Candidate's No. ……

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND CULTURE

FORM TWO SECONDARY EDUCATION EXAMINATIONS, 2005

0041 BASIC MATHEMATICS

TIME: 2½ HOURS

INSTRUCTIONS

1. This paper consists of sections A and B.
2. Answer ALL Questions in both sections.
3. Show clearly all the working and answer for each question item in both sections.
4. Write your examination number on the top right hand corner of every answer sheet.
5. Mathematical tables, geometrical instruments and graph papers may be used where necessary.
6. Pocket electronic calculators and cell phones are not allowed in the examination room.

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FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**SCORE**	**INITIALS OF EXAMINER**
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25.		
TOTAL		

This paper consists of 6 printed pages.

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SECTION A (60 MARKS)

1. (a) Subtract 25% of 24 from 6.

   (b) On a number line perform an operation of $-4-3$.

2. (a) Find the sum of $1\frac{2}{3}+2\frac{1}{2}+3\frac{4}{5}$

   (b) If 0.000701 is expressed in the form $A\times 10^{n}$, where $1\leq A<10$, and n is an integer, find the value of n.

3. Re-arrange the order of the digits in the number 5879613 to make it:

   (a) the largest number.

   (b) the smallest number.

4. Convert

   (a) 4 kilometres + 8 hectometres into centimetres.

   (b) 24 hours into seconds.

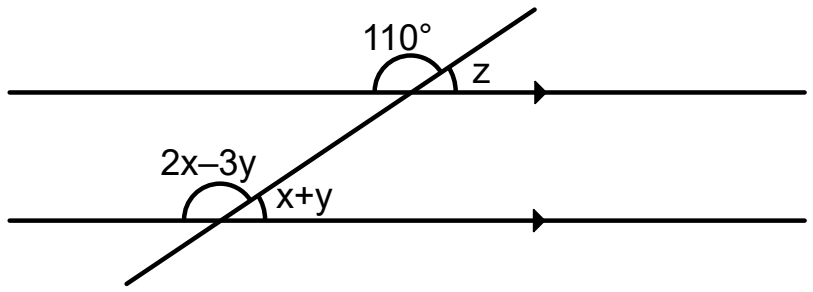
5. If $\log_{10}2=0.3010, \log_{10}3=0.4771$, evaluate $\log_{10}0.6$.

6. The population of Tanzanian citizens is at present 35,986,373. Round off this number of people to the nearest ten thousand.

7. From the figure that follows, find the values of:

   (a) $3x-2z$

   (b) $\frac{1}{2}y+z+17°$



8. The operation on the integers A and B is defined as $A * B = AB + 3B - 2A$.
   Find:

   (a) $3 * 2$.

   (b) x if $5 * x = 20$.

9. The line $8x + by = 12$ crosses the y-axis at the point $(0, 2)$. Find the value of b.

10. The amount of Tshs. 1,500,000 was divided among Fatma, David and Sameera in the ratio of $3: 5: 7$. How much money did each get?

11. (a) Rationalize the denominator of $\frac{2}{2\sqrt{3}+\sqrt{2}}$

    (b) Find the co-ordinates of the point P where the lines $y = -\frac{2}{3}x + 4$ and $y = 3x - 7$ meet.

12. (a) Find the ratio of the area (A) of a circle to its circumference (C).

    (b) If the circumference of a circle is 44cm, and its diameter is 14cm. Write in fraction the ratio of this circumference to the given diameter.

13. A cylindrical petrol tank is 0.8m deep and has a radius of 28cm. How many litres of petrol can fill this tank, given that $\pi = 3.14$ and 1 litre = 1000 cm^3.

14. Simplify completely the expression $18a^3b - 2abc^2$.

15. If $(3^{x-2})(3^{3y-3}) = 72$, find the values of x and y.

16. Make R the subject of the formula, given that $T = \frac{R+RV^2}{8M}$

17. Triangles ABC and STU are similar.

    $AB = 3cm$ and $ST = 2cm$. The area of triangle STU is $6cm^2$. Find the area of triangle ABC.

18. The translation T maps the origin onto a point $P(4, 8)$. Where will T map the points:
    (a) $Q(0, 4)$?

    (b) $N(-10, 8)$

19. The lengths of three sides of a right-angled triangle are $(x - 1)$cm, $(x - 8)$cm, and x. Find the value of x.

20. Given that $\tan\theta = \frac{3}{4}$, where θ is an acute angle,
    find the value of $\frac{2\cos\theta - \sin\theta}{3\sin\theta}$

SECTION B (40 MARKS)

21. The scores of a mathematics test by 50 Form Two pupils in a certain school are as shown in the following table.

MARKS %	45	50	55	60	65	70	75	80
NO. OF STUDENTS	6	$b + 3$	$2b + 3$	b	9	4	5	0

    (a) Find the value of b and calculate the number of students who scored 55% and above.

    (b) Calculate the mean score.

22. Use mathematical tables to calculate $\frac{608.7 \times \sqrt[3]{6.734}}{\sqrt{71.63}}$

    (Your final answer must be in two decimal places)

23. If A and B are two sets, where $n(A) = 45, n(B) = 32$, and $n(A \cup B) = 59$, determine $n(A \cap B)$.

24. A building has an angle of elevation of $35°$ from a point P, and an angle of elevation of $45°$ from a point Q. If the distance between points P and Q is 30cm; what is the height of the building? (Write your final answer correct to two decimal places).

25. (a) Find the solution set of the equations:

$$\begin{cases} x^2 + y^2 = 34 \\ x - y = 2 \end{cases}$$

(b) Find the values of m, p, and k such that $2x^2 - 8x + 15 = m(x + p)^2 + k$

-END-