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

042 **ADDITIONAL MATHEMATICS**

Time: 2:30 Hours **Year: 2018**

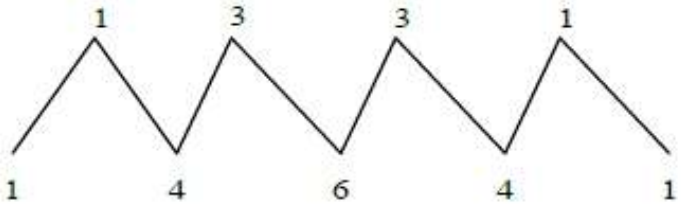
Instructions

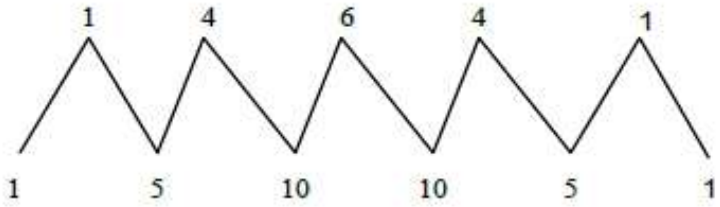
1. This paper consists of **ten (10)** questions.
2. Answer **all** questions.
3. All writing must be in **blue** or **black** ink **except** drawing which must be in pencil.
4. Cellular phones and any unauthorized materials are **not** allowed in the assessment room.
5. Write your **Assessment Number** at the top right-hand corner of every page.

1. (a) Write the first four multiples of 17.

   (b) Identify the numbers which are divisible by 3 among 8476, 942, 5181, 7124, 35768 and 91284.

   (c) Predict the next two patterns of triangular numbers as follows:





2. (a) Make b the subject from the formula $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$

   (b) Determine the value of n by using the formula $c = \frac{nE}{R + nr}$, where c = 1.5, E = 3, R = 6.3 and r = 1.1

   (c) Show the following inequalities on a number line

   (i) $x \geq -3$

   (ii) $-2 < x < 3$

3. (a) ind the sum of interior angles of regular pentagon and hence determine the size of each interior angle.

   (b) Draw a regular hexagon with 5cm each side.

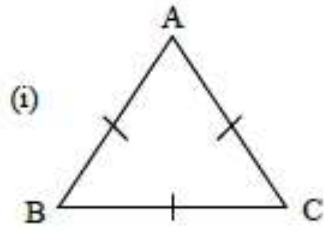
4. (a) find the equation of locus of the points which have equal distance from points A (-5, 8) and B (6, 7).

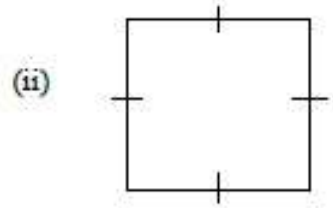
   (b) equation of the locus of point P which its distance from point A $(-1,-3)$ is twice its distance from point B (2,4).

5. (a) Find the value of r from the line joining point $P(r,3)$ to the point $Q(2,-3)$ which is perpendicular to the line joining point $R(10,1)$ to point Q.

   (b) Find the equation of a line passing through the point $(1,-3)$ which is parallel to the line $2x + 3y - 4 = 0$.

6. (a) Find the number of lines of symmetry for the following figures:





   (b) Draw the lines of symmetry on the figures in part (a).

7. (a) Let p be "He is tall" and q be "He is handsome". Write the following statements in symbolic form:

   (i) He is tall or he is short and handsome.

   (ii) It is not true that he is short or not handsome.

   (iii) He is handsome if and only if he is tall.

(iv) If he is handsome then he is either tall or short.

(b) (i) Construct a truth table of the compound proposition $(p \vee q) \wedge (: p \vee q)$

(ii) Show whether the logical statement $(p \rightarrow q) \vee (q \rightarrow p)$ is tautology or not.

8. (a) Given that variable y varies jointly as x and z. If y = 10, x = 4 and z = 5, find the value of z when x = 2, and y = 5

(b) If 2 students can type 210 pages in 3 days, find the number of students that are needed to type 700 pages in 2 days.

9. In a group of 450 students; 100 play volleyball, 70 play athletics, 200 play drama, 90 play volleyball and participate in drama, 30 play volleyball and athletics, 45 athletics and participate in drama, 220 do not participate in any game. Use the general formula of union of sets to find the number of participants in all games.

10. Solve the following set of equations simultaneously using substitution method.

$$\begin{cases} xy = 64 \\ 4x - y = 60 \end{cases}$$