Name:	Index no
School:	Candidate's sign

Date:

121/1 MATHEMATICS PAPER 1 JULY/AUGUST 2011 TIME: 2 ½ HOURS

BUSIA DISTRICT JOINT EVALUATION TEST

Kenya Certificate of Secondary Education (K.C.S.E.)

Mathematics Paper 1

INSTRUCTIONS TO CANDIDATES:

- Write your name, index number, Signature and write date of examination in the spaces provided
- The paper contains two sections. Section I and Section II.
- Answer ALL the questions in section I and any five questions in section II.
- Answers and working **must** be written on the question paper in the spaces provided below each question.
- Show all steps in your calculations below each question.
- Marks may be given for correct working even if the answer is wrong.
- Non programmable silent electronic calculators and KNEC mathematical table may be used, except where stated otherwise.

FOR EXAMINERS USE ONLY

SECTION 1

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TOTAL
Marks																	

SECTION II

Question	17	18	19	20	21	22	23	24	TOTAL	G	rand Total
Marks											

This paper consists of 15 printed pages. Candidates should check to ascertain that all papers are printed as indicated and that no questions are missing

© Busia– 2011

Form Four 1

Mathematics 121/1

Tips on passing KCSE subscribe freely @ http://www.joshuaarimi.com Connect with Joshua Arimi on facebook.

SECTION I (50 MARKS) Answer <u>all</u> questions

1. Evaluate without using tables or calculators.

$$\frac{6}{7} \text{ of } 14 \div 80 \text{ x } -\frac{20}{3}$$
$$- 2 \text{ x } 5 + (14 \div 7) \text{ x } 3$$

2. The GCD of two numbers is 7 and their LCM is 140. If one of the numbers is 20, find the other number. (2mks)

3. Simplify $\frac{3Z^2 - 12}{3 - (1 + Z)}$

(3mks)

(4mks)

4. Using a ruler and a pair of compasses only, construct triangle ABC in which AB = 6cm BC=8cm and angle $ABC = 45^{\circ}$. By construction find the shortest distance from A to BC. Measure the distance. (4mks)

5. A straight line through the points A (2,1) and B (4,m) is perpendicular to the line whose equation is 3y = 5-2x. Determine the value of m and the equation of line AB. (4mks)

6. Use reciprocal, square and square root table to evaluate to 4 significant figures, the expression

$$\sqrt{\frac{1}{24.56} + 4.346^2}$$

Show steps in your working.

(3mks)

© Busia– 2011

7. Calculate the area of the shaded region below, given that AC is an arc of a circle centre B. Given that AB = BC = 14cm, CD = 8cm and angle $ABD = 75^{\circ}$



8 The cost of a camera outside is US\$ 1000. James intends to buy one camera through an agent who deals in Japanese Yen. The agent charges him a commission of 5% on the price of the camera and further 1260 yen as important tax. How many Kshs. will he need to send to the agent to obtain the camera ,given that:-(3mks)

1US \$ = 105.00 Yen 1US \$ = Kshs. 63.00

9. The figure below represents a quadrilateral ABCD. Triangle ABX is an equilateral triangle. If angle $ADX = 50^{\circ}$, find angle AXD given that angle $BAD = 90^{\circ}$ (2mks)



© Busia- 2011

Form Four 4

10. Draw the net of the solid below and calculate surface area of its surfaces

(4mks)



11. A two –digit number is such that the sum of the ones digit and the tens digit is 10. If the digits are reversed, the number formed exceeds the original number by 54. Find the number. (4mks)

12. Solve the simultaneous equation

$$2x - y = 3$$
$$x^2 - xy = -4$$

(3mks)

© Busia– 2011

13. Metal cube of side 4.4cm was melted and the molten material used to make a sphere. (3mks) Find the radius of the sphere (take $\pi = \frac{22}{7}$)

14. Without using mathematical tables find θ given that Sin (2 θ -10) = Cos 6 θ ; $0^{\circ} \le \theta \le 90^{\circ}$ (2mks)

15. A shear parallel to the x-axis maps point (1,2) onto a point (5, 2). Determine the shear factors and hence state the shear matrix (invariant line is y = 0) (3mks)

16. Solve $4x - 3 \le 6x - 1 < 3x + 16$ and state all the integral values.

(3mks)

Tips on passing KCSE subscribe freely @ http://www.joshuaarimi.com Connect with Joshua Arimi on facebook.

SECTION II (50MKS)

Answer <u>any</u> five questions from this section in the spaces provided.

- 17. The distance between towns A and B is 360km. A minibus left A at 8.15am and traveled towards B at an average speed of 90km/hr. A matatu left B two and a third hours later on the same day and traveled towards A at an average speed of 110km/hr. (10mks)
 - a) i) At what time did the two vehicles meet?

ii) How far from A did the vehicles meet?

b) A motorist started from his home at 10.30am on the same day and travelled at an average speed of 100km/hr. He arrived at B at the same time as the minibus. Calculate the distance from A to his house.

18 The table shows marks obtained by 100 candidates at Goseta Secondary School in Biology examination.

Marks	15 - 24	25 - 34	35 - 44	45 - 54	55-64	65 - 74	75 - 84	85 - 94
Frequency	6	14	24	14	X	10	6	4

(a) Determine the value of x

(b) State the modal class

(c) Calculate the median mark

(d) Calculate the mean mark

© Busia– 2011

Mathematics 121/1

(2mks)

(lmk)

(3mks)

(4mks)

19 A right conical frustrum of base radius 7cm and top radius 3.5cm, and height of 6cm is stuck onto a cylinder of base radius 7cm and height 5cm which is further attached to a hemisphere to form a closed solid as shown below





(b) The surface area of the solid

(5mks)

(5mks)

© Busia– 2011

20 In the figure below, ABCD is a cyclic quadrilateral and that angle ABD = 42°, angle BAC= 58° and angle DBC 36°



Giving reasons, find the values of (a) Angle DAC

(2mks)

(2mks)

(b) Angle ADB

(c) Angle ACD

(d) Angle CDB

(2mks)

(2mks)

(e) Angle CEB

(2mks)

© Busia– 2011

Form Four 11

21. a) Complete the table of the functions $Y = 1+x - 2x^2$

х	-3	-2	-1	0	1	2	3
$-2x^2$	-18			0	-2		
1	1	1	1	1	1	1	1
у	-20	-9			0		

b) Draw the graph of

(2mks)

the function $Y = 1+x - 2x^2$ on the graph paper provided. (4mks) Use your graph to find the value for x in the equation $1 + x - 2x^2 = 0$

- c) By drawing a suitable line graph on the same graph find the value for **x** which satisfies the equation $+5 + 2x - 2x^2 = 0$ (3mks) (1mk)
- d) Stat e the maximum point of the function $Y = 1+x-2x^2$



© Busia- 2011

- 22 Two business women jointly bought a minibus which could ferry 25 paying passengers when full. The fare between two towns A and B was shs. 80 per passenger for one way. The minibus made three rounds trips between the two towns daily. The cost of fuel was shs. 1,500 per day. The drivers and the conductors were paid allowance of shs. 200 and shs 150 respectively. A further of shs. 4,000 per day was set aside for maintenance, insurance and loan repayment.
 - (a) One day the minibus was full on every trip.
 - (i) How much money was collected from the passengers that day.

(ii) How much was the net profit.

(2mks)

(3mks)

(b) On another day, the minibus was 80% full on average for the round trips how much did each business woman get if the days profit was shared to the ratio 2:3? (5mks)

23.	A(3, 7), B(5, 5), C(3, 1), D(1, 5)	
	(a) On the grid provided below, plot ABCD on a Cartesian plane	(2mks)
	(b) $A^{1}B^{1}C^{1}D^{1}$ is the image of ABCD under a translational T $\begin{bmatrix} 6 \end{bmatrix}$ J. Plot $A^{1}B^{1}C^{1}D^{1}$ and	1
	state its coordinates.	(2mks)
	(c) Plot $A^{11}B^{11}C^{11}D^{11}$, the image of $A^{1}B^{1}C^{1}D^{1}$ after a rotation about (-1, 0) through a	
	positive quarter turn. State its coordinates.	(3mks)
	(d) $\overline{A}^{111}B^{111}\overline{C}^{111}D^{111}$ is the image of $A^{11}B^{11}C^{11}D^{11}$ after a reflection in the line Y=x + 2.	
	Plot $A^{111}B^{111}C^{111}D^{111}$ and state its coordinates	(3mks)



© Busia– 2011

24. Wanjiku is standing at a point P. 160m south of a hill H on a level ground. From point P she observes the angle of elevation of the top of the hill to be 67°(a) Calculate the height of the hill

(b) After walking 420m due east to the point Q Wanjiku proceeds to point R due east of Q where the angle of elevation of the top of the hill is 35°. Calculate the angle of elevation of the top of the hill from Q (3mks)

(c) Calculate the distance from P to R

(4 mks)

(3mks)

© Busia– 2011