

456/2  
MATHEMATICS  
PAPER 2  
 $2\frac{1}{2}$  Hours

MBOGO HIGH SCHOOL  
MOCK SET 1 2022  
UGANDA CERTIFICATE OF EDUCATION  
MATHEMATICS  
PAPER 2

INSTRUCTIONS TO CANDIDATES:

- Attempt all questions in sections A and only FIVE questions in section B
- Simple, silent Non programmable calculators may be used
- All necessary working must be shown on the same sheet of paper as the rest of the answer

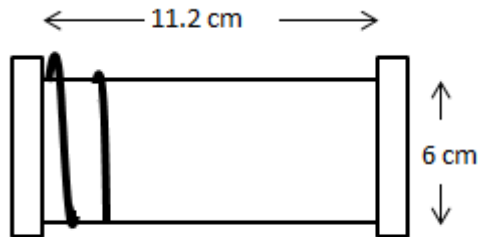
**SECTION A: 40 (MARKS)**

**Attempt all questions in this section**

1. Simplify  $\frac{12\frac{1}{2} + 3\frac{1}{5} - 2\frac{1}{4}}{4\frac{1}{4}}$  (4marks)
2. Express  $3624_{seven}$  into base five (4marks)
3. Express 0.3888 ... .. as a fraction in its simplest form. (4marks)
4. Three boys John, Michael and Tom share shs 4000. Given that Tom gets as six times as much as Micheal and John half of what Tom gets. Find how much each boy gets. (4marks)
5. A and B are two sets of objects such that;  $n(A) = 10$  ,  $n(B) = 7$  ,  $n(A \cup B) = 13$  and  $n(A \cap B) = 2$ . Find
  - (i)  $n(\epsilon)$ , the universal set
  - (ii)  $n(A \cap B)$ . (4marks)
6. Express 1000 as a product of its prime factors. Hence find the cube root of 1000. (4marks)

7. What number when halved gives  $\frac{2}{3}$  of 198 (4marks)

8. A cord (diameter 0.8 cm) is to be wound around a spool, which measures 11.2 cm across and has a diameter of 6 cm as shown. Determine the number of turns of cord, that when placed side by side, would fill the spool. (4marks)



9. When Namuwaya was 18 years old, Kisakye was 43 years. If Kisakye is now twice as old as Namuwaya. How old is Namuwaya. (4marks)

10. Find the range of integral values of  $x$  for  $9 < 3(x + 2) < 33$ , give your answer in the form  $a \leq x \leq b$  (4marks)

### SECTION B: (60 MARKS)

**Attempt only five questions in this section**

11. (a) Given two sets **A** and **B** such that  $n(A) = 12$ ,  $n(B) = 13$ ,  $n(A \cup B) = 20$  and  $n(\varepsilon) = 24$ , find. (i)  $n(A \cap B)^I$

(ii)  $n(A \cup B^I)$  Where  $\varepsilon$  is the universal set,  $B^I$  represents the complement set of B. (6marks)

(b) In a survey, 100 people were asked which of the two beverages they preferred, Tea Or Coffee. Twelve said they liked both and 40 said they liked Tea but not Coffee.

How many liked Coffee but not Tea? (6marks)

12. Bank of Uganda sells foreign exchange as follows;

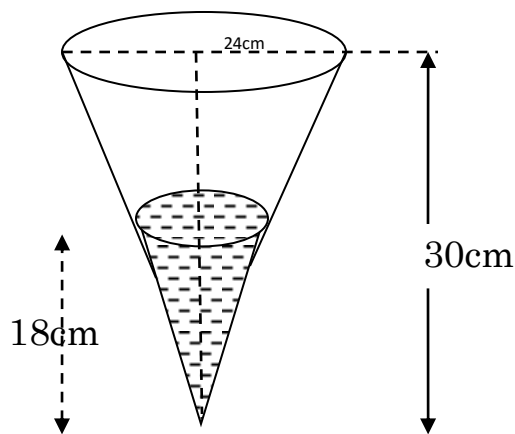
1 British pound sterling (£) = Ushs 1750

1 USA dollar (\$) = Ushs 1200

(a) How many British pounds sterling does a business man get from his 20 USA dollars

(b) In 2001 a Yamaha stereo unit was sold for UGX 800 which represents a loss of 14% on the original price paid. What was the original price paid? (12marks)

13. The diagram below shows a right cone shaped flask of base radius 24cm and depth of 30cm contain water at a depth of 18cm.



Calculate;

(i) The radius of the surface of the water.

(ii) Volume of the water

(iii) Volume of the whole cone

(12marks)

14. The S4 2022 at Mbogo High School planted a variety of crops on their respective plots at the school farm. After harvesting the sales were as shown in the table below.

Crops	Quantity harvested	Cost (Shs)
Cucumber	80 Kg	1,500 Per Kg
Beans	200 Kg	2,000 Per Kg
French beans	50 Kg	2,,300 Per Kg
Beet root	100 Kg	4,000 Per Kg
Maize	20 Kg	500 Per Kg
Cabbage	400 heads	1,000 per head

- (a) Calculate the total amount of money obtained from the sales.  
 (b) If Shs 800,000/= was spent seeds and pesticides, how much profit was made.  
 (c) The 250 students shared the profits equally. How much did each student get?

15. (a) The position vector  $p$  of a point  $P$  is  $\begin{pmatrix} 3 \\ 6 \end{pmatrix}$  and the position vector  $q$  of a point  $Q$  is  $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$ . Find;

- vector  $PQ$
- the position vector of midpoint  $M$  of  $PQ$

(b) Given that  $A(3,4)$ ,  $B(-,1,2)$  and  $C(-1,-1)$ . If  $ABCD$  is a parallelogram, find the coordinates of  $D$  (12 marks)

16. (a) Given that  $h(x) = \frac{1}{1-x^2}$

- Find;
- $h(2)$
  - the values of  $x$  for which  $f(x)$  is undefined.
- (6 marks)

(b) If  $g(x) = 4 - x^2$  and  $h(x) = 2x + 1$ . Find;

- $hg(x)$
  - $hg(4)$
- (6 marks)

17. (a) Given that  $y$  is inversely proportional to the square of  $x$  and that  $x = 2$  when  $y = 1.5$ . Find the value of  $y$  when  $x = 3$  (6 marks)

(b) Six boys, three girls and father shared shs. 360,000 in the ratio of 4:5:3 respectively. Find how much each girl got. (6 marks)

END