REV. JABULONI ISSOKE MEMORIAL COLLEGE
CHURCH OF UGANDA, DIOCESE OF KITGUM
P O BOX 187, KITGUM – UGANDA
"In God We Trust and Serve"
Mob: 0394837362, Email: jabuloniissoke@gmail.com

UGANDA CERTIFICATE OF LOWER SECONDARY EDUCATION

March, 2024

Mathematics

Duration: 2 hours

Candidate's name…… Stream…....Sign……

Instruction to candidates

- This paper consists of two sections **A** and **B**.
- Section **A** has **ten (10)** questions and are all compulsory.
- Section **B** has **six (6)** questions and attempt any **Four (4)** questions from this section. Untidy work may lead to loss of marks.
- Silent non-programmable scientific calculators may be used.

SECTION A (40 Scores)

1.a). For every book sold, a sales man gets 5% commission. If on a good day, he sells 45 books and each is Shs. 30,000. Find the commission earned by the sales person on that day.

……
……
……
……
……

(2 scores)

b). Which fraction can be obtained from 0.56444.....

……
……
……
……
……

(3 scores)

2. A straight road from Kitgum hilltop to Christ the King parish passes through the point $A(1,2)$ and $B(-2,-1)$. As a road contractor engineer, determine the steepness and the equation to describe the road.

……
……
……
……
……

(4 scores)

3. The sets P and Q are such that $n(P) = n(P^I nQ) = 7, n(Q^I) = 8\ and\ n(\varepsilon) = 20$. Represent the given information on a Venn diagram.

……
……
……
……
……

(4 scores)

4. Given that $h(x) = \frac{8}{x} - 5$, determine the expression for $h^{-1}(x)$ hence evaluate $h^{-1}(-3)$.

……
……
……
……
……

(4 scores)

5. Mr. Savanic spends $\frac{1}{4}$ of his salary on school fees .He spends $\frac{2}{3}$ of the remainder on food and a fifth of what is left on transport. He saves the balance. In a certain month, he saved Shs. 3,400. What was his salary?

……
……
……
……
……

(4 scores)

6. Make Q the subject of the formula if $P = \sqrt{\frac{X - RQ^3}{R + Q^3}}$.

……
……
……

……
……

(4 scores)

7. Given the matrix $A = \begin{pmatrix} 3 & 2 \\ 4 & 5 \end{pmatrix}$, Calculate A^{-I}.

……
……
……
……
……

(4 scores)

8. Cinderella went to the bookshop and bought 2 books and 4 pencils at $UGX.800$ and after realizing that her sister Mary also need the same items,she went back to the bookshop and bought one book and three pencils and spent $UGX.350$ less than the first spending. Determine the cost at which she bought a book and a pencil.

……
……
……
……
…… ……...

(4 scores)

9. Factorize completely $x^4 - 625$.

……
……
……
……
……..

(4 scores)

10. The mean age of a group of 6 members of the parliamentary accounts committee which consist of four shadow Cabinet ministers, a chairman and a secretary is 50. Four Cabinet ministers have a mean age of 48. If the secretary is 4 years younger than the chairman, how old is the parliamentary accounts committee secretary?

……
……
……

……
……

(4 scores)

SECTION B (60 Scores)

11.a). Given that $g(x) = ax^2 + 5x - 3 \; and \; g(1) = 9$. Find the value of;

i) a ii) $g(-2)$

(6 scores)

b). Given the function $f(x) = \frac{1-2x}{5}$ and $g(x) = \frac{x+3}{2}$. Determine the value of x for which $gf(x) = \frac{1}{10}(8x^2 + 24x + 9)$.

(9 scores)

12.a)Solve for m in the equation $\frac{2m-5}{5} - \frac{m-4}{3} \leq \frac{m+14}{30}$

b).A businessman wants to stock two types of vehicles $P \; and \; Q$ in his bond. The cost of type P is $Ugx\ 20$ million each and that of type Q is $Ugx\ 100$ million each. Vehicles P requires packing space of $20m^2$ and Q requires packing space of $30m^2$ .The number of vehicles type Q should not exceed that of type P .The businessman has at least $Ugx\ 800$ million to invest and available space of $600m^2$ .If x and y represent the number of vehicles of type P and Q respectively,

i)Write down **five** inequalities from the given information.

ii)Represent the five inequalities on the same axes.

iii)Find the greatest number of vehicles of both types $P \; and \; Q$ that the investor can buy using the minimum amount of money. (15 scores)

13.In a $x - y \; plane$,plot the points $A(-2,-4), B(-2,1) \; and \; C(-5,1)$.

a). Join the points and name the shape formed.

b). The points were later reflected in the line $x - y = 0$ to give image $A^I B^I C^I$. The image $A^I B^I C^I$ is then transformed by a translation $\binom{4}{3}$ to form $A^{II} B^{II} C^{II}$ and $A^{II} B^{II} C^{II}$ is further mapped to $A^{III} B^{III} C^{III}$ through a positive quarter turn under a rotation about $(0,3)$.Determine the coordinates of the images $A^I B^I C^I, A^{II} B^{II} C^{II}$ and $A^{III} B^{III} C^{III}$. (15 scores)

14a). What is a matrix?

b) .Pattern for army parade at Kitgum DFI on the independence day celebration where in the order two rows by two columns for the two different parade teams $A \; and \; B$ each.Determine the total number of soldiers in the parade.

c). Given that $A = \begin{pmatrix} 2 & 3 \\ 1 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & -3 \\ -1 & 2 \end{pmatrix}$.

Find i) AB

ii) $BA + A$

iii). $\det(B)(A - B)$ (15 scores)

15. At a graduation party where 105 people were invited, there are three types of drinks available; beer, soda and water. The number of people taking beer only is equal to the number of people taking water.7 likes sodas only,18 likes soda and beer,32 likes beer and water and 15 likes water and soda.30 people altogether likes soda.

a). Represent the above information on a Venn diagram and use it to find the people who took:

i) Beer only,

ii) Beer and soda but not water,

iii)Exactly two types of drinks.

b). Given that a member is chosen at random, find the probability that a member only takes one type of drinks. (15 scores)

16. A friend to your guardian wants to bring his child to the same school you attend. He calls your guardian and requests her to direct him to your school. There are two routes you can use from home to school;

Route A: A straight direct marram road from home to school

Route B:From home, drive in the direction of 135 degrees for $55km$ and then makes a bearing 180 degrees turn and drive more $40km$ you will find Kalagi trading Centre .From Kalagi you will further drive in the western direction until you reach the school. The home is vertically located above the school premises. The friend requests your guardian to send him a drawing instead summarizing his direction but she assigns you to draw.

Task

a). Assist her to make the drawing showing the road map to school.

b). If after the drawing a friend rather decides to take the southern direction from home. Through what distance will he drive to reach the school?

c).If he starts driving at $12:30pm$ and arrives at $2:30pm$ through route B non-stop. What shall be his average speed?

d). Which option of the two routes should he take and why? (15 scores)

********THE END********

Hard work pays