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121/1 **MATHEMATICS** PAPER 1 JULY/AUGUST, 2014 TIME: 2¹/₂ HOURS

KURIA WEST SUB-COUNTY JOINT EXAMINATION - 2014

Kenya Certificate of Secondary Education **MATHEMATICS** PÁPER 1 **TIME: 21/2 HRS.**

INSTRUCTION TO CANDIDATE'S:

- 1. Write your **name**, **index number** and **school** in the spaces provided above.
- 2. Sign and write the date of examination in spaces provided.
- 3. This paper consists of two Sections; Section I and Section II.
- 4. Answer all the questions in Section I and any five questions from Section II.
- 5. All answers and working must be written on the question paper in the spaces provided below each question.
- 6. Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.
- 7. Marks may be given for correct working even if the answer is wrong.
- 8. Non-programmable silent electronic calculators and KNEC Mathematical tables may be used, except where stated otherwise.
- 9. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

FOR EXAMINER'S USE ONLY:

SECTION I

40

\$°°

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

SECTION II

17	18	19	20	21	22	23	24	TOTAL

GRAND TOTAL

SECTION I: (50 MARKS) Answer all the question in this section in the spaces provided: XCBER?

1. **Evaluate:**

$$\frac{\sqrt{\frac{1}{4}} \text{ of } 3\frac{1}{2} + \frac{3}{2}\left(\frac{5}{2}, \frac{3}{4}, \frac{2}{3}\right)}{\frac{3}{4} \text{ of } 2\frac{1}{2} + \frac{3}{4}$$

(3mks)

For More Free KCSE Past Papere The average lap time for 3 athletes in a long distance race is 36 seconds, 40 seconds and 48 seconds respectively. If they all start the race at the same time, find the number of times the slowest runner will have been overlapped by the fastest at the time they all cross the starting point together again. (3mks)

- 3. Kamau toured Switerland from Germany. In Switzerland he bought his wife a present worth 72 Deutsche marks. Find the value of the present in
 - Swiss Francs. (a)
 - (b) Kenya shillings correct to the nearest sh, if
 - 1 Swiss Franc = 1.25 Deutsche marks 1 Swiss Franc = 48.2 Kenya shillings

(3mks)



(ii) Write down the equation of PQ.

5. Solve the equation $2\chi^2 + 3\chi = 5$ by completing the square method.. (3mks)

Given that $\frac{3}{2 - \sqrt{18}} + \frac{5}{2 + \sqrt{18}} = a + b\sqrt{a}e^{2\sqrt{5}}$ Find the values of a, b and c. 6.

Past papets Visit www.freekceet The mean of five numbers is 20. The mean of the first three numbers is 16. The fifth number is greater than the fourth by 8. Find the fifth number. (3m) For More Free (3mks)

8. Show that the points P(3, 4), Q(4, 3) and R(1, 6) are collinear. (3mks)

(3mks)

Solve the inequalities $t \le 2t + 7 \le -\frac{1}{3}t + 14$ hence represent the solution on a number line. 9. (3mks)

7.

10. Use the tables of squares, square roots and reciprocals only to find the value of

 $(0.0546)^{\frac{1}{2}} + \left(\frac{1}{4.327}\right)^{2}$ (3mks) (3mks)11. A sircle of radius 7 units has it's centre at the point of intersection between the lines $(\chi^{2} + 2y + 1 = 0 \text{ and } 2\chi + 3y - 3 = 0.$ Find the equation of the circle expressing it in the
form $\chi^{2} + y^{2} + y\chi + fy + c = 0.$ (3mks)

12. The gradient of a curve at any point (χ, y) is given by $3\chi^2 + 2\chi$. If the curve passes through the point (-2, 1). Find its equation. (3mks)

13. A solid metal cylinder with radius 7cm and height 5cm is melted down and recast into a spherical ball. Calculate to 1 decimal place the surface area of this ball. (4mks)

14. Sketch and label the net of the prism shown **below**.



The volume of two similar solid spheres are 4752cm³ and 1408cm³. If the surface area of the small sphere is 352cm², find the surface area of the larger sphere. (3mks)

16. A carpenter constructed a closed wooden box with internal measurements 1.5 metres long, 0.8 metres wide and 0.4 metres high. The wood used in constructing the box was 1.0cm thick and has a density of 0.6g/cm³. Determine the: (i) volume in cm³ of the wood used in constructing the box. (3mks)

(ii) mass of the box in kilograms correct to 1 decimal place. (1mk)

SECTION II: (50 MARKS) Answer any five questions from this section in the spaces provided:

- Two aeroplanes, T and S leave an airport A at the same time. S flies on a bearing of 060° at 17. 750km/h while T flies on a bearing of 210° at 900 km/h.
- Use a suitable scale, to draw a diagram showing the relative position of the aeroplanes (a) JURS. JURS. Visit Rot More Free KCSB Past papers Visit after two hours. (3mks)

Use your diagram to determine:

the distance between the two aeroplanes.

(ii) the bearing of T from S.

- (c) Aeroplane T later flew to the East at the same speed for one hour. Show its final position on the diagram in (a) above. Determine:
 - (i) Its final distance from A. (2mks)

(ii) Its final bearing from S. (1mk)

(2mks)

(1mk)

18. The table **below** shows the income tax rates for a certain year.



That year Kazembe paid net tax of Ksh.5,512 per month. His total monthly taxable allowances amounted to Ksh.15,220 and he was entitled to a monthly personal relief of Ksh.1,162. Every month the following deductions were made:

- NHIF – Ksh. 320

FOR NOTE FLEE (a)

Union dues – Ksh.200

[©]Co-operative shares – Ksh.7,500

Calculate Kazembe's monthly basic salary in Ksh.

(b) Calculate his monthly net salary.

(7mks)

(3mks)



(b) On the same grid draw the line $y + 3\chi = 2$.



- 20. A tetrahedron has equilateral triangular base \overrightarrow{ABC} of side 10cm. The vertex V is such that VA = VB = VC = 8cm. Calculate.
 - (a) The angle between the planes ABC and BCV.

(b) pothe vertical height of the vertex V above the base ABC.

(c) Volume of the tetrahedron.

(3mks)

(5mks)

21. In the given figure, $\angle CAD = 50^\circ$, $\angle BEC = 75^\circ$ and $\angle BDC = 25^\circ$. BAF is a straight line.



(iv) $\angle DAF$. (3mks)

- 22. A bag contains 5 red, 4 white and 3 blue beads. Two beads are selected at random one after another without replacement.
 - (a) Draw a tree diagram and show the probability space.





(iii) At least one of selected beads is blue.

(3mks)

- .com maps the points A(0, 0), B(2, 0), C(2, 3) A transformation represented by the matrix 23. and
 - D(0, 3) of the quad ABCD onto $A^{1}B_{1}^{1}C^{1}D^{1}$ respectively.
- ear AE al AE ear papers visit whethere there the Draw the quadrilateral ABCD and its image $A^{1}B^{1}C^{1}D^{1}$.

(3mks)

Hence or otherwise determine the area of A¹B¹C¹D¹. (2mks)

Another transformation $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$ maps A¹B¹C¹D¹ onto A¹¹B¹¹C¹¹D¹¹. (c) Draw the image A¹¹B¹¹C¹¹D¹¹. (2mks)

(d) Determine the single matrix which maps A¹¹B¹¹C¹¹D¹¹ back to ABCD. (3mks)

- The distance from town A to town B is 360kps. A bus left town A and traveled towards town B 24. at an average speed of 60km/h. After 1¹/₂ bours, a car left town A and traveled along the same road at an average speed of 100km/h.
 - (Determine (a)
- e of the For wore Free KCSB Past Papers Visit www.free For wore Free KCSB Past Papers Visit The distance of the bus from town A when the car took off. (2mks)

The distance the car traveled to catch up with the bus.

(4mks)

The distance from P to Q is 160km. If an express train was 16km/h slower it would take (b) 20 minutes longer on the journey. Find the average speed of the express train. (4mks)