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MATHEMATICS
Paper 1
July/Aug. 2025
2 ¼ hrs

UGANDA TEACHERS' EXAMINATIONS SCHEME

Uganda Certificate of Education

JOINT MOCK EXAMINATIONS

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**.

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.

Turn over

SECTION A

Answer both items in this section.

Item 1.

Mukasa has bought 48 broilers, 60 layers and 72 local chicken to start a poultry farm. He was advised not to mix up these birds yet he wants to put an equal number of birds in different cages. Mukasa does not know the highest number of birds he can put in each cage.

He has been given a formula of mixing feeds for birds as a:b:c.

For maize brand: concentrate: broken, after expressing $\frac{3\sqrt{2}+\sqrt{3}}{\sqrt{3}-\sqrt{2}}$ in the form $a + b\sqrt{c}$ but he has failed to understand it.

When Mukasa went abroad, he sent four million one hundred twenty-five thousand Uganda shillings to his wife. He instructed her to use only 0.4848..... for family expenses and invest the balance in their poultry project.

Task:

Help;

(a) Mukasa to know the highest equal number of birds he can put in each cage without mixing them.

(b) Mukasa to understand the formula for mixing feeds using figures.

(c) Mukasa's wife to determine the amount of money to invest in the poultry project.

Item 2.

A welder has been contracted to make a rectangular window of area 2880 square inches. The client wants the length of the window to be 12 inches more than the width, but the welder has failed to decide on the dimensions of the window.

The client is impressed with the welder's work and gives him shs 1,680,000 to make doors and windows.

Each door is made at a cost of shs 240,000 and sold at shs 320,000. Each window is made at a cost of shs 140,000 and sold at shs 250,000. He intends to make atleast 6 items altogether. Since clients always ask for doors first, he decides to make more than 2 doors.

However, the welder has failed to know the number of doors and windows he can make, to maximize income.

Task:

Help the welder to determine;

(a) The dimensions of the window for his client.

(b) The number of doors and windows he can make to maximize income. Using a cartesian plane.

SECTION B

This section has **two** *parts:* **I** *and* **II.**

PART I

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

Item 3.

The academics office of your school gave a pre-registration exam to S4 class. The office has decided to register only students who got an average score or better. The students performed as follows; 4 students got 10 – 19 scores, 2 students got 20 – 29 scores, 6 students got 30 – 39 scores, 5 students got 40 – 49 scores, 8 students got 50 – 59 scores, 8 students got 60 -69 scores, 6 students got 70 – 79 scores and 3 students got 80 – 89 scores.

Turn Over

The academics office intends to give a remedial exam, if the probability of randomly picking a student who failed is more than 0.4.

The academics' office has requested for your help in decision making.

Task:

Help the academics' office to determine;

(a) The pass mark.

(b) The number of students to register.

(c) If a remedial exam is necessary.

Item 4.

The girls' schools in your district competed in football, volleyball and netball. The winner is to be determined by the points obtained from the games won. 5 points are to be awarded for each win in football, 4 points for each win in volleyball and 3 points for each win in netball.

The best four schools performed as follows;

- School A had 1 win in football, 2 wins in volleyball and 3 wins in netball.
- School B, had 2 wins in football, 3 wins in volleyball and 2 wins in netball.
- School C had 3 wins in football, 1 win in volleyball and 3 wins in netball.
- School D had 1 win in volleyball, 2 wins in football and 3 wins in netball.

The organising committee also agreed to give certificates to all the girls who participated in at least 2 games. Records show that;

187 girls played football, 228 played netball and 133 girls played volleyball. 49 girls played football and netball, 42 girls played football and volleyball while 61 girls played netball and volleyball. All the girls played at least one game. The

number of those who played netball only, is three times those who played volleyball only.

The committee needs your assistance in determining the winner by using matrices, as well as the number of girls to receive certificates.

Task:

Help the committee to determine the;

(a) Winner of the competition.

(b) Number of girls to receive certificates.

PART II

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

Item 5.

The city authority has received the money to set up a referral hospital which should be in equal distance from three health centres.

The authority also wants to construct a circular flyover connecting the three health centres. They also plan to plant a forest in the region between the direct road connecting the first health centre to the third health centre, and the small portion of the flyover connecting the first and the third health centre.

These centres are positioned in such a way that;

The second health centre is in the direction of $N40^0E$ from the first health centre, 6km away.

The third health centre is on a bearing of 100^0 from the first health centre at a direct distance of 7km away.

The city authority needs your assistance in drawing the accurate physical plan locating, the health centres, the referral hospital as well as the area for the forest.

Turn Over

Task:

(a) Construct an accurate plan, that is needed by the authority.

(b) Calculate the area to be occupied by the forest.

ITEM 6.

Kato deals in metal fabrication. He has been contacted to make a pyramidal tank with a 6ft by 8ft base. Each of the slanting edges to be 13ft long. However, Kato does not know the capacity of this tank. The materials for this tank costs shs 900,000. Kato does not have this money, however, he can borrow it at an interest of 10%. A finished tank will be sold at shs 1,840,000.

Kato also gets another opportunity of a job paying a gross salary of shs 1,000,000 which includes a non taxable allowance of shs 150,000. The rest of the income is subjected to the following tax bands.

Taxable income (shs)	Rate (%)
0 – 200,000	Free
200,0001 – 500,000	10
Above 500,000	20

Kato cannot take up both opportunities because they all expire in one month. He therefore, finds it hard to decide on which opportunity to take up.

Task:

(a) Help Kato to know the capacity of the tank.

(b) Basing on calculations, advise Kato on the best opportunity to take up.

E N D