

ALLIANCE COLLEGE BUSIA

***Uganda Advanced Certificate of Education***

END OF YEAR EXAMINATIONS 2023

S.5 MATHEMATICS

PAPER 1

3 HOURS

**INSTRUCTIONS**

* *Answer all the eight questions in section* ***A*** *and only 5 questions from section* ***B***
* *Any additional question(s) answered will not be marked.*
* *All working must be shown clearly*
* *Begin each answer on a fresh sheet of paper.*
* *Silent, non-programmable scientific calculators and mathematical tables with a list of formulae may be used.*

**SECTION A (40 MARKS)**

Attempt all questions in this section

Each question carries 5 marks only.

1. Show that logx8 = logx4. Hence without using tables or calculator,

Evaluate log68, correct to 3 dp of log34 =0.7925. (5 marks)

2. solve simultaneously

X(5-x)=2y (5 marks)

3. Show that if the expressions x2+6x +c and x2+px +2 hence

A common factor then (c-p)2=(6-p)(cp-6q). (5 marks)

4. The tenth term of an AP is 29 and the fifteenth term is 44. Find

The value of the common difference and first term. Hence find the sum

Of the first 60 terms. (5 marks)

5. Using small changes, find to 4 SF. (5 marks)

6. solve Cos(θ+350) = sin (θ+250) for 00≤θ≤3600. (5 marks)

7. Evaluate sin2x cos xdx. (5 marks)

8. Find the equation of the tangent and normal to the curve

Y=4x3-6x2+3x at point (1,1). (5 marks)

**SECTION B (60 MARKS)**

Answer only five questions in section. Each question carries 12 marks only.

9. Sketch the curve given by y= (12 marks)

10. a) solve the inequality (6 marks)

b) by reducing to echelon form, solve for x, y and z

x+y+z=0

x+2y+2z=2

2x +y +3z=4 (6marks)

11 a) The acute angles A and B are such that CosA= and sin B=. Show, without using a calculator, that tan(A+B)= .an

b)i)express 4 in form R where R is constant and an acute

angle.

ii) Determine the maximum value of the expression and the value of for which it occurs. (12 marks)

12. a)Given that y=etan x show that –(2 tan x +sec2x) . (6 marks)

b) Differentiate with respect to x

i)3xin x2

ii)cot 2x (6 marks)

13. a) When f(x)=x3-ax+b is divided by x+1, the remainder is 2 and x+2 is a factor

Of f(x).

Find a and b. (6 marks)

b). if the root of the equation x2+2x+3=0 are . Form the equation whose roots

are – and . . (6 marks)

14. Express f(x)= into partial fraction hence evaluate

(12 marks)

15.a) It can be proved by induction that, for all positive n;

13+23+33\_\_\_+n3= n2(n+1)2. (6 marks)

b). A man deposits Shs. 800,000 into his savings account on which interest is

15% per annum. If he makes no withdrawals after how many years will his balance

Be shs.8 million? (6 marks)

16.a) use Demoives theorem or otherwise to simplify

b) Express in modulus-argument form. (4 marks)

c). Solve (z +2z)z =5+2z,where z is the complex conjugate of z. (5 marks)

**EYND**