bought so as to minimize the cost of drinks and calculate this minimum cost.

SECTION B

Part I – attempt one item from this part.

ITEM 3

The city council in trying to plan for the city roads, decided to conduct a survey on the means of transport people use to access the city from their homes. A sample of 100 people were asked which form of transport they used. It was found out that 46 people only used bicycles, 21 people only used Taxis and 11 people only used motor bikes. 5 people used Taxis and bicycles but not motor bikes, 3 people used Taxis and motor bikes. 6 people used bicycles and motor bikes. 9 people declined to respond.

Task.

- As a mathematics student, represent the information above on a suitable diagram.
 - Help the city council to find the number of people who used all the three forms of transport.
- What is the probability that a person selected at random uses a Taxi?

ITEM 4.

A bus company wanted to know the average time it takes to move from town A to town B. They decided to record the time in minutes it took a bus to move from town A to town B. This was done for 30 consecutive days and the results are shown in the table below:

Time(minutes)	60 – 63	64 – 67	68 – 71	72 – 75	76 – 79
Frequency(f)	1	3	12	10	4

After looking at the table the manager concluded that it roughly takes 71 minutes on average to move from town A to town B.

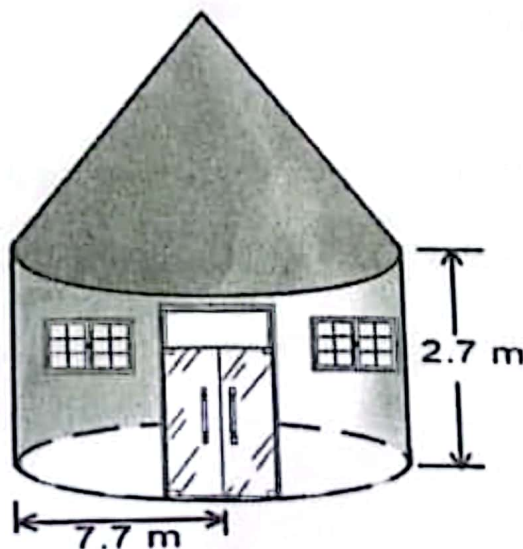
Task.

- As a mathematics student, calculate the average time it takes to move from town A to town B using the assumed mean of the manager.
- Represent the information in the table on a histogram.
- If a bus sets off from town A, what is the probability that it will take 76 – 79 minutes to reach town B?

Part II –Attempt one item from this section**ITEM 5**

A construction company builds houses with cylindrical walls and conical roofs. James hired the company to construct for him a house with a floor diameter of 7.7m and height of the walls 2.7m. He requested that his house should have 2 windows of 0.9m by 0.6m and a door of 2.1m by 0.8m.

He also plans to paint the outer wall of the house. The company advised that they use 1 litre tin paint and each tin costs Ugx 15,000. A tin can paint 5m^2

Support

Task

- Calculate the surface area of the wall to be painted.
- How many tins of paint are required to paint the wall?
- Help James to find how much money he will spend on paint.

ITEM 6

An employee of a dairy farm was promoted to a position of a farm manager and was told that his gross salary per month would be Ugx 2,400,000 and that includes an allowance of 600,000 tax free. The rest of his income is subjected to an income tax which is calculated as follows:

- 8.5% on the first Ugx 850,000
- 12.0% on the next Ugx 600,000
- 20% on the next Ugx 150,000
- 31% on the next Ugx 70,000
- 36% on the remainder.

The employee would like to understand the above terms and conditions of his new job.

Support.



Task

- Help the employee to calculate his monthly income tax.
- How much is his annual net income.
- What percentage of his gross monthly salary is his monthly income tax.

END