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MATHEMATICS
Paper 1
08th August 2025
2 Hours 15 Minutes



KAMPALA WAKISO GIANT SCHOOLS' ASSOCIATION (KWGSA)

National Joint Mock Examination 2025

Uganda Certificate of Education

MATHEMATICS

Paper 1

2 Hours 15 Minutes

INSTRUCTIONS TO CANDIDATES

*The paper has two sections **A** and **B**, it contains six items.*

*Section **B** has two parts. I and II.*

*Sections **A** has two **compulsory** items and choose **one** item in each part of section **B**. Attempt **4** items in all*

SECTION A: COMPULSORY

Item 1

Okello and James have a certain piece of work to complete. They work in hours, when Okello is working alone, takes 20 hours to complete the work, while James 30 hours when working alone. This time they are planning to join the effort and work together, each hour they are expected to be paid 50,000/=. After working they are expected to share their money in the ratio of their ages. But their ages currently are in the ratio of 4:1, after 6 years, the ratio of their ages are expected to be in the ratio 5:2. Okello wants to invest his money in a business of ice cream, but he is not sure how much he may get from the piece of work.

Tasks

Help them to:

- (a) Determine how many hours they may take to complete the work.
- (b) Determine how much they will receive from the piece of work.
- (c) Determine the share for Okello so that he can invest in the business

Item 2:

The games master of a certain school wishes to take the participants of the school for games competition in your region. They are expecting to travel by a taxi and a coasta. The capacity of the taxi is 18 and a coasta is 27.

The number of prayers to go will not exceed 108, is expecting to pay 240,000/= for each trip of a taxi and 300,000/= for each trip of a coasta. He was given 2,400,000/= for transport from administration but the number of trips made by a taxi, should not exceed those made by the coasta by more than 2. But the games master is confused about the maximum of participants to take given the available funds.

Task:

Help him to determine the maximum number of players to take given the available funds.

SECTION B

PART I

Choose one item

Item 3:

The performance of science subjects of a certain school at A level was poor per results of UACE 2024.

The school academic committee sat, chaired by the D.O.S of the school. It's found out that the school has a teaching staff of 22 teachers, out of these, 8 teach maths, 7 physics and 4 chemistry. No teacher teaches all the 3 subjects, 3 teach both maths and physics, one teaches maths and chemistry and the number of those who teach both physics and chemistry is the same as the those who teach chemistry but not physics.

In that meeting it said that if the probability of the number of teachers who teach at least two of the 3 mentioned subjects is less than half, it needs to add a teacher in the science department;

Task:

As a student of maths, help the D.O.S to address the issue with a reason.

Item 4

Sarah is expecting to have visitors in the next few minutes. She is preparing a cup of tea for each one. The cups are in a cupboard but with different colours of red, green and black. Unfortunately power has gone off but she has to pick cups from the cupboard roundly without replacement. In the cupboard there are 7 red cups, 6 green cups and 5 black cups, but she wanted to pick 3 cups one after the other, but of the same colours.

Task: What is the probability for her to pick the cups of her choice for her to serve the visitors?

PART II.

Choose one item from this section.

Item 5:

There is a misinterpretation between employees of a certain company and URA. Some employees complain that URA taxes them more than others yet they work for the same

company. Each one of the employees who complain to be over taxed earns a gross monthly income of 2,200,000/= and others who are not complaining each one earns a gross monthly of 1,000,000/=

But each employee of the company gets the following allowances.

Transport per day 3000/= feeding allowance per year 2,400,000/= medical insurance per month 60,000/= each employee pays taxes according to their earnings as shown below;

Monthly taxable income (ugsh)	Tax rate %
Blow 300,000	Tax free
300,001-500,000	5
500,001-600,000	15
Above 600,000	25

Task:

Help the employees and URA to address their issues.

Item 6

Your friend has a triangular garden which measures 15 m by 14M by 16 m, he has also a goat which he needs to tether in the middle of this garden so that it does not eat the surrounding crops near the garden. He has a cylindrical tank, where he pores water for the goat to drink. The tank is of height 4m and base radius 2m. From the borehole, he collects water using a pail which was cut off from the cone, the original height of the cone was 20cm, the base radius of the pail is 15cm and top radius 10cm. Your friend is not sure of the length of the rope, so that the goat doesn't eat the surrounding crops near the garden and the volume of water of the tank and the pail.

Task:

- (a) Help your friend to determine the maximum length of the rope in metres to buy for a goat for not to eat the surrounding crops.
- (b) How many times is he going to fetch water using a pail to fill the tank.

END