456
MATHEMATICS

BASTON COLLEGE

$2^{1/2}$ HRS

UGANDA CERTIFICATE OF EDUCATION
END OF TERM I 2023
SENIOR FOUR
MATHEMATICS

2HOURS 30 MINUTES

INSTRUCTIONS

- Answer all questions in section 'A' and any four from section 'B'
- All necessary calculations must be shown clearly.
- Graph papers are provided.
- Silent non programmable calculators may be used

SECTION 'A' (*40MARKS*)

Qn1 (i) simplify $(7 -3\sqrt{2})\ (7 +3\sqrt{2})$

(ii) $(3^3)^0 +(3^{-4}x3^6) +\left[\frac{1}{3}\right]^{-2}$

(4 MARKS)

Qn2. Without using tables os calculator evaluate;

$Log_2^{1/2} +3log_2^2 – log_2^4$

(4MARKS)

Qn3. factorize completely

$2X^2-98$

(4MARKS)

Qn4 the goals scored by some players in torment are summarized below.

Goals	1	2	3	4	5
No. of players (f)	2	a	3	2	1

Fi the mean number of goal is 2.8 determine

(i) Volume of a.

(ii) Number of players who scored the goals

(4MARKS)

Qn5. Work out: $4652_{eight} - 637_{eight}$

QN6. Given that A= $\begin{bmatrix} 5 & 4 \\ 2 & 3 \end{bmatrix}$ Determine the inverse of A^2.

Qn7. Given that $F(x)=5x^2 - 4$

Find (i) f(-1)
(ii)$f^{-1}(x)$. (4MARKS)

Qn8. Given that
$3t5_{eight} = 245_{ten}$
Find the value of t (4MARKS)

Qn9. The value of a machine depreciates at a rate of 5% per annum.
If the value of the machine now is 3.61 million. What was the value of the machine 2 years ago?

(4MARKS)

Qn10 simplify: $\frac{3-2\frac{3}{4}}{1\frac{3}{4}}$ (4MARKS)

SECTION B (60 MARKS)

Qn11. out of 35 farmers in Jinja 13 grow sugar cane (s)

20 grow coffee (c)

17 grow Bananas (B).

9 grow both sugar cane and Bananas

3 grow both sugar cane and coffee

2 grow all the three crops.

Those who grow coffee and Bananas but not sugar cane is 8.

a) Represent this information on a given diagram.

b) Find the number of farmers who grow;

(i) Only coffee

(ii) At least two crops.

c) Which crop had to be grown with at least other crops. (12 MARKS)

Qn12. The vertices of parallelogram are A (3,-2) B(4,-2) C (5,-1)

D (4,-1). It has been given a transformation to form;

A^1 (-6,4) B^1(-8,4) C^1(-10,2) D^1(-8,2).

a) Describe the transformation that Maps ABCD onto A'B'C'D'

b) Describe the transformation that would map A'B'C'D' back onto ABCD

(12MARKS)

Qn13. Tom's gross monthly salary is sh. 1,200,000. The following are the allowances.

Medical: Sh: 600,000 per annum

Marriage: $1/5^{th}$ of the gross monthly salary

Un married: Sh: 200,000 per month.

Family allowances for only one child using the following rates.

A child below 10 years sh: 100,000

A child above 10 years sh: 150,000

Tom is married with two sons. One aged 7 years and the other 12 years.

The monthly income taxi is calculated as follows.

TAXABLE INCOME (SHS)	RATE
01 – 300,000	20
300,001 – 500,000	25
500,0001 – 900,000	130
900,001 and above	40

Calculate Tom's monthly .

i) Taxable income.
ii) Income tax.
iii) Net income.

Qn12. Below are marks scored in a test by students.

Marks	10-19	20-29	30-39	40-49
No. of students	11	10	14	7

50 - 59	60 - 69	70 - 79
6	4	4

a) Using 44.5 as an assumed mean calculate the mean.
b) Draw a histogram and use it to estimate the mode (12MARKS)

Qn14. a) Given that:

$$\begin{pmatrix} -1 & 3 \\ -1 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 5 \\ 8 \end{pmatrix}$$

Find the value of x and y (4MARKS)

i) A school welfare master bought 10 kg of Rice and 5kg of meat at sh. 90,000.
If he decrease each of the above by 2kg his expenditure would have also decrease by sh. 28,000

ii) Find cost of a kilogram of Rice and meat.

iii) How much would the welfare master pay for 30kg of Rice and 5kg of meat
(8MARKS)

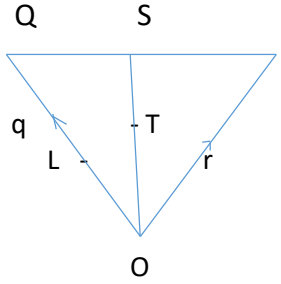
Qn15. a) solve for x and y

$X^2 - xy = 24$

$X - y = 8$ (4MARKS)

b. Mary is 3 years older than her brother.
In two years time the product of their ages will be 238.
Find Mary's present age

Qn16. In the diagram below OR =r,OQ =q. S divides OR in the ratio 1:2 T divides line OS in the ratio 3:2.



a) Express the following items of q and r.

i) RQ (ii) OS (iii) RT

b) If L is the mid point of OQ
Show that R,T and L are collection hence find the ratio.
RT: TL

(12 MARKS)

********** END **********