PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

LINDI REGIONAL

FORM FOUR MOCK EXAMINATION

041 BASIC MATHEMATICS

TIME: 3:00HOURS MAY 2023 .

Instructions

1. This paper consists of section A and B with a total of **14** questions
2. Answer all Questions
3. Each question in section **A** carries six **(06)** Marks while each question in section B carries ten **(10)** Marks
4. All necessary working and Answers for each question must be shown clearly.
5. **NECTA** mathematical tables and non-programmable calculators may be used.
6. All communications devices and any Unauthorized material are not allowed in the examinations
7. Write your examination number on every page of your answer sheets

SECTION A **(60 Marks)**

Answer all questions in this section

1. (a) Find the approximate value of the expression by rounding off each number in the Expression $\frac{0.0695\times19812}{6.8125}$ to one significant figure

(b) Square tiles are used to build a floor measuring 12metres by 16metres. If the tiles are of different sizes and only whole ones are used.

(i) What is the largest size of the tiles?

(ii). How many tiles used to cover the whole floor

2. (a) Given that, $3^n = 1.2$ without using tables find the value of

$$\frac{9^{2n-1}}{27^{n-1}}$$

(b) Solve for x if $(x)^2 - x^{\frac{1}{2}} = 1.5$

3. Kilabela secondary school. 40 students were asked about whether they like Volleyball or Netball or Both. It was found that the number of students who like Both Volleyball and Netball was three times the number of students who like Volleyball only. Furthermore, the number of students who like Netball only was 6 More than twice the number of students who like Volleyball only. However 4 Students like neither Volleyball nor Netball

(a) Represent this information in a Venn diagram letting y be the number of students who like Volleyball only?

(b) Use the results obtained in part (a) to determine the probability that a student selected at random likes;

(i) Volleyball only

(ii) Both volleyball and Netball

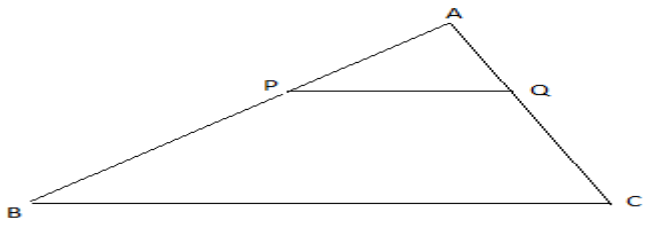
4. (a) (i) Find the equation of a line passing through point (2, 4) and the midpoint of (0, 6) and (10, 12). Write your answer in form of ax+by+c=0.

(ii) If the line from the point $(-4, y_1)$ to the point $(x_2, -3)$ is bisected at the point (1, 1). Find the values of y_1 and x_2

(b) Determine whether the triangle with vertices O (0, 0), A (-6, 8) and B (-14, 2) is

Equilateral, Isosceles, Scalene

5. In the figure below $\overline{PQ} \parallel \overline{BC}$, $\overline{AP} = 3\ cm$,$\overline{PB} = 4.5\ cm$ and $\overline{AQ} = 2\ cm$ and the area of $\Delta APQ = 8\ cm^2$.
   (a) Show that ΔAPQ is similar to ΔABC
   (b) Calculate the length of $\overline{QC}$
   (c) Find the area of ΔABC



6. (a) A students had two plant seedlings. She measured the rate at which the seedlings were growing. Seedling A grew 5 cm in 10 days and seedling B grew 8 cm in 12 days.
   Which seedling was growing more quickly?
   (b) Suppose x varies directly as y square and inversely as p. if x=2, when y=3 and p=1, Find the value of y when x=4 and p=5.

7. (a) Kijuguu got a profit of 20% when sold a Radio for Tshs 122400. What would be her percentage loss if she sale a radio for Tsh 76500?
   (b) Given that the following transactions.
   Sales for 2019--------- 51,000tshs
   Stock at start ----------9,000tshs
   Purchases ----------34,650tshs
   Stock at close ----------6,000tshs
   Return on sales ---------1,000tshs
   Return on purchase -----150tshs
   From the transaction deduce.
   (i) Cost of goods for sale (ii) Average stock (iii) Net sales (turn over)

8. (a) Kabujage Saved Tshs 6 million in a savings Bank whose interest rate was 100% compounded annually. Find the amount in Kabujages's savings accounts after 5 years
   (b) A small business sells products with 1,000,000tshs during its first year. The owner of the business has set a goal of increasing annual sales by Tshs 750,000 each year. Assuming this goal is met. Find the total sales during the first 10 years of the business in operation

9. (a) A rope of length 39m is tied to the top of a flag pole. The other end of a rope is fixed at a point 36m from the base of the flag pole. How high is the flag pole?
   (b) A student 1.6m tall and standing 52m from the foot of tree sees a bird on top of the tree

   If the angle of elevation of the bird from his eye is 32^0, find the height of the tree.

10. (a) Use completing the square to solve the quadratic equation $2x^2 + 18x + 28 = 0$
    (b) When 6 is divided by a certain number, the result is the same as when 5 is added to the number and that sum divided by 6. Find the number.

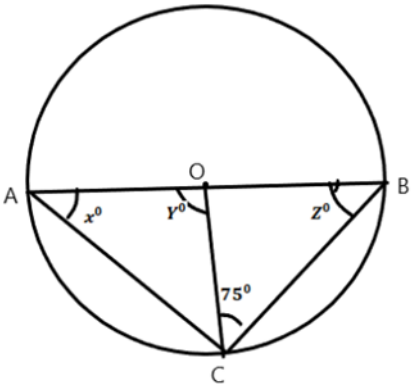
SECTION B: (40 MARKS)

11. (a). The frequency distribution table below shows the distribution of 100 families according to their expenditure per week.

Expenditure	0-10	10-20	20-30	30-40	40-50
Number of families	14	X	27	Y	15

(i) Calculate the missing frequencies if the mode is 24.
(ii) The median
(iii) Find mean by using assumed mean = 25

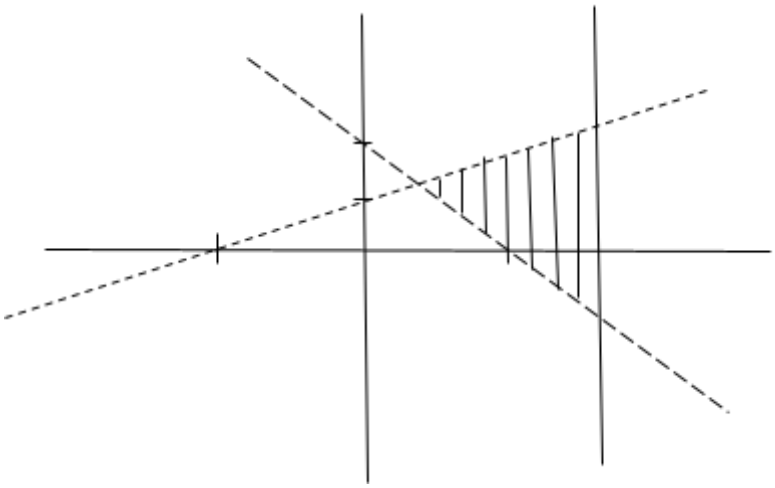
(b). (AB) is a diameter of circle .If <OCB=75°, find the values of x, y and z



12. (a) A speed boat travelling from Mwanza (6^0 S,45^0E), to Mara(9^0S,45^0 E) using 30 knots left Mwanza at 11:30 a.m. At what time did it reach Mara?
(b) A right rectangular pyramid has sides of the base 6cm by 8cm and slant height 13cm, now;
(i) Sketch the right pyramid showing the above information.
(ii) Determine the height of the pyramid
(iii) Determine the angle between the base and the slant edge.
(iv) Determine the volume of the pyramid

13. (a) One pair of opposite sides of a parallelogram is (4x+y) units and (3x+5) units while the other pair is (2x-y) units and 4 units. Find the value of x and y
(b) Find the image of the value of point (x, y) obtained from (a) above when it is first rotated through 90^0 $anticlockwise$ about the origin and then followed by reflection about the line y+x=0

14 (a) Given$f(x) = 2^x + 2$. Find $f^{-1}(18)$
(b) The graph below represents a relation *R*



(i) Find the relation *R*
(ii) State the domain and range of the relation *R* from the graph

(c)A function $f(x)$ is defined$as\ f(x) = \{x\ if\ x\ <-\ 2\ x^2\ if\ -\ 2 \leq x\ <\ 3\ x\ +\ 1\ if\ x \geq 3$
(i) Sketch the graph of $f(x)$.

ii) Use the graph to determine the domain and range of $f(x)$.