PRESIDENT'S OFFICE

REGIONAL ADMISTRATION AND LOCAL GOVERNMENT

KIBAHA TOWN COUNCIL

FORM FOUR PRE - MOCK EXAMINATION MARCH 2021

BASIC MATHEMATICS

CODE: 41

TIME: 3 HOURS TUESDAY, 16/03/2021 A.M

INSTRUCTIONS:

1. This paper consists of sections **A** and **B** with a total of **fourteen (14)** questions.
2. Answer all questions in sections **A** and **B**. each question in section A carries six (6) marks while each question in section **B** carries ten (10) marks.
3. All necessary working and answers for each question must be shown clearly.
4. Cellular phones, calculators and any unauthorized materials are not allowed in the examination room.
5. **NECTA** Mathematical tables may be used.
6. Write your Examination Number on every page of your answer booklet(s).

FOR EXAMINERS USE ONLY		
QUESTION NUMBER	**SCORE**	**EXAMINER'S**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
TOTAL		
ENTERER'S INITIAL		
CHECKER'S INITIAL		

SECTION A (60 Marks)
Answer all questions in this section.

1. (a) Write the number 0.64682 into:
   (i) Three decimal places
   (ii) Four significant figures
   (iii) Expanded form

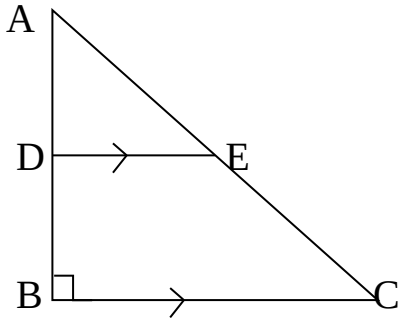
   (b) Estimate the value of 4.12 x 0.082

2. (a) Find the value of X for which $2^x 16 = \frac{1}{8^x}$
   (b) Rationalize the denominator $\frac{3+3\sqrt{2}}{5-3\sqrt{2}}$

3. Given that N = $\{X: 1 \leq X \leq 20\}$
   Find the following subsets of N
   (i) A = $\{X: X \text{ is a multiple of } 3\}$
   (ii) B = $\{X: X \text{ is a multiple of } 4\}$
   (iii) A'
   (iv) B'
   (v) $(A \cup B)'$
   (vi) $A' \cap B'$

4. (a) Find the equation of a line perpendicular bisector of the line whose end points of (2, 4) and (6, 8).
   (b) Given that a = 4i – 2j and b = -12i + 5j
   Find (i) 3a + 2b
   (ii) $|b|$
   (iii) A unit vector parallel to b

5. (a) The lengths of two sides of a triangle are 8cm and 10cm. find the area of the triangle if the included angle is 30˚.
   (b) In the figure below DE is parallel to BC
   AD = 6cm, BD = 3cm, DE = 4cm and <ABC = 90˚



   Thus Calculate; (i) The length of BC
   (ii) The ratio $\frac{AE}{AC}$

6. (a)Given that (Z + 1) is direct proportional to X and inversely proportional to the square root of Y. if X = 2 when Y = 4 and Z = 4.
   Find Z when X = 3 and Y = 9.

(b) The ratio of the number of girls to that of boys in school is 7:12. If the number of boys in school is 1380.

Find (i) The number of girls in school.

(ii) The total number of girls and boys in school.

7. (a) Two angles of a pentagon are 58˚ and 83˚. The other three angles are in the ratio 5:6:8. Find the largest angle.

(b) July 1st 2004, Mr. Alex John started business with a capital in cash 1,000,000/=

July:	2.	Purchased goods for cash	700,000/=
	3.	Sold goods for cash	500,000/=
	6.	Purchased goods for cash	300,000/=
	10.	Bought goods for cash	235,000/=
	15.	Paid cash for rent	110,000/=
	26.	Paid cash for wages	65,000/=
	28.	Sold goods for cash	310,000/=

From the above given transactions, prepare the trial balance.

8. (a) Find the sum of all multiples of 3 between 100 and 500.

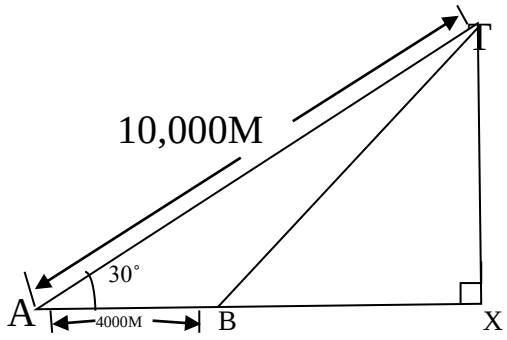
(b) The third term and eight term of a geometric progression are 3 and -96 respectively. Find the first term and the common ratio.

9. The figure below represents plotting of two stations A and B which are 4000M apart. T is a stationary target on the same vertical plane as A and B. when the distance of the target from station A is 10,000M the angle of elevation is 30˚.

Calculate (a) The vertical height of the target TX.

(b) The distance AX, BX and TB.

(c) The angle of elevation of the target T from B.



10. (a) Find the values of P and V given that:

$25x^2 - 30x - P = (5x - v)^2$

(b) Solve the equation $4x^2 - 32x + 12 = 0$ by using the quadratic formula.

SECTION B (40 Marks)

Answer ALL questions in this section

11. Carefully study the frequency distribution table below which shows the marks for 40 students in Civics examination:

MARKS	1 – 20	21 – 40	41 – 60	61 – 80	81 – 100
NUMBER OF STUDENTS	3	11	12	8	6

Determine;

(a) The Mean, given the Assumed mean is 50.5
(b) The Median
(c) Modal class and its corresponding class mark.

12. (a) A and B are two towns on latitude 40˚N. if A is on the Meridian 25˚E and B on the 55˚E. Find the length of the arc AB in kilometer.

(b) ABCDV is a square pyramid with the base ABCD while V is vertically above the center E of the base.

(i) Draw the three dimensional figure of the pyramid
(ii) Is it true that BV and AD are skew lines? Give reason(s)

13. (a) Fid t given that A = $\begin{pmatrix} 6 & 2t \\ t & 0 \end{pmatrix}$ and $|A|$= -50

(b) Given a set of equations

$$\begin{cases} 3x + 2y = 1 \\ 5x + 4y = 3 \end{cases}$$

Write in Matrix form, and hence find the inverse of the Matrix.

14. (a) A firm makes curtains which are either ordinary or deluxe. Each ordinary curtain takes 3 hours to produce and uses 6m of material, and each deluxe curtain takes 6 hours to produce and uses 7m of material. The workers of the firm can work for a total of 60 hours and there is 90m of material available. If the profit on ordinary and deluxe curtains is 4,000 Tshs and 6,000 Tshs respectively. Find how many of each should be made to maximize profit.

(b) Given the function $f(x) = x^2 + 3$

(i) Find $f^{-1}(x)$
(ii) State the domain and range of $f^{-1}(x)$.

***** *END* *****