THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
FORM TWO NATIONAL ASSESSMENT

042 **ADDITIONAL MATHEMATICS**

Time: 2:30 Hours **Year: 2015**

Instructions

1. This paper consists of two sections **A** and **B** with total of twenty five **(25)** **Compulsory** questions**.**.
2. Answer **all** questions.
3. All writing must be in **blue** or **black** ink **except** drawing which must be in pencil.
4. Cellular phones and any unathorized materials are **not** allowed in the assessmenmt room.
5. Write your **Assessment Number** at the top right hand corner of every page.

SECTION A (60 MARKS)

Answer all questions

1. Write the next three numbers in the pattern: 4, 8, 12, 20, ...

2. Make x the subject of the formula: $m = \frac{y-b}{x-a}$.

3. If the interior angles of a qudrilaterals are $2x$, $2x-1^\circ$, $3x-10^\circ$ and $x-13^\circ$, find the value of x.

4. Use divisibility rule to show whether 47187 is divisible by 9 or not.

5. (a) Write each of the following expressions in simplest form

   a) $7m - 2n + 6 - 5m + 7n + 3$

   b) $\frac{72a^2b}{8a} - 8ab$

6. Find x : y given that (x + y):(2x + y) = 4:5.

7. (a) The table below shows the connectives used in logic. Write the symbol used for each connective:

Connective	**Symbol**
Equivalence	
Disjunction	
Condition	
Conjunction	

(b) Write the following statement in symbolic form: "If 2 is an even number, then 5 is an odd number."

8. (i) Draw all lines of symmetry in the following figure:



(ii) State the number of lines of symmetry

9. Find the value of $\boldsymbol{t}$ in the equation: $\frac{1}{2}t + \frac{2}{5} = t - \frac{4}{5}$.

10. The period T of a simple pendulum varies directly with the square root of length l of the pendulum and when the period is1.2sthe length is 0.36m.

11. Find the equation of locus of the points which are equidistant from the points A(1,1) and B(5,3).

12. Find the coordinates of the midpoint of the line segment which joins the points P(3,7) and R(5,9).

13. (a) Define the term „Non-Collinear points".

(b) Find k if the points R(3,4), S(k ,1)and T(15,−5) are collinear.

14. Find the number of sides of the polygon whose sum of interior angles is 540^0.

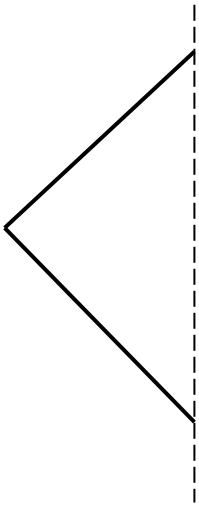
15. Find the points of intersection of the curve $y = x^2$ and the line $y = 2x + 3$.

16.(a) Define the term “Contradiction” as it is used in logic.

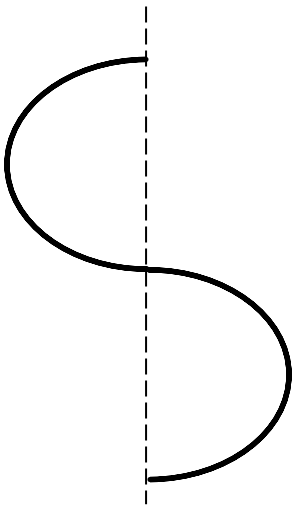
(b) Write the contrapositive of the proposition $(p \vee q) \rightarrow \sim q$.

17. Complete the shapes of the provided figures which contained lines of symmetry indicated by dotted lines.

a)



(b)



18. Find the stationary point on the quadratic function $y = x^2 + 10x + 10$.

19. If $a * b = ab^2 - 2b$ a*b, find $(2 * 3) * 5$.

20. The average score of a student in four subjects was 80 marks. Find an average score of five subjects if the score in the fifth subject was 95 marks.

SECTION B(40 Marks)

Answer all questions

21. Use graphical method to solve the following simultaneous equations:

$$\begin{cases} y = x^2 - 1 \\ y = 2x - 2 \end{cases}$$

22. In a group of tourists, 37 like chicken, 48 like fish and 45 like beef, 15 like chicken and fish, 13 like fish and beef, 7 like chicken and beef and 5 like all the three"

a) Draw a Venn diagram to represent the given information,

b) Find the number of tourists who like Beef only.....

.....

c) Calculate the number of tourists in the group if each tourist has at least one choice.

23.(a) Write the converse of the statement "If x is a negative number then x^2 is positive.

(b) Show that the proposition $(\sim P \wedge Q) \wedge (Q \rightarrow P)$ is a contradiction by using a truth table.

(c) Draw the electrical circuit of the compound statement $P \wedge R \wedge (P \vee S)$.

24.(a) The line y = 2x + 4 which is parallel to another line which passes through the points (k,4) and (4,6), find the value of k .

(b) Find the equation of a line which is perpendicular to the line $y = \frac{3}{4}x + 4$ and passes through the point (1, 4).

25. Given thta y is directly proportional to the square of x and inversely proportional to z. If y =12 , when x =10 and z = 50; find y when z=50 and z=30