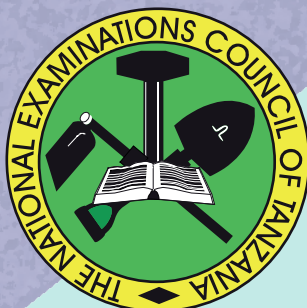


THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



**PUPILS' ITEM RESPONSE ANALYSIS REPORT
FOR STANDARD FOUR NATIONAL ASSESSMENT
(SFNA) 2018**

04E MATHEMATICS

THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



**PUPILS' ITEM RESPONSE ANALYSIS REPORT FOR
THE STANDARD FOUR NATIONAL ASSESSMENT
(SFNA) 2018**

MATHEMATICS

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FOREWORD

The Pupils' Item Response Analysis Report for Standard Four National Assessment (SFNA) in 2018 has been prepared in order to give feedback to pupils, teachers, curriculum developers, policy makers and other education stakeholders on how the pupils answered the assessment questions in Mathematics subject.

The analysis of the pupils' responses shows that, some of the reasons that contributed to pupils' failure to answer the assessment questions correctly include; failure to identify the requirements of the question, making errors when performing mathematical operations, lack of arithmetic skills of writing and counting; and lack of adequate knowledge on solving word problems correctly.

The National Examinations Council of Tanzania believes that, this report will be helpful to improve the pupils' competences in Reading, Writing and Arithmetic skills from standard one. If these skills are well improved they will build a strong base for standard four pupils to develop interest in Mathematics subject.

Lastly, the National Examinations Council of Tanzania would like to thank all examination officers and other experts who participated in preparing this report.



Dr. Charles E. Msonde
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The National Assessment for Standard Four Pupils in Mathematics subject was held on 22 November 2018. A total of 1,362,523 pupils were registered, of which 1,300,957 pupils, equivalent to 95.5 percent sat for the assessment in Mathematics subject.

The analysis of data in Mathematics subject assessment results in 2018 shows that, 1,077,095 pupils, equivalent to 82.8 percent, passed. In 2017, a total of 1,157,474 pupils, equivalent to 97.1 percent, were assessed and out of those 806,611 pupils, equivalent to 69.7 percent passed. These results show that, the performance in 2018 has increased by 13.1 percent as compared to the performance in 2017.

The Mathematics Assessment paper consisted of five (5) questions. Each question had five parts, that is; (a), (b), (c), (d) and (e) where the correct answer in each part was awarded two (2) marks, and the incorrect answer was awarded zero (0) mark. So, each question weighed ten (10) marks making a total of 50 marks for the whole paper.

The pupils' responses in each question were analysed in order to identify the reasons that made the pupils pass or fail. The samples of extracts from some of the pupils were provided in order to illustrate the actual performance of pupils in the assessment in a specific question.

The analysis was done for all five (5) questions constituting a total of twenty five (25) parts that were in the assessment paper. The percentage of pupils who passed in each question were used to determine the performance standards. The analysis of performance for each question were categorized into four groups as follows; 10 marks is "*very good performance*", 8 marks is "*good performance*", 4 or 6 marks is "*average performance*" and 0 or 2 marks is "*weak performance*". On the other hand, the standards of performance by competences considered the percentage of pupils who passed in each competence where; 67 – 100 indicates *good performance*, 34 – 66 *average performance* and 0 – 33 *weak performance*.

2.0 ANALYSIS OF THE PUPILS' RESPONSES

The analysis of the pupils' responses has been done in each item basing on the number and percentage of the pupils' performance as follows:

- (a) Those who failed to answer correctly any item or answered correctly one item, (0 or 2 marks).
- (b) Those who answered correctly two or three items, (4 or 6 marks).
- (c) Those who answered correctly four items, (8 marks).
- (d) Those who answered correctly all the five items, (10 marks).

The colours used in the analysis for each question to represents the performance of the pupils are shown in the following table:

COLOUR	MARKS	PERFORMANCE LEVEL
	10	Very good
	8	Good
	4 or 6	Average
	0 or 2	Weak

2.1 Question 1:

- (a) Write the number 20,392 in words.
- (b) Write XXXIV in Arabic numbers.
- (c) Write the place of value of the underlined digit of the number 3402.
- (d) Write the following number in expanded form: 9536
- (e) The pupils planted 680 trees so as to conserve the school environment. Write the number of planted trees in words.

This question had five parts which assessed various skills on the competence in applying the concepts of numbers to communicate in different context; part (a) assessed the pupils' knowledge to write the given number in words, part (b) assessed the pupils' ability to read

and write Roman numbers in Arabic numbers, part (c) assessed the pupils' knowledge on identifying the place value of a particular digit of the given whole number, part (d) assessed the pupils' ability to write the number in expanded form and part (e) assessed the pupils' ability to relate concept of numbers with real situation in the pupil's environment.

The analysis of data shows that, the performance in this question was average because a total of 782,876 pupils, equivalent to 60.2 percent scored from 4 to 10 marks. Among these pupils, 302,786 pupils, equivalent to 23.3 percent scored 8 or 10 marks and 480,090 pupils, equivalent to 36.9 percent scored 4 or 6 marks. However, 518,025 pupils, equivalent to 39.8 percent had weak performance as they scored 0 or 2 marks. The summary of the performance in this question is shown in Figure 1.

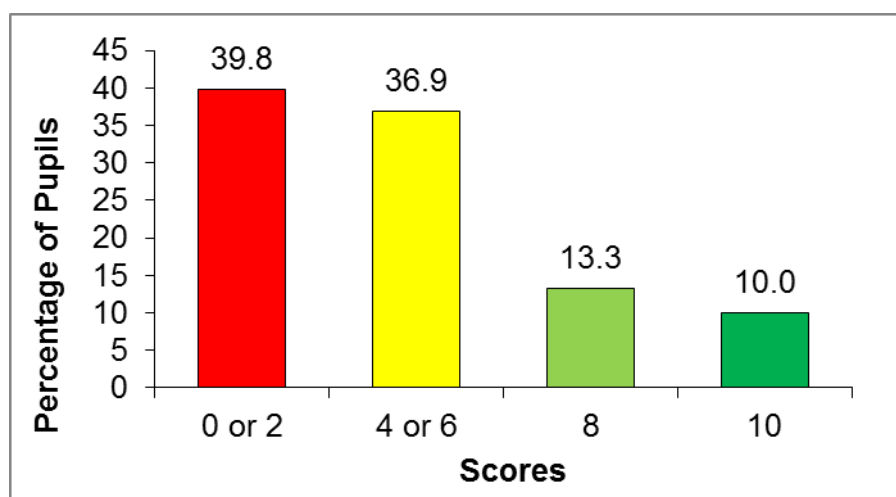


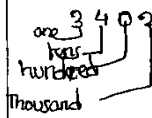
Figure 1: The percentage of pupils and their scores in question 1.

Further analysis of data shows that, out of 518,025 pupils who failed this question, 270,941 equivalent to 20.8 percent scored 0 mark. These pupils failed to answer this question correctly due to different reasons including; failure to write the number in words in part (a). For example, instead of writing *twenty thousand three hundred ninety two*, some of the pupils wrote *twety thousad three hundre and nanity two*, failure to write the given Roman number in Arabic number in part (b). The majority of the pupils were not aware of the rule that, when I (1) is written before V (5), that is IV becomes $(5-1=4)$, instead they

wrote $IV = 5 + 1 = 6$, so that number (XXXIV) is 36 which is an incorrect answer.

Moreover, some of the pupils failed to write the place value of the underlined digit (4) in the number 3402 in part (c) as they failed to know that the place value of the digit is in hundreds, and hence they failed to write its place value. In part (d), they were unable to write 9536 in expanded form that is $9000 + 500 + 30 + 6$, due to lack of knowledge about the position and place value of the digits in the given number. In part (e), they failed to relate the number with things present in their environment so as to write 680 in words as shown in Extract 1.1.

Extract 1.1

No	Question	Working Space	Answer
1. (a)	Write the number 20,392 in words.	20,392	twenty thousand three hundred and ninety two
(b)	Write XXXIV in Arabic numbers.	xxxiv	36
(c)	Write the place value of the underlined digit of the number 3402.	 <p>the place value of 4 is hundreds</p>	The place value of the 4 is hundreds
(d)	Write the following number in expanded form: 9536	$9000 + 500 + 300 + 60$	$9000 + 500 + 300 + 60$
(e)	The pupils planted 680 trees so as to conserve the school environment. Write the number of planted trees in words.	six hundred trees	six hundred trees

Extract 1.1: A sample answer from a pupil who failed to answer this question correctly.

Despite the average performance in this question, a total of 130,048 pupils, equivalent to 10.0 percent managed to answer all the items correctly. These pupils were able to write; the numbers in words, the Roman number into Arabic number, the place value of a digit in the given whole number and the given whole number in expanded form. Extract 1.2 shows the sample of the correct answer from one of the pupil.

Extract 1.2

No	Question	Working Space	Answer
1. (a)	Write the number 20,392 in words.	Twenty thousand three hundred and ninety two	Twenty thousand three hundred and ninety two
(b)	Write XXXIV in Arabic numbers.		
(c)	Write the place value of the underlined digit of the number <u>3</u> 402.	<div style="text-align: center;"> $\begin{array}{c} 3402 \\ \text{Thousands} \end{array}$ </div>	34 4 is in Hundreds
(d)	Write the following number in expanded form: 9536	$9000+500+30+6$	$9000+500+30+6$
(e)	The pupils planted 680 trees so as to conserve the school environment. Write the number of planted trees in words.	Six hundred and eighty	Six hundred and eighty

Extract 1.2: A sample answer of a pupil who managed to answer this question correctly.

2.2 Question 2:

- Write the next number in the following sequence of numbers: 1, 3, 5, 7, ____.
- Arrange the following numbers starting from the smallest to the largest: 20, 4, 12, 7, 16, 3, 10
- Write the missing number to complete the following sequence of Roman numbers: XXII, XXV, XXVIII, ____, XXXIV.
- Write the missing number in the following sequence: 36, 33, 30, ____, 24.

- (e) The frog jumped three steps with the same length until it reached 21m. If it jumped the fourth step of the same length as the previous steps, at what distance will it end up?

This question had five parts from the specific competence about the application on concept of patterns of numbers to solve problems in everyday life. The question assessed different skills in each part as follows part (a), (c) and (d), the pupils were required to identify and write the missing numbers in the given sequences. Part (b) assessed the pupils' skills on how to arrange the given numbers starting from the smallest to the largest and part (e) assessed the pupils ability to solve the given word problem by identifying and writing the unit of the fourth step from the given three steps.

The analysis of data shows that, the performance in this question was average since 745,488 pupils, equivalent to 57.3 percent scored from 4 to 10 marks. The rest of pupils, 555,480 equivalent to 42.7 percent had weak performance since they scored 0 or 2 marks. The percentage and scores of pupils in this question are presented in Figure 2.

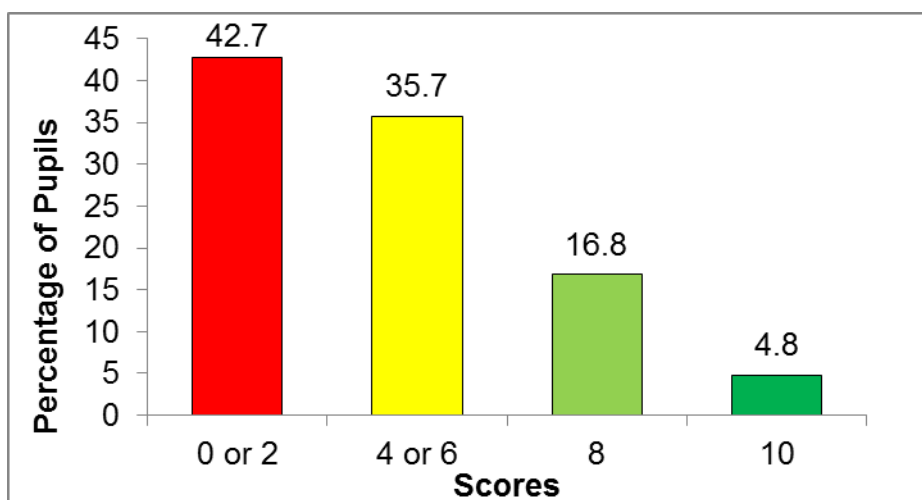


Figure 2: The percentage of pupils and respective scores for question 2.

Further analysis of data shows that, out of 555,480 pupils who had weak performance, 314,945 equivalent to 24.2 percent scored 0 mark.

These pupils lacked ability to identify the missing numbers in the sequences of numbers that were provided in parts (a), (c) and (d). In part (b), the pupils failed to understand that they were required to arrange the given numbers 20, 4, 12, 7, 16, 3 and 10 starting from the smallest to the largest number. Some of the the pupil grouped the numbers as; 20, 412, 716 and 310. So some of them arranged few of the numbers this indicates that they had insufficient knowledge on how to arrange numbers from the smallest to the largest as required.

Also in part (a), pupils failed to understand that in the given sequence; 1, 3, 5, 7, ____, the consecutive numbers, like 1 and 3, 3 and 5 or 5 and 7 differ by 2, whereby the next number is obtained by adding 2 to the previous number. So the missing number could be $7 + 2 = 9$, there were some pupils who wrote the missing number as 8 without considering the difference between the consecutive numbers in the given sequence. In part (c), the pupils failed to know that, in the given sequence; XXII, XXV, XXVIII, ____, XXXIV are numbers with a defined pattern, that is XXII and XXV or XXV and XXVIII differ by III, where the next number could be obtained by adding III to the previous number. This shows that the pupils lacked knowledge on how to combine the Roman numbers from ones into tens or hundreds.

On the other hand, the pupils who failed to answer part (d) correctly did not understand that in the sequence; 36, 33, 30, ____, 24 the numbers 36 and 33 or 33 and 30 differ by 3, where the next number could be obtained by subtracting 3 from the previous number, that is $30 - 3 = 27$.

In part (e), the pupils failed to solve the word problem that involved a sequence of numbers which differ by 7 meters from one step to another in order to get the next number after 21. The first step a frog jumped 7 meters, in the second step the frog reached 14 meters and in the third step it reached 21 meters, so in the fourth step it was supposed to have reached 28 meters. Extract 2.1 portrays a sample of incorrect answer provided by one of the pupil.

Extract 2.1

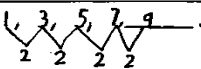
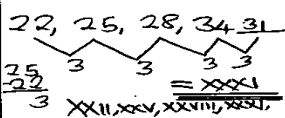
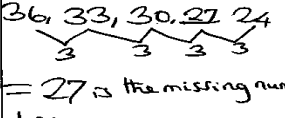
No	Question	Working Space	Answer
2. (a)	Write the next number in the following sequence of numbers: 1, 3, 5, 7, ____.	<u>the next 'number' is 8.</u>	<u>the next number is 8.</u>
(b)	Arrange the following numbers starting from the smallest to the largest: 20, 4, 12, 7, 16, 3, 10	20, 4, 12, 7, 16, 3, 10	20, 4, 12, 7, 16, 3, 10
(c)	Write the missing number to complete the following sequence of Roman numbers: XXII, XXV, XXVIII, ____, XXXIV.	22, 25, 28, 31, 34 3 3 3 3	38
(d)	Write the missing number in the following sequence: 36, 33, 30, ____, 24.	<u>The missing number is:</u> <u>27.</u>	<u>The missing number is 22.</u>
(e)	The frog jumped three steps of the same length until it reached 21m. If it jumped the fourth step of the same length as the previous steps, at what distance will it end up?	21 X3 63m	63m

Extract 2.1: A sample answer of a pupil who failed to answer this question correctly.

Further analysis shows that, out of 745,488 (57.3%) pupils who scored 4 to 10 marks in this question, 61,925 pupils, equivalent to 4.8 percent answered it correctly. These pupils had ability to identify the missing numbers in the given sequences, arrange the given numbers

from the smallest to the largest, and solve the word problem involving sequence of numbers correctly; Extract 2.2 shows a sample of the correct answers.

Extract 2.2

No	Question	Working Space	Answer
2. (a)	Write the next number in the following sequence of numbers: 1, 3, 5, 7, ____.		9
(b)	Arrange the following numbers starting from the smallest to the largest: 20, 4, 12, 7, 16, 3, 10	20, 4, 12, 7, 16, 3, 10 = <u>3, 4, 7, 10, 12, 16, 20.</u>	3, 4, 7, 10, 12, 16, 20.
(c)	Write the missing number to complete the following sequence of Roman numbers: XXII, XXV, XXVIII, __, XXXIV.	XXII, XXV, XXVIII, XXXI  = <u>XXXI</u>	XXXI is the missing number
(d)	Write the missing number in the following sequence: 36, 33, 30, __, 24.	36, 33, 30, <u>27</u> , 24  = 27 is the missing number	27 is the missing number
(e)	The frog jumped three steps of the same length until it reached 21m. If it jumped the fourth step of the same length as the previous steps, at what distance will it end up?	21m. $7 \times 3 = 21$ $7 \times 4 = 28m.$ $7m + 7m + 7m = 21m$ $21m + 7 = 28m$ = 28m.	28m.

Extract 2.2: A sample answer of a pupil who answered this question correctly.

2.3 Question 3:

(a) Add; $1715 + 263 =$

(b) Divide; $20 \overline{)600}$

(c) Mkombozi Primary School has 826 pupils. If the number of boys is 408, how many girls are there?

- (d) Multiply; $49 \times 53 =$
- (e) Kijo had 9,750 shillings. He gave his friend some money and remained with 3,250 shillings. How much money did he give his friend?

This question had five items from the specific competences of application of mathematical operations to solve problems. The question assessed different skills in each part where part (a) assessed the pupil's ability to add whole numbers with different number of digits, part (b) assessed the pupils' ability to perform division of whole numbers in which the divider has two digits and the dividend has three digits. Part (c) assessed the pupils' ability to perform subtraction by borrowing the whole numbers involving three digits from the given word problem. Part (d) assessed the pupils' ability to multiply whole numbers involving two digits and part (e) assessed the pupils' ability to apply the skills of subtraction on whole numbers.

The performance in this question was average because 761,206 pupils, equivalent to 58.5 percent scored from 4 to 10 marks. The 539,854 pupils equivalent to 41.5 percent had weak performance as their scores were either 0 or 2 marks. Figure 3 shows the percentage of pupils and scores for each category of performance.

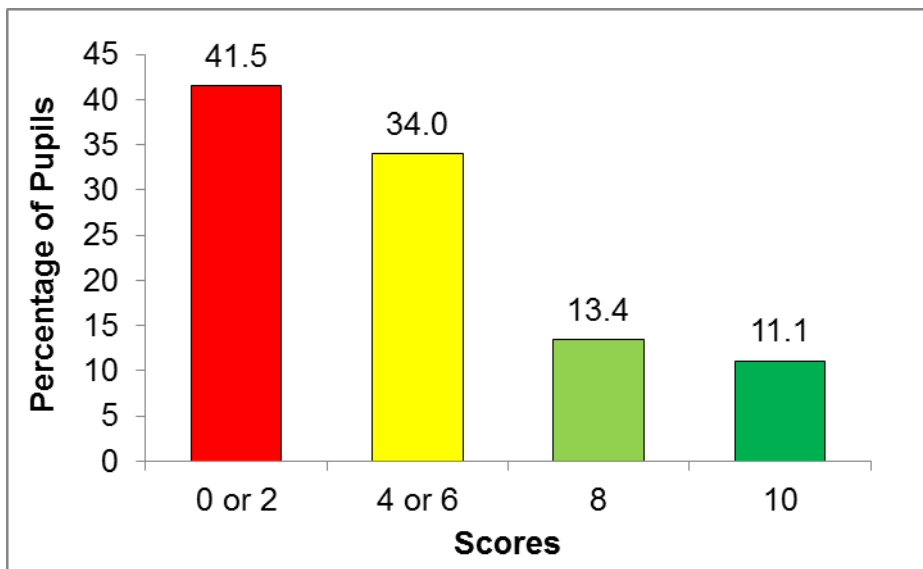


Figure 3: The percentage of pupils and marks they scored in question 3.

Further analysis of data shows that, 260,293 pupils, equivalent to 20.0 percent got 0 mark. These pupils failed to answer the question correctly due to different reasons as follows; in part (a), there were pupils who failed to get the correct answer due to insufficient knowledge and skills on adding numbers involving different number of digits. The pupils failed to arrange the digits in groups of ones, tens, hundreds and thousands before adding, some of the pupils wrote;

$$\begin{array}{r} 1\ 7\ 1\ 5 \\ +\ 2\ 6\ 3\ 0 \\ \hline \end{array}$$

instead of writing;

$$\begin{array}{r} 1\ 7\ 1\ 5 \\ +\ \ \ 2\ 6\ 3 \\ \hline \end{array}$$

In part (b), these pupils failed to get the correct answer as they lacked knowledge and skills of dividing whole numbers in which the divider has two digits and the dividend has three digits using long division method. Some pupils failed to divide 600 by 20 because they lacked skills on dividing whole numbers, where they were required to perform division as follows;

$$\begin{array}{r} 30 \\ 20 \overline{) 600} \\ -\ 60 \\ \hline 0 \end{array}$$

In part (c), the pupils failed to subtract whole numbers because they lacked skills on subtraction by borrowing. For example, the pupils did not comply to the given instructions, that is; instead of subtracting 408 from 826 they added the numbers. In part (d), the pupils failed to carry a group of tens when multiplying whole numbers involving two digits correctly, they failed to multiply 49 by 53. As a result ended with incorrect answers.

In part (e), these pupils failed to get the correct answer because of lack of skills to subtract whole numbers with four digits in the given word problem, they failed to recognize the requirements of the question, instead of subtracting the numbers given in the word problem, they just added those numbers. Extract 3.1 shows the answers of a pupil who failed to answer this question coorrectly.

Extract 3.1

No	Question	Working Space	Answer
3. (a)	Add; $1715 + 263 =$	$\begin{array}{r} 1715 \\ + 263 \\ \hline 1983 \end{array}$	4345
(b)	Divide; $20 \overline{)600}$	$\begin{array}{r} 20 \overline{)600} \\ 40 \\ \hline 200 \\ 20 \\ \hline 0 \end{array}$	20
(c)	Mkombozi Primary School has 826 pupils. If the number of boys is 408, how many girls are there?	$\begin{array}{r} 826 \\ + 408 \\ \hline 1234 \end{array}$	1234 girls
(d)	Multiply; $49 \times 53 =$	$49 \times 53 = 38$	38
(e)	Kijo had 9,750 shillings. He gave his friend some money and remained with 3,250 shillings. How much money did he give his friend?	$\begin{array}{r} 9750 \text{ sh} \\ - 3250 \text{ sh} \\ \hline 13000 \text{ shillings} \end{array}$	13000 shillings

Extract 3.1: A sample answer of pupil who failed to answer this question correctly.

On the other hand, out of 761,206 pupils who passed this question, 144,269 pupils, equivalent to 11.1 percent got all 10 marks in this question. These pupils had adequate knowledge and skills to; add

whole numbers with different amount of digits, perform division of whole numbers in which the divider has two digits and the dividend has three digits and perform subtraction by borrowing using the whole numbers involving three digits, multiply whole numbers involving two digits and apply techniques to subtract whole numbers involving four digits from the given word problem correctly as shown in Extract 3.2.

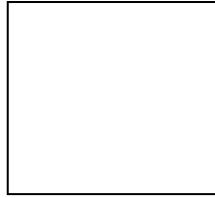
Extract 3.2

No	Question	Working Space	Answer
3. (a)	Add; $1715 + 263 =$	$\begin{array}{r} 1715 \\ + 263 \\ \hline 1978 \end{array}$	<u>1978.</u>
(b)	Divide; $20 \overline{)600}$	$\begin{array}{r} 30 \\ 20 \overline{)600} \\ \underline{60} \\ 00 \\ \underline{00} \\ 00 \\ \underline{00} \end{array}$	<u>30</u>
(c)	Mkombozi Primary School has 826 pupils. If the number of boys is 408, how many girls are there?	$\begin{array}{r} 826 \text{ pupils} \\ - 408 \text{ boys} \\ \hline 418 \text{ girls} \end{array}$ <p><u>There are 418 girls</u></p>	<u>There are 418 girls.</u>
(d)	Multiply; $49 \times 53 =$	$49 \times 53 =$ $\begin{array}{r} \times 49 \\ 53 \\ \hline 147 \\ 259 \\ \hline 2597 \end{array}$	<u>2597</u>
(e)	Kijo had 9,750 shillings. He gave his friend some money and remained with 3,250 shillings. How much money did he give his friend?	$\begin{array}{r} 9,750 \\ - 3,250 \\ \hline 6,500 \end{array}$	<u>= 6,500 shilling</u>

Extract 3.2: A sample answer of a pupil who answered this question correctly.

2.4 Question 4:

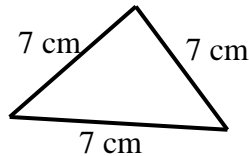
- (a) Write the name of the following figure which has equal length in all of its four sides.



- (b) The parts shown in the following figure have the same size. Write the fraction of the shaded part.



- (c) Find the perimeter of the following figure:



- (d) The perimeter of the triangle is 48 cm. If the length of the first side is 12 cm and the length of the second side is 20 cm, find the length of the third side.
- (e) The rectangle has the perimeter of 80 cm and the length of 25 cm. Find its width.

This question had five parts set from the specific competence of applying the concepts of shapes and figures to solve different problems; part (a) assessed the pupils' ability to identify the type of the given figures by using the properties of a given figure, part (b) assessed the pupils' ability to write the fraction of the shaded part in the given figure. Part (c) assessed the pupils' knowledge to find the perimeter of an equilateral triangle whose sides are 7 cm each, part (d) assessed the pupils' knowledge to find the length of the third side of the triangle when the perimeter is known to be 48 cm, the length of first side and that of the second side are 12 cm and 20 cm

respectively and part (e) assessed the pupils' ability to find the width of the rectangle whose perimeter is 80 cm and length is 25 cm.

The performance in this question was good because 923,865 pupils, equivalent to 71.0 percent scored marks from 4 to 10. However, 377,262 pupils, equivalent to 29.0 percent had weak performance since they scored 0 or 2 marks. Figure 4 shows the distribution of percentage of pupils and their corresponding scores in question 4.

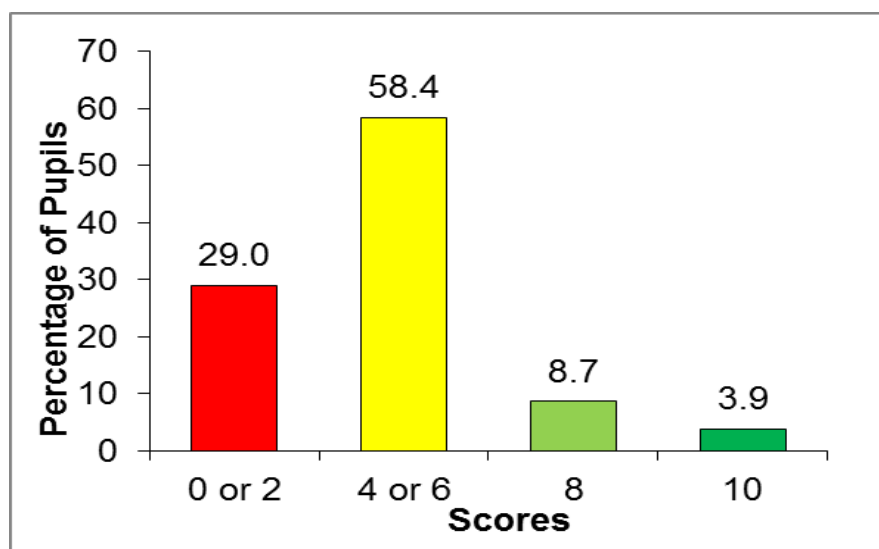
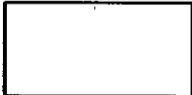
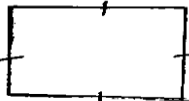

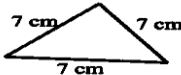
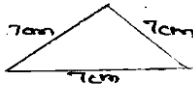
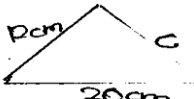
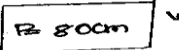


Figure 4: The percentage of pupils and their scores.

Further analysis shows that, out of 923,865 pupils who had good performance in this question, 50,545 pupils, equivalent to 3.9 percent scored all 10 marks. These candidates were able to; identify the properties of a square and wrote the correct name of the given figure, they also wrote the fraction of the shaded part in the given figure as 1 out of 4 equal parts, that is $\frac{1}{4}$ in part (b), found the perimeter of the equilateral triangle, that is, $7\text{cm} + 7\text{cm} + 7\text{cm} = 21\text{cm}$ in part (c), used the correct formula in finding the perimeter of the triangle, that is, perimeter = sum of the lengths of all three sides where the length of the third side is $(48 - (12 + 20))\text{cm} = 16\text{cm}$ in part (d) and used the correct formula for finding the perimeter of the rectangle, that is perimeter = $2(\text{length} + \text{width})$. Thus, $80 = 2(25 + \text{width})$, where in part

(e) the width is 15 cm. Extract 4.1 shows a sample answer of a pupil who answered this question correctly.

Extract 4.1

No	Question	Working Space	Answer
4.(a)	Write the name of the following figure which has equal length in all of its four sides. 	 A Square	A Square.
(b)	The parts shown in the following figure have the same size. Write the fraction of the shaded part. 	$\frac{1}{4}$ is the shaded part.	$\frac{1}{4}$ is the fraction of the shaded part.
(c)	Find the perimeter of the following figure: 	 $P = \text{Side} + \text{Side} + \text{Side}$ $7\text{cm} + 7\text{cm} + 7\text{cm} = 21\text{cm}$ $P = 21\text{cm}$	$P = 21\text{cm}$
(d)	The perimeter of the triangle is 48 cm. If the length of the first side is 12 cm and the length of the second side is 20 cm, find the length of the third side.	 $P = \text{Side A} + \text{Side B} + \text{Side C}$ $12\text{cm} + 20\text{cm} + C = 48\text{cm}$ $\begin{array}{r} 12 \\ 20 \\ \hline 32 \end{array} - \frac{48\text{cm}}{32\text{cm}} = \frac{16\text{cm}}{16\text{cm}}$ $C = 16\text{cm}$	<u>$C = 16\text{cm}$</u>
(e)	The rectangle has the perimeter of 80 cm and the length of 25 cm. Find its width.	 $P = L + W + L + W$ $25\text{cm} + W + 25\text{cm} + W = 80\text{cm}$ $2W + 50\text{cm} = 80\text{cm}$ $2W = 80\text{cm} - 50\text{cm}$ $2W = 30\text{cm}$ $\frac{2W}{2} = \frac{30\text{cm}}{2}$ $W = 15\text{cm}$	$W = 15\text{cm}$.

Extract 4.1: A sample answer of a pupil who managed to correctly answer all parts of this question.


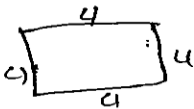

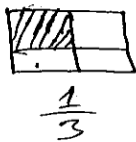
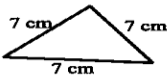
Despite the good performance in this question, the analysis of data shows that, out of 377,262 pupils, equivalent to 29.0 percent who scored 0 or 2 marks, 131,060 pupils, equivalent to 10.1 percent

scored 0 mark and 246,202 pupils, equivalent to 18.9 percent scored 2 marks. The pupils who failed to answer this question correctly lacked skills in different concepts that were tested as follows; in part (a), the pupils failed to know the properties of the given figure, they answered by looking at the appearance of the figure.

In part (b), the pupils failed to identify the numerator and denominator resulting from the shaded part of the figure, where some of the pupils wrote $\frac{1}{3}$ instead of $\frac{1}{4}$. In part (c), they lacked enough knowledge about the formula for finding the perimeter of the given triangle. Some of them wrote; $\text{perimeter} = (7\text{cm} + 7\text{cm} + 7\text{cm}) \times 2 = 21 \times 2\text{cm} = 42\text{cm}$ which is not a correct setp for getting the required answer. Instead, they were supposed to write; $\text{perimeter} = (7 + 7 + 7)\text{cm} = 21\text{cm}$. In part (d), the pupil did not know the relationship between the perimeter of a triangle and its sides, this is justified by some of the pupils who wrote $\text{perimeter} = 48\text{cm} + 12\text{cm} + 20\text{cm} = 80\text{cm}$. As a result, they failed to get the required length of the third side that could be obtained as follows; $48\text{cm} - (12 + 20)\text{cm} = 16\text{cm}$.

In part (e), the pupils did not know the formula for finding the perimeter of a rectangle, that is $\text{perimeter} = 2(\text{length} + \text{width})$, hence they ended up with incorrect result. The pupil wrote the answer as $80\text{cm} - 25\text{cm} = 55\text{cm}$ as seen in Extract 4.2.

Extract 4.2

No	Question	Working Space	Answer
4.(a)	Write the name of the following figure which has equal length in all of its four sides. 		16 cm
(b)	The parts shown in the following figure have the same size. Write the fraction of the shaded part. 		$\frac{1}{3}$
(c)	Find the perimeter of the following figure: 	$ \begin{aligned} P &= (h + w) \times 2 \\ P &= 7 \text{ cm} \\ &\quad 7 \text{ cm} \\ &\quad 7 \text{ cm} \\ &\quad \hline &\quad 21 \text{ cm} \\ \times &\quad 2 \\ &\quad \hline &42 \text{ cm} \end{aligned} $	42 cm
(d)	The perimeter of the triangle is 48 cm. If the length of the first side is 12 cm and the length of the second side is 20 cm, find the length of the third side.	$ \begin{aligned} P &= l \times l \\ P &= 48 \text{ cm} + 12 \text{ cm} + 20 \text{ cm} \\ &80 \text{ cm} \end{aligned} $	80 cm
(e)	The rectangle has the perimeter of 80 cm and the length of 25 cm. Find its width.	$ \begin{aligned} P &= l \times w \\ P &= 80 \text{ cm} - 25 \text{ cm} \\ &= 55 \text{ cm} \end{aligned} $	55 cm

Extract 4.2: A sample answer of a pupil who failed to answer this question correctly.

2.5 Question 5:

(a) Add; shs. 1940 + shs. 265=

(b) Subtract; shs. 3150 - shs. 1500=

(c) Multiply;

$$\begin{array}{r} \text{shs. } 3 \ 0 \ 0 \\ \times \quad \quad 2 \ 5 \\ \hline \end{array}$$

(d) Mariamu had shs. 8,650 in her pocket. Later on, she spent shs. 3,800. How much money did she remain with?

(e) How many 1,000 shilling notes are there in 10,000 Tanzanian shilling note?

This question had five parts which was about the application of mathematical operations on money, the question assessed various skills in each part where; part (a) assessed the pupils' ability to perform addition of numbers about money, part (b) assessed the pupil's ability to perform subtraction of numbers about money and part (c) assessed the pupils' ability to perform multiplication of numbers about money. Part (d) assessed the pupils' ability to use subtraction operation to solve the given word problem involving money and part (e) assessed the pupils' ability to use division operation to solve word problem about money.

The analysis of data shows that, the performance of pupils in this question was average since 766,321 pupils, equivalent to 58.8 percent scored from 4 to 10 marks. However, 534,727 pupils, equivalent to 41.1 percent had weak performance since they scored 0 or 2 marks. The performance of pupils in this question is shown in Figure 5.

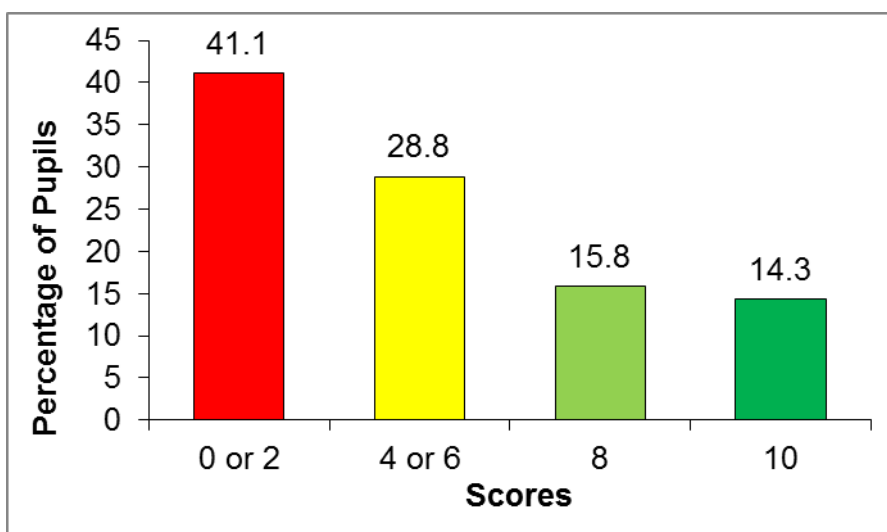


Figure 5: The percentage of pupils and marks they scored in this question.

Further analysis of data in this question shows that, out of 534,727 pupils who had weak performance, 321,499 pupils, scored 0 mark. These pupils failed to answer the question correctly due to different reasons where in part (a), they failed to get the correct answer due to lack of knowledge on performing addition of numbers about money. Some of the pupils failed to add the digits of the numbers 1,940 and 265 correctly while others subtracted shs. 265 from shs. 1,940 which was contrary to the given instructions. They lacked the skills to add by carrying, instead of carrying 1 from the group of hundreds into the group of thousands they carried 2. Some of them performed as follows;

$$\begin{array}{r}
 1\ 9\ 4\ 0 \\
 +\ 2\ 6\ 5 \\
 \hline
 3\ 2\ 0\ 5
 \end{array}$$

instead of writing;

$$\begin{array}{r}
 1\ 9\ 4\ 0 \\
 +\ 2\ 6\ 5 \\
 \hline
 2\ 2\ 0\ 5
 \end{array}$$

In part (b), the pupils failed to get the correct answer due to lack of knowledge and skills in subtraction. They did not know that after borrowing a group of tens from the place of thousands, the digit 3 is reduced by 1 to be 2 and hence $2 - 1 = 1$, they wrote;

$$\begin{array}{r} 3 \ 1 \ 5 \ 0 \\ - \ 1 \ 5 \ 0 \ 0 \\ \hline 4 \ 6 \ 5 \ 0 \end{array}$$

They performed addition instead of writing like this;

$$\begin{array}{r} 3 \ 1 \ 5 \ 0 \\ - \ 1 \ 5 \ 0 \ 0 \\ \hline 1 \ 6 \ 5 \ 0 \end{array}$$

In part (c), the pupils failed to get the correct answer due to lack of knowledge on multiplication. They ignored some important steps. For instance a step (5×3) when multiplying 300 by 25. Some of them wrote;

$$\begin{array}{r} 3 \ 0 \ 0 \\ \times \quad 2 \ 5 \\ \hline 0 \ 0 \\ + \ 6 \ 0 \ 0 \\ \hline 6 \ 0 \ 0 \ 0 \end{array}$$

instead of writing;

$$\begin{array}{r} 3 \ 0 \ 0 \\ \times \quad 2 \ 5 \\ \hline 1 \ 5 \ 0 \ 0 \\ + \ 6 \ 0 \ 0 \\ \hline 7 \ 5 \ 0 \ 0 \end{array}$$

In part (d), the pupils failed to get the correct answer due to lack of enough skills to use the concepts of subtraction to solve the given word problem. They failed to perform subtraction by borrowing and did not borrow a group of tens from the place value of thousands in order to get 16 before subtracting 8 in the place of hundreds. Some pupils wrote wrongly as follows;

$$\begin{array}{r} 8\ 6\ 5\ 0 \\ -\ 3\ 8\ 0\ 0 \\ \hline 5\ 2\ 5\ 0 \end{array}$$

They were required to write as follows;

$$\begin{array}{r} 8\ 6\ 5\ 0 \\ -\ 3\ 8\ 0\ 0 \\ \hline 4\ 8\ 5\ 0 \end{array}$$

In part (e), the pupils failed to get the correct answer due to lack of skills on the concepts of division of numbers when solving the given word problem. They did not understand the requirements of the question, because instead of dividing shs. 10,000 by shs. 1,000 to get the number of notes, that is $\frac{\text{shs. } 10,000}{\text{shs. } 1,000} = 10 \text{ notes}$, they added 10,000 and 1,000 to get 11000 Extract 5.1 justifies this situation.

Extract 5.1

No	Question	Working Space	Answer
5.(a)	Add; shs. 1940 + shs. 265 =	$\begin{array}{r} 1940 \\ + 265 \\ \hline 3205 \end{array}$	3205 shs
(b)	Subtract; shs. 3150 - shs. 1500 =	$\begin{array}{r} \text{shs } 3150 \\ - 1500 \\ \hline 1650 \end{array}$	4650 shs
(c)	Multiply; shs. 300 x 25 -----	$\begin{array}{r} \text{Shs } 300 \\ \times 25 \\ \hline 1500 \\ 6000 \\ \hline 6000 \end{array}$	6000 shs
(d)	Mariamamu had shs. 8,650 in her pocket. Later on, she spent shs. 3,800. How much money did she remained with?	$\begin{array}{r} \text{shs } 8,650 \\ - \text{shs } 3,800 \\ \hline \text{shs } 5,250 \end{array}$	Shs 5250
(e)	How many 1,000 shillings notes are in 10,000 Tanzania shillings note?	$\begin{array}{r} 10,000 \\ \div 1000 \\ \hline 10,000 \\ \times 1,000 \\ \hline 11,000 \end{array}$	11,000 shillings

Extract 5.1: A sample answer of a pupil who failed to answer this question correctly.

More analysis of data shows that out of 766,321 pupils who had an average performance, 186,373 pupils, equivalent to 14.3 percent were able to answer this question correctly and scored all marks. These pupils had enough knowledge to; perform addition, subtraction,

multiplication and division of numbers representing money and solve the given word problems involving money as shown in Extract 5.2.

Extract 5.2

No	Question	Working Space	Answer
5.(a)	Add; shs. 1940 + shs. 265 =	$\begin{array}{r} 1940 \\ + 265 \\ \hline 2205 \end{array}$	shs 2205
(b)	Subtract; shs. 3150 - shs. 1500 =	$\begin{array}{r} 3150 \\ - 1500 \\ \hline 1650 \end{array}$	shs 1650
(d)	Mariamamu had shs. 8,650 in her pocket. Later on, she spent shs. 3,800. How much money did she remained with?	$\begin{array}{r} \text{shs } 8650 \\ \text{shs } - 3800 \\ \hline \text{shs } 4850 \end{array}$ sh 4850	sh 4850
(e)	How many 1,000 shillings notes are in 10,000 Tanzania shillings note?	$\begin{array}{r} 10000 \\ 1000 \overline{)10000} \\ \underline{1000} \\ 0 \end{array}$ There are 10 notes of 1000 in 10000 note	There are 10 notes of 1000 in 10000 note of Tanzania

Extract 5.2: A sample answer of a pupil who managed to answer this question correctly.

3.0 ANALYSIS OF PUPILS' PERFORMANCE IN EACH COMPETENCE

The analysis of performance for each competence shows that, *Application of the Concept of Shapes and Figures to Solve Different Problems* is the only competence that had good performance. The competences about; *Application of the Concept of Numbers to Communicate in Different Contexts*, *Application of Mathematical*

operations on Money, Application of Mathematical operations on Numbers and Application of the Concept of Pattern of Numbers to Solve Problems in Everyday Life, both had average performance.

The analysis was done by computing the average percentage of the pupils basing on their performance in the question items of a particular competence. The analysis was based on the following standards; 67-100 percent is *good performance*, 34-66 percent is *average performance* and 0-33 percent is *weak performance*.

The pupils' performance for each question is shown in the *Attachment* of this report where the colours used represent the standards of performance. In the attachment; green colour represents good performance and yellow colour represents average performance.

4.0 CONCLUSION

In general, the performance of pupils in Mathematics subject Assessment in 2018 was 82.8 percent, which has increased by 13.1 percent compared to the performance of 2017 which was 69.7 percent.

The assessment results of Mathematics subject shows that, there was no competence that had weak performance in 2018. Further analysis of pupils' responses shows that, some of the reasons that contributed to pupils' failure to perform very good in the four questions which had average performance include; lack of enough competence to perform mathematical operations correctly and inability to apply various arithmetic facts and correct formulae in answering questions. Also failure to understand the requirements of the question and lack of adequate knowledge on mathematical language for solving word problems.

5.0 RECOMMENDATIONS

In order to improve the performance of Mathematics subject in future Standard Four Pupils in the National Assessment the following are recommended:

- (a) Teachers should timely implement the teaching and learning objectives right from Standard One by using various teaching

and learning aids available in their surroundings basing on the Mathematics syllabus for all competences.

- (b) Teachers should assess the pupils' ability regularly in every specific competence by providing enough exercises in order to improve their competence in answering questions.
- (c) Teachers should mark the pupils' exercises on time, for the purpose of giving feedback and device various mechanisms to assist the pupils according to their reading, writing and counting abilities.
- (d) Teachers should relate the content with the real life environment of the pupils during teaching process.

Attachment

SUMMARY OF ANALYSIS OF PERFORMANCE FOR EACH COMPETENCE IN TABULAR FORM (SFNA - 2018)

No.	Competences	Question Number	Number of Pupils with Good Performance	Percentage (%) of Pupils with Good Performance	Remarks on Performance
1.	Application of the Concept of Shapes and Figures to Solve Different Problems	4	923,865	71.00	Good
2.	Application of the Concept of Numbers to Communicate in Different Contexts	1	782,876	60.17	Average
3.	Application of Mathematical operations on Money	5	766,321	58.90	Average
4.	Application of Mathematical operations on Numbers	3	761,206	58.51	Average
5.	Application of the Concept of Pattern of Numbers to Solve Problems in Everyday Life	2	745,488	57.29	Average

