WAKISO – KAMPALA TEACHERS' ASSOCIATION (WAKATA)

WAKATA PRE-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 is provided.

Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

Turn Over

SECTION A

Answer all items in this section.

Item 1.

(a) A certain member of your family rewrote each digit of his 4-digit visa card pin from number system 10 (base 10) to another number system less than 4. He did this in fear of theft. Now he is sick in the hospital he can neither talk nor write but the money on his account is needed to finance hospital bills. Here is how he wrote the pin 12 20 22 10. Assuming that you have been to encrypt the visa pin for the family and fans are available to care of him.

Task:

    (i)   Which number system do you think he used to rewrite the pin and why?

    (ii)   Use the identified number system to help your family numbers to regenerate the original pin.

(b) In mathematics contest of 2023, a student pressed a number in a calculator and got 3.3737... as his answer and then rounded off his answer to 3.37 which made him loss the final mark because the answer was not. He was advised to always express such answers in fraction form.

Task:

By clearly showing the steps, help the student to express the number in fraction.

Item 2.

In a certain o' level school, the students were distributed in three colour houses, Yellow, Green and Blue as follows:

Senior One, 65 in yellow, 55 in green and 60 in blue
Senior two, 70 in yellow, 60 in green and 55 in blue
Senior three, 50 in blue, 80 in yellow and 62 in green
Senior four, 65 in green, 68 in yellow and 57 in blue

Task:

(a)

    (i)   Write down a 4x3 matrix to show this information

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(ii)   Each student had to contribute some money for the running of colour affairs as shown in the table below.

Class	Contribution
S1	2000
S2	2500
S3	3000
S4	4000

Write this as a 1 x 4 matrix.
(b)   By matrix multiplication, calculate how much money each colour collected.
(c)   If 45.6% of the senior four contributions is for their farewell party, and this is only as a quarter of what the party takes, how much more do they need to raise from elsewhere?

SECTION B

This Section has two Parts; I and II

Part I

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

Item 3.

Due to poor performance in S.4 class, the class teacher was requested by the academic committee to do an analysis to be presented to the board of governors of the school given the following results.

Marks	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89
No. of students	18	34	58	42	24	10	6	8

Task:

Your class teacher has requested you to help her to analyze the data with clear explanation by:-
(a)   Finding the mean and modal mark.
(b)   Displaying the students marks on a cumulative frequency curve and use it to estimate the; -
    (i)   median
    (ii)   number of students who passed if the pass mark was 50.

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Item 4.

The geography department of your school is organizing a study tour of S.4 class. Basing on last year's complains due to poor feeding. The department has decided to interview students of this year to find out the number of students that would like to eat Matooke (M), Posho (P) or Rice (R). They came up with the following: 19 liked matooke, 24 liked posho. 25 liked Rice, 3 liked matooke and Rice only, 2 liked posho and Rice only. None of the students like matooke and posho only, 4 students dislike all the foods

Task:

Draw a plan to help the geography department to prepare meals for all the 55 students and use your plan to find how many consumed all the three food types.

Part II

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

Item 5.

A certain island has been having a serious problem of poor network for a long period of time. The government with the network providers are planning to establish a mast with a frequency that can cover the whole highland. The highland is in the shape of the triangle ABC with AB = 10km as the main landing site. Side BC = 8km and AC = 6km.

Task:

(a)   By scale drawing, help the government to come up with an accurate drawing of the island.

  (i)   Find the angle ABC

  (ii)   Given that the mast must be established where two perpendicular bi – sectors meet, establish with point M, where the mast must be and find its perpendicular distance from the main landing site.

  (iii)   It is known that the frequency must cover the highland, draw the locus of the frequency and measure its radius.

(b)   Two points P and Q are 1000metres apart. The angle of elevation of the top of the mast from points P and Q are 60^0 and 30^0 respectively. Calculate the height of the mast if;

  (i)   The points are on the same side of the mast

(ii)   The points are on the opposite side of the mast

Item 6.

Due to land wrangles in the community. an old lady was advised to hire a land surveyor in order to measure her land and fence it to avoid intruders. The land is a rectangular and after measurement the surveyor discovered that the length is a rectangular area of the land is 10 feet longer than its width and the overall area is 240 square feet.

Task:
Help her know the dimensions of the land for proper planning while fencing.

END