PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

LINDI MUNICIPAL COUNCIL

FORM FOUR UMEKTA EXAMINATION

041 BASIC MATHEMATICS

TIME: 3 HOURS **JULY 2023**

INSTRUCTIONS

1. This paper consists of fourteen (**14**) compulsory questions.
2. This paper consists of sections **A** and **B**.
3. Mathematical table and non-programmable calculators may be used.
4. Cellular phones are not allowed.
5. The following constants may be used

   (a) Radius of the Earth R = 6370km

   (b) $\Pi = \frac{22}{7}$

SECTION A (60 marks)

1. (a) Arrange the order of the digits in 289414 to make
   (i) The largest possible number (1.5 *marks*)
   (ii) The smallest possible number (1.5 *marks*)

   (b) Use a number line to get a solution; $^{(+)}7 - {}^{(+)}4$ (3 *marks*)

2. (a) Find the value of X; $log_3(x + 16) - log_3 x = 2$ (3 *marks*)

   (b) Find the value of P, If $\left(\frac{1}{64}\right)^{2+p} = 2^6$ (3 *marks*)

3. (a) In a group of 240 tourists, 80 speak English, 120 speak French and 60 speak both English and French. How many speak neither English nor French. (Use Venn Diagram) (2 *marks*)

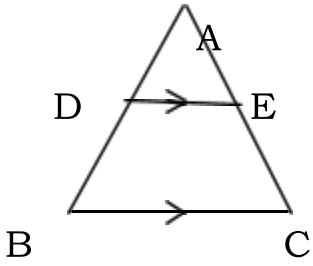
   (b) A fair die and coin are tossed; show all possible results in a table and a tree diagram. (4 *marks*)

4. (a) Find the equations of these lines
   (i) Gradient 4 and y-intercept -2 (1.5 *marks*)
   (ii) Through (4,7) and (-2,10) (1.5 *marks*)

   (b) Let a= 4i + 2j and b = 6i + 2j. Find $|a - 2b|$ (3 *marks*)

5. (a) Determine the length of one side of regular polygon of interior angle of 144^0 when inscribed to the circle of a radius of 10cm. (3 *marks*)

   (b) In a figure below DE// BC



(3 *marks*)

Given that, AE=4dm, AB= 8dm, DE= 10dm. Find the value of BC.

6. (a) How many grams are there in 0.00912 tones (t) (3 *marks*)
   (b) Solo, Theresia, Msuku and Mwanaidi can eat 2 bags of rice in 12 days. Each bag weghs 10kg. How many people can eat 6 bags of the same weight in 18 days. (3 *marks*)

7. Kichan started business on 1st June 2011 with a capital of 100,000/= and made the following transactions:

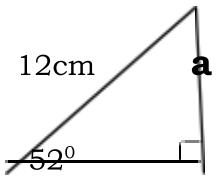
June 2:	Bought office furniture	40,000/=
7:	Bought goods	70,000/=
11:	Sold goods	65,000/=
16:	Paid Sundry Expenses	30,000/=
19:	Cash sales	80,000/=
24:	Paid wages	50,000/=

Required: Prepare Cash Account and Purchases Account at the end of the month. (6 *marks*)

8. (a) Find the sum of the first 10 terms of the series, -1 + 2 – 4 + ... (4 *marks*)

(b) If 2, **x**, 20 are terms of A.P. Find the value of **x**. (2 *marks*)

9. (a) Find the value of **a**



(2 *marks*)

(b) In a triangle LMN, LM=6m,LN=5m and <MLN = 66^0. Find

(i) the length MN(Use Cosine Rule) (2 *marks*)

(ii) the angle <N(Use Sine Rule) (2 *marks*)

10. (a) Solve the equation $x^2 + 6x + 2 = 0$ by completing the square. (3 *marks*)

(b) Expand and simplify $(2x + 5)(2x - 5)$ (3 *marks*)

SECTION B: (Marks 40%)

11. (a) The examination results of Form Three students at Loyola Secondary School are recorded for a group of students:

Marks (%)	30 – 39	40 - 49	50 - 59	60 - 69	70 – 79
Frequency	5	3	20	2	10

(i) Draw a histogram (4 *marks*)

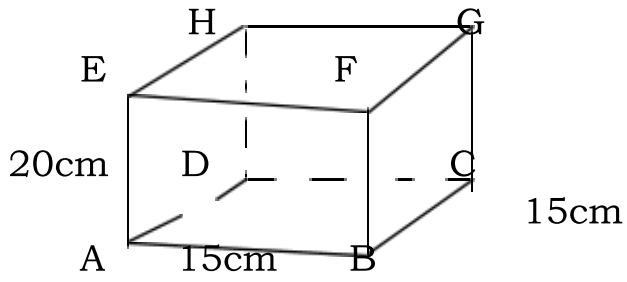
(ii) State the modal class (1 *marks*)

(iii) Estimate the mode from 2(a) (1 *marks*)

(b) Find the probability of choosing (i) a face card $(1.5\ marks)$

(ii) an ace card $(1.5\ marks)$

12. (a) The figure below represents a regular cuboids ABCDEFGH with AB=15cm,AE=20cm and AD= 15cm. Find the
    (i) the length AG $(3\ marks)$
    (ii) the angle between AG and the plane ABCD $(1.5\ marks)$
    (iii) the volume of the cuboids. $(1.5\ marks)$



(b) Calculate the distance from Changwe (5^0S,39^0E) to Mangwe(2^0S,39^0E) in kilometers. Write the answer correct to one decimal place. $(4\ marks)$

13. (a) Find the value of y given that
    $(2x\ 5\ 10\ x)$ is non – singular matrix $(3\ marks)$
    (b) Use Crammer's rule to solve for X and Y

$\{4x + 3y = 6 \ldots (i)\ 2x + 5y = 12 \ldots (ii)$ (4 m

(c) Find the matrix which rotates by 45^0 about the origin. $(2\ marks)$

14. A firm makes curtains which are either ordinary or de luxe. Each ordinary curtain takes **3**hours to produce and uses **6**m of material and each de luxe curtain takes **6**hours to produce and uses **7**m of material. The workers of the firm can work for a total of **60** hours and there is **90**m of material available. If the profit on ordinary and de luxe curtains is **4,000**/= TSH and **6,000**/= TSH respectively, find how many of each should be made to maximize profit. $(10\ marks)$