

### **BUNGOMA DISTRICT MOCK EXAMINATION** Kenya Certificate Of Secondary Education 2007

121 / 1 MATHEMATICS PAPER 1 JULY / AUGUST 2007

### **INSTRUCTIONS TO CANDIDATES**

- *1. Write your name and index number in the spaces provided at the top of this page.*
- 2. This paper consists of two sections: Section I and Section II.
- 3. Answer all questions in section I and any five questions from Section II.
- 4. Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
- 5. Marks may be given for correct working even if the answer is wrong.
- 6. Non-programmable silent electronic calculators **and KNEC** Mathematical tables may be used, except where stated otherwise.

	SECTION I															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

### For Examiner's Use Only

### SECTION II

CECTION

17	18	19	20	21	22	23	24	Total	Grand	
									Total	

This paper consists of 16 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

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# SECTION I (50 Marks) and Arrewere

### Answer All the question in this section.

- 1. Without using mathematical tables or calculator, evaluate  $\frac{0.08 \times 0.54 \times \sqrt{182.25}}{0.01 \times 0.012}$  (3marks)
- Potisit<sup>v</sup> 2. A solid metal cone has a diameter of 14cm and a height of 24 cm.
  - (a) **What** is the volume of the cone

(1mark)

(b) If the cone is melted and recast into a cylinder of the same diameter, what is the height of the cylinder. (2marks)

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- - 5. In the figure below, PQ is parallel to RS and the lines PS and RQ meet at T. Given that PT:TS=2:3 and RQ=10cm
    - (i) Show that triangle PTQ and STR are similar

R

 $\frac{1470^2}{\sqrt{7056}}$ , leaving the answer in numerical form

Hence find the length of RT (ii)

3.

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4. Simplify  $\left\{\frac{33y^4 \times 9y^5}{11y^{12}}\right\}^{\frac{1}{3}}$ 



(3marks)



- (2marks)

3 Express the number 1470 and 7056, each as product of its prime factor. Hence evaluate 6. One of the sides of a right angled triangle is 14cm longer than the shortest side but 4 cm shorter than the longest side; Find the area of the triangle (3marks)

4

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(b) Find the surface area of a glass cuboid block whose volume is 1504cm<sup>3</sup> if its length and breadth are 36cm and 24 cm respectively.
(2 marks)

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- 8. X (4, -3) and Y (-3, -2) are points on a straight line. Find the equation of the perpendicular of XY, giving your answer in the form  $\frac{X}{a} + \frac{y}{b} = 1$  (3 marks)
  - 9. The graph below shows the motion of a bus for 10 minutes



The bus moves from V to X. **Calculate** the distance (total distance) moved by the bus from V to X and hence its average speed. (3marks)

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- 10. In the figure below, O is the center of the circle ABCD and AOD is a straight line. If  $\overline{AB} = \overline{BC}$ and angle DAC= 400°, Calculate angle BAC. (3marks)
  - 11. Using a ruler and a pair of compasses only,
    - (a) **Construct** triangle ABC in which BC=8 cm, angle ABC=  $112 \frac{1}{2}^{0}$  and  $\langle BAC= 45^{0} \rangle$

(2marks)

(b) Drop a perpendicular from A to meet CB produced at P, hence **find** the area of triangle ABC. (2marks)

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A is a square whose sides are 5cm. A  $_1$  is the image of A under an enlargement scale factor  $^+4$ . 12.  $A_2$  is the image of  $A_2$  under enlargement scale factor <sup>+</sup>3.  $A_3$  is the image of  $A_2$  under an enlargement scate factor +2. Calculate: 

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The length of a side of A<sub>2</sub> (1mark)

The ratio of the area  $A_2$  to the area  $A_3$ (ii)

(2marks)

13. Solve the equation  $\frac{x+1}{2} = 1 - \frac{1-3x}{5}$ 

(2 marks)

A tailor brought two pair of trousers at sh 1600. He marked the price such that after allowing his 14. discount of 15%, he would still make a profit of 30% on the cost price. Determine the price at which a pair of trouser was marked. (3marks)

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Answers .dema parente por participation for the participation of the participati Without using mathematical tables and calculator, evaluate:  $3\log_{10}5 + \log_{10}64 - \log_{10}8$ 

8

(2 marks)

- A two digit number is made by combining any 2 of the digits 1,3,5,7,9 at random
  - Make an array of possible combinations

(2marks)

(2marks)

(b) Find the probability that the number is a prime number.

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## SECTION II (50 MARKS) and Businers Answer any FIVE Contract Answer any FIVE Ouestions in this section

17. Last year Bungoma Teachers Sacco received a gross income of sh. 12.5 Million from 50,000 shares. After paying salaries and other expenses, the Sacco had a balance of sh. 6.5 Million. Each year 80% of a balance is paid to members as dividends which is calculated per share. This year the sacco's gross income increased by 15%, the salaries and other expenses increased by 35% while members' share went up by 15000 shares calculate: ROT BIT (a) The amount of dividends paid per share last year (2marks)

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The amount of dividends paid per share this year. (b)

(5 marks)

- If Mr. Wamono had saved by 31<sup>st</sup> December last year Shs 40,000 and a share is sh 225, how (c) much dividend did he receive this year? (2 marks)
- (d) **Comment** on the sacco's performance for the last two years (1 mark)

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ALSWET At 2225 hours, an aeroplain Q is reported to be 19700 km on a bearing of  $060^{\circ}$  from town P and 18. heading towards it at 3000Km/h. At the same time, another plane C leaves town P and heads steadily at 4000 m/h on a bearing of 090<sup>0</sup>. At 0113 hours the two planes are closest together. Determine

10

n e distan e distan e distan periore tree tree trest postulation p The distance between the two planes at 0113 hours

(6 marks)

(b) How far away from town P the plane C will be when plane Q lands at town P, Leaving you answer nearest to Km (4 marks)

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The diagrams shows vertical telephone pole RS supported by wires SP and SQ pegged at points P and Q respectively on a level ground. Points P and Q are on the same straight line from the base R of the pole. The angles of elevation of S from P and Q are 33.9° and 48.2° respectively. Given that PR = the pole is cm, calculate: (a) The distance QR (4 marks)

and Answers

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19.

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<u>≺48.2</u>°

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(b) The length of the wires SP and SQ

(4 marks)

(c) If the cost of the pole and labour is sh. 1600 and the cost of 1 meter of the wire is sh. 233.
Find the total cost of the installation. (2 marks)

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- ALENETS A triangle  $\Delta_0$  has vertices A(1,0), B(1,2) and C(2,3). Its image  $\Delta_1$  under an enlargement E has 20. vertices  $A^{1}(3,-2), B^{1}(5,2)$  and  $C^{1}(5,4)$ . A triangle  $\Delta_{2}$  whose vertices are  $A^{11}(-3,-2), B^{11}(-3,2)$ and  $C^{11}(-5,4)$  is the image of  $\Delta_1$  under reflection R.
- (a) (i) **Draw** the three triangles on the graph paper provided. (4marks)

	(11) Hence <b>find</b> the center and scale factor of the enlargement	(2marks)
(b)	Find the equation of the line of reflection.	(2marks)
(c)	If $\Delta_0$ has an area of y square units, <b>state</b> the area of $\Delta_1$ in terms of y.	(2 marks)

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- 21. Given a quadrilateral ABCD is inscribed in a circle of center O and radius 6cm,  $\angle$  CDE=60<sup>0</sup>.
  - (ii)  $\angle CAO$  (2marks)

- (b) **Find** the
  - (i) Length of ON (2marks)

(ii) Area of the sector subtended by the major arc ABC (4 marks)

22. Below is a diagram of a unit cube OABCDEFG, in 3- dimensions.

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E = F E = F E = F E = FWrite down the co-ordinates of the vertices B, F and C.

(b) **Determine** column vectors

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- (i) AB (2marks)
- (ii) AG (2marks)

(c) (i) A point P has co-ordinates (-2, 3, 5). Write the position vector of P using the unit vectors i, j and k.

(1 mark)

(3marks)

(ii) Show that the points p(-2,3,5), Q(4,-6,-10) and R(0,0,0) are collinear. (2 marks)

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- and Answers A cylindrical storage tank of diameter 14cm is initially two thirds full of water. The tank is filled 23. by pipe of internal radius 5cm through which water flows at the rate of 56m per minute. Water starts flowing into the tank at 10.15 a.m and the tank is full at 2.55 p.m. not prest in the intervision of the prest is in the prest is in the prest of the pr
  - **Determine** the height of the tank.

(5marks)

Starting with the full tank, school uses water from this tank at the rate of 11,550 liters per (b) day. Find how long it takes to consume all the water assuming that no more water is added. (3 marks)

(c) How long does it take for the tap to fill the tank when empty. (2 marks)

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24. United Millers imports wheat from U.S.A at initial cost of 350 dollar per tone. The shipping costs and customs drify are then charged as 25% and 15% respectively. When the wheat reached Mombasa, an 8% of the initial cost is incurred to transport it to Kisumu.

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(a) Given that IUS dollar = Ksh82.40, calculate the total cost of importing 5 tonnes of wheat in Ksh.: (5 marks) (5 marks)

(b) The united millers intends to make a profit of 25%. Giving your answer to the nearest ten cents, calculate the price at which a 2 kg packet of wheat should be sold. (3 marks)

(c) **How much** profit shall the company realize from the sell of 1 tonne of wheat? (2 marks)

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