Name…… **Index No……..**

School…… **Candidate's sign…….**

Date…….

121/1
MATHEMATICS
PAPER 1
July/August 2010
2 ½ hrs

MANGA DISTRICT JOINT EVALUATION TEST – 2010

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

MATHEMATICS
PAPER 1
July/August 2010
2 ½ hrs

INSTRUCTION TO CANDIDATES.

1. Write your name and index number in the spaces provided above
2. Sign and write the date of examination in the spaces provided.
3. The paper contains two sections: Section I and II.
4. Answer all questions in section I and strictly five questions from section II.
5. All answers and marking must be written on the question paper in the spaces provided below each question.
6. Show all the steps in your calculations, giving your answers at each stage in the spaces 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.

For examiner's use only.

Section I

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

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

SECTION I

Answer all the questions in this section.

1. Without using tables or calculators, evaluate

$$\frac{\frac{3}{4}\div\frac{9}{4}}{\frac{1}{3}+\frac{5}{9}}\div\frac{1}{5}$$ (3mks)

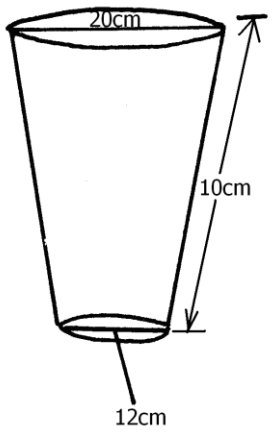
2. 5 goats and 2 sheep cost sh. 5400 while 3 goats and 4 sheep cost sh. 5200. Find the cost of each goat and each sheep. (3mks)

3. The external radius of a water pipe is 21.7cm and its thickness is 3.3cm. If the pipe is 6.5m, find the volume of the material used to make the pipe (give answer to 2d.p). (4mks)

4. A perpendicular is drawn from a point (4, 6) to the line $5y + 4x = 20$. Find its equation in the form $ay + bx = c$ where a, b and c are integers. (4mks)

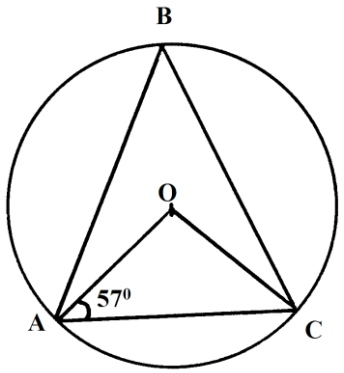
5. Factorize completely $5x^2 - 7xy + 2y^2$. (4mks)

6. The drawing shown below is a frustrum of a solid cone. Diameter PQ = 12cm and RS = 2cm respectively. If the slant height of the frustrum is 10cm, find the volume of the frustrum of the cone. (4mks)



7. Solve for x in the equation ½ $\log_2 81 + \log_2 (x^2 - {}^x/_3) = 1$ (4mks)

8. In the figure below, O is the centre of the circle. Given that AB = BC and angle OAC = 57^0, find angle ACB. (4mks)



9. Express $\frac{\sqrt{5}+\sqrt{3}}{2\sqrt{5}+\sqrt{3}}$ in the form $a + b\sqrt{c}$ where a, b and c are constants. (3mks)

10. The distance from town T to town S is 500km. A motorist finds that if he increases his speed by 3km/hr, he would take 20 minutes less to travel this distance. Find his average speed. (4mks)

11. Simplify completely $\frac{(x+3)^2+(3x-1)^2}{x^2+1}$ (2mks)

12. Find the value of x given $2^x = 0.125$ (3mks)

13. The length of the chord which is 4cm from the centre of a circle is 6cm. calculate the area of the circle. (3mks)

14. A two digit number is such that when the digits are reversed, the value of the number increases by 36. If the sum of the unit digit and twice the tens digit is 16, find the number. (3mks)

15. Given the column vector $\underset{\sim}{p} = \begin{pmatrix} -5 \\ 3 \end{pmatrix}, \underset{\sim}{q} = \begin{pmatrix} 4 \\ -8 \end{pmatrix}$ *and* $\underset{\sim}{r} = \begin{pmatrix} 6 \\ -9 \end{pmatrix}$ *and* $\underset{\sim}{t} = 2\underset{\sim}{p} - \frac{1}{2}\underset{\sim}{q} + \frac{1}{3}\underset{\sim}{r}$

(i) Express $\underset{\sim}{t}$ as a column vector (2mks)

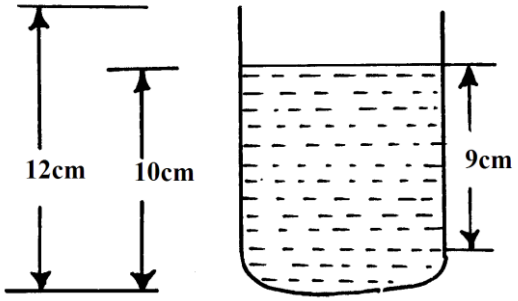
(ii) Calculate the magnitude of vector $\underset{\sim}{t}$ in (i) above correct to two decimal places. (2mks)

16. Determine the number of sides of a regular polygon whose interior angles add up to 1620^0. (2mks)

SECTION II (50MKS)

Answer any five questions from this section.

17. A test tube is in the shape of a cylinder with a hemispherical bottom as shown in the figure. The radius is 1cm and height 12cm. If the height of the liquid in the tube is 10cm measured from its lowest point, calculate the volume of the liquid. If the liquid has a density of $0.8g/cm^3$, find its mass. (10mks)



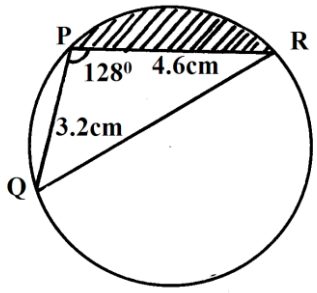
18. An importer buys cars from Japan at Japanese Yen 1563000 each.

(a) Calculate the cost of a car in Kshs if 100 Japanese Yen = Kshs 19.19. (2mks)

(b) On bringing the cars to Kenya, they are subjected to an import duty of 145% and a sale tax of 30%. If the impoter has to make 20% profit on sales, calculate the selling price of each car.

(8mks)

19. PQR is a triangle inscribed in a circle.



(a) Calculate the length of PR (3mks)

(b) Calculate the radius of the circle (3mks)

(c) Calculate the area of the shaded region. (4mks)

20. The following data shows the length of trees grown in Mau Forest measured to the nearest cm by a research team. Use the given data to answer the given questions.

230	240	250	253	260	253	274	238	263	260	231	284	257
260	275	271	257	267	255	265	241	256	256	257	260	262
234	259	263	244	254	248	281	240	247	236	256	282	242
246	277	238	250	279	252	269	284	271	249	273		

(a) Arrange the data in a frequency distribution table with a class interval of five and starting with the class of 230 – 234,… (6mks)

(b) Using the frequency distribution in (a) above and 257 as an assumed mean, find:-

(i) Mean of the data. (2mks)

(ii) The standard deviation of the data. (2mks)

21. Two towns A and B are 30km apart, B being due east of A. Town C is so situated that its bearing from A is 150^0 while from B it is 240^0.

(a) Draw a sketch figure to show the positions of the three towns. (3mks)

(b) Calculate the distance of C from both A and B. (7mks)

22. Kennedy and John cycle to a station 20km away. John cycles 2km/h faster than Kennedy and reaches there half an hour earlier. At what speed did Kennedy and John cycle? (10mks)

23. A circle centre P of radius 8cm, intersects another circle Q of radius 6cm at x and y and the length of their common chord is 9cm. Given further that PQ is perpendicular to XY, calculate the area common to both circles. (Use $\pi = 3.142$) (10mks)

24. Three brick layers have to lay a total of 5400 bricks and an average number of bricks they can lay in an hour are in the ratio 5:6:9. If the slowest man lays 60 bricks each of the other two lays in an hour, calculate

(a) How many bricks each of the other two men lay in an hour. (4mks)

(b) How many of the bricks each man will lay to complete the work if they are all employed for the same number of hours. (6mks)