THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT ON THE PRIMARY SCHOOL LEAVING EXAMINATION (PSLE) 2023

MATHEMATICS

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MATHEMATICS

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FOREWORD

The purpose of the Candidates' Response Analysis Report on Primary School Leaving Examination (PSLE) in 2023 for Mathematics subject was to inform pupils, teachers, and other education stakeholders on how the candidates responded to the examination's questions.

The responses from candidates were analysed to determine the ability of the candidates in different competencies. The performance of the candidates in Mathematics subject was average.

However, the analysis shows that generally, mathematics subject had weak performance because 48.83 percent of 1,397,593 candidates passed the examination. This analysis shows that the candidates' poor performance was caused by several factors such as candidates' failure to: perform correctly mathematical operations, apply formulae for finding areas, circumference and volume of different figures; and formulate mathematical expressions or equations from word problems as well as converting different metric units of measurements. Thus, the recommendations provided will enable educational stakeholders to improve candidates' performance on the competencies to be examined in future.

The National Examinations Council of Tanzania believe that the candidates' performance in future mathematics examinations will be improved as a result of this feedback.

Lastly, the Council would like to express its gratitude to all of the examination officers and other professionals who contributed to the creation of this report.

Dr. Said A. Mohamed
EXECUTIVE SECRETARY

1.0 INTRODUCTION

The Primary School Leaving Examination for Mathematics paper was held on 13th September, 2023. In that sitting, a total of 1,397,593 candidates sat for the paper. The analysis of the examination results shows that 662,210 candidates (48.83%) passed. In 2022, a total of 718,273 (59.29%) of the candidates passed. Thus, the candidates' performance in PSLE 2023 decreased by 10.46 per cent when compared to that of 2022. The comparison of the candidates' performance in each grade for the year 2022 and 2023 is shown in Figure 1.
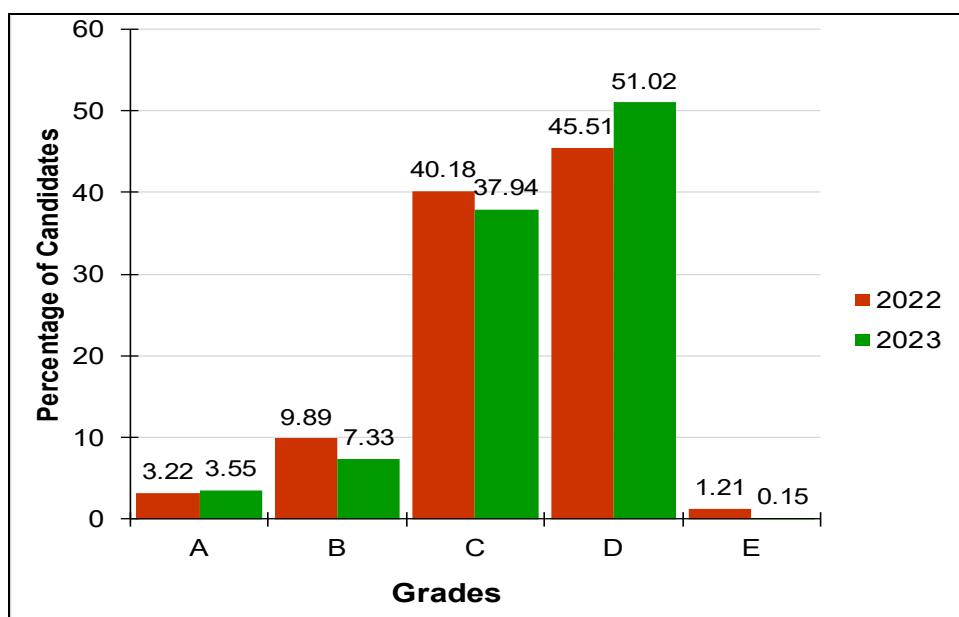
Figure 1: *Comparison of the candidates' performance grades for 2022 and 2023 examinations*

The Mathematics subject paper consisted of sections A and B, with a total of 45 questions. The candidates were required to answer all questions. The questions assessed the competencies on mathematical operations, figures and word problems. Section A had 40 multiple choice questions each carrying 01 mark. Section B had 5 short answer questions each carrying 02 marks. In Section A, the candidates were required to work out the answer in each question and shade the letter of the correct answer on the Optical Mark

Reader (OMR) forms. In Section B, the candidates were required to work out the answer on each question by showing the work in the space provided on the second side of the OMR form.

The candidates' responses in Section A were analysed and their performance was categorised in three classes according to the percentage of the candidates who correctly answered a particular question as follows: 60 - 100 per cent is categorised as good performance, 40 - 59 per cent as average performance and 0 - 39 per cent as weak performance. In Section B, the analysis of the candidates' performance was done by considering percentage of the candidates who scored 0 - 0.5, 1.0 and 1.5 – 2.0 marks.

In this report, Tables and Figures are included to illustrate the candidates' performance statistics. In Tables, the asterisk (*) is placed beside the correct answer for the multiple choice questions. Likewise, the word "*Others*" denotes the candidates who either chose more than one option or did not respond to the question. Also, the green, yellow and red colors in the figures represent good, average and weak performance, respectively.

Finally, the report shows the comparison of candidates' performance per topic in 2022 and 2023, and provides recommendations for the improvement of Mathematics performance in future.

2.0 ANALYSIS OF THE CANDIDATES' RESPONSES ON EACH QUESTION

The analysis was carried out in order to determine the candidates' strengths and weaknesses in answering the examination questions. The analysis in Section A, which included 40 multiple-choice questions, focused on the candidates' ability to determine and select the correct response as well as the contributing factors that led them to select the distractors. Additionally, the analysis in this section includes tables that show both the number and the percentage of candidates for each choice that they selected. Moreover, the analysis reveals the reasons for candidates' success or failure in

demonstrating their skills in the examined concepts in short response questions from section B, which included questions 41 to 45. The analysis in this part also includes examples of both the candidates' correct and incorrect answers to the questions.

2.1 Section A: Multiple Choice Questions

Question 1: Which is the next number in the following sequence?
29, 33, 37, 41, ____

A   43   B   45   C   47
D   42   E   46

This question assessed the candidates' competency in applying the concepts of patterns to solve real life problems. This question was answered by a total of 1,341,712 candidates. The candidates' performance on this question was good because 1,141,484 candidates equivalent to 84.16 per cent chose the correct option B as shown in Figure 2.
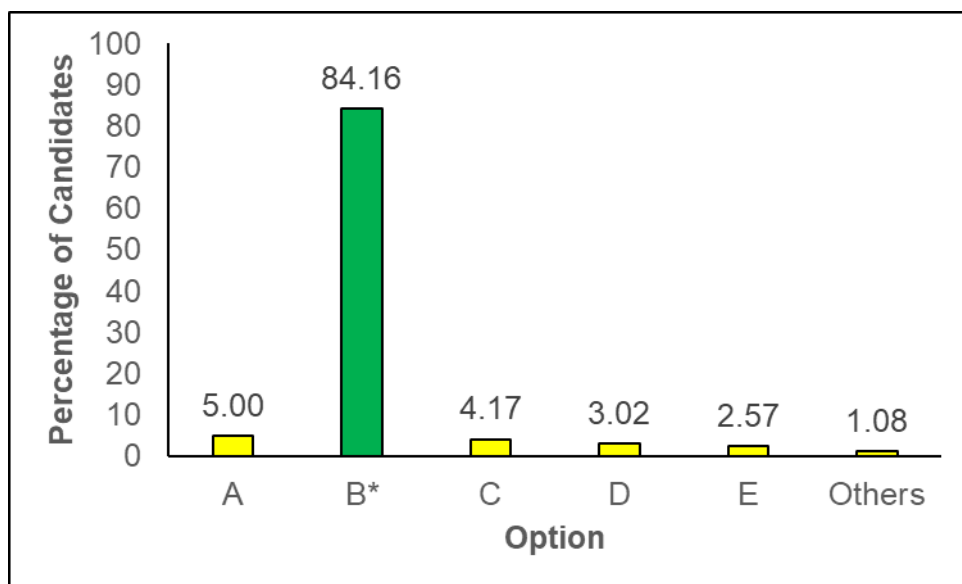
Figure 2: *Percentage of Candidates for each Option in Question 1*

The analysis of responses shows that, the candidates who chose the correct answer B "45" realized that the sequence of numbers was increasing by 4. Thus, they added 4 to 41 to get the next number which is 45.

On the other hand, 214,817 (15.84%) candidates chose distractor A, C, D or E. The candidates could not identify the correct number to be added to the previous number to get the next number. For example, candidates who chose distractor A "43" added 2 to 41 whereas those who chose distractor C "47" added 6 to 41. Moreover, the candidates who chose distractor D "42" added 1 to 41 whereas the candidates who chose distractor E "46" added 5 to 41.

In addition, 1.08 per cent of the candidates did not follow the given instructions.

Question 2: The length of a football pitch is 90.136 metres and the length of a netball pitch is 30.769 metres. Write the difference of the pitches lengths in two decimal places.

A	60.63	B	59.34	C	60.37
D	59.37	E	59.36.		

This question tested the candidates' competency on applying mathematical operations to solve problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak since 473,816 (34.93%) candidates opted for the correct option. Table 1 indicates the number and percentage of candidates in each option.

Table 1: Number and Percentage of Candidates in each Option

Option	A	B	C	D*	E	Others
Number of Candidates	192,745	102,128	277,019	473,816	283,961	26,632
Percentage	14.21	7.53	20.42	34.93	20.94	1.96

A total of 882,485 (65.07%) candidates chose distractor A, B, D or E due to lack of knowledge on subtraction of decimals. For instance, the candidates who chose distractor A or C lacked skills of

subtraction by borrowing. In this example, the candidates who chose distractor A did not subtract 1 from the ones place after borrowing 1 from ones place value and transferring it to the tenths place value. Also, some candidates failed to write the number they got in two decimal places. For example, candidates who chose distractor E wrote 59.367 as 59.36 instead of 59.37 in two decimal places.

On the other hand, the analysis shows that, the candidates who chose the correct answer D "59.37" were competent in subtracting decimals because they subtracted 30.769 from 90.136 correctly to get 59.367. Moreover, the candidates wrote 59.367 in two decimal places and got 59.37

Question 3: Akilimali fell down after running for $\frac{3}{4}$ of an hour. What percentage of time remained to complete an hour?

| A | 75% | B | 0.25% | C | 25% |
| D | 7.5% | E | 2.5% | | |

This question assessed the candidates' competency to apply mathematical operations in solving problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was average since 43.56 per cent of the candidates opted for the correct option C "25". Figure 3 indicates the percentage of candidates in each option.
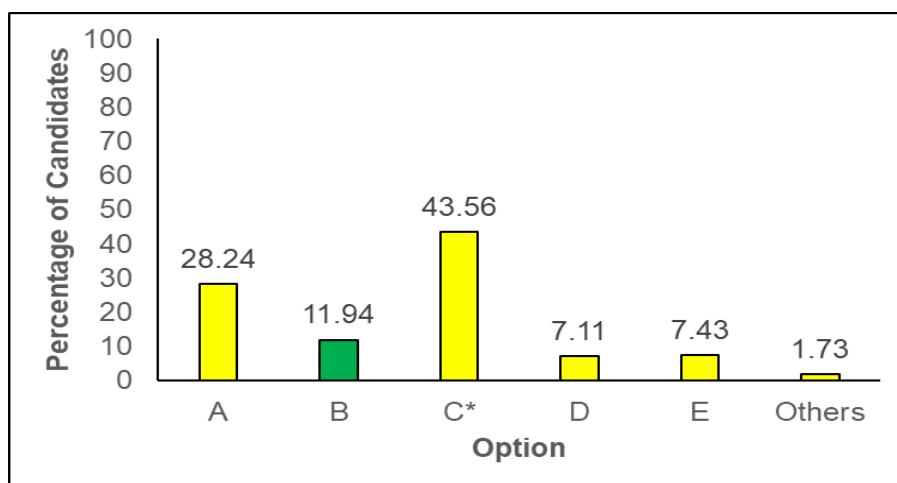
Figure 3: *Percentage of Candidates for each Option in Question 3*

The analysis of candidates' responses shows that, the candidates who chose the correct option C "25%" were able to convert the fraction $\frac{3}{4}$ into 75%. Then, they subtracted 75% from 100% to get 25%.

However, 765,506. (56.44%) candidates who chose the incorrect options A, B, D and E committed several errors in answering this question. For instance, the candidates who chose option A "75%" calculated the percentage of the time used to run instead of the remaining time by multiplying the fraction $\frac{3}{4}$ by 100 to get 75%. The candidates who chose option B calculated the fraction of the remaining time $(1-\frac{3}{4}=\frac{1}{4})$ but changed it to decimal number (0.25) instead of 25%. The candidates who chose option D calculated percentage of time spent on running as 7.5% instead of 75%. The candidates who chose option E calculated the percentage of the remaining time to get 2.5% instead of 25%.

In addition, 1.73 per cent of the candidates did not abide by the given instructions.

Question 4: Mr. Mandela has a farm of a circular shape with a diameter of 35 metres. If he decides to plant trees around the farm at a distance of 2.2 metres apart from each other, how many trees will he plant around the whole farm? (Use $\pi=\frac{22}{7}$).

    A   110   B   242   C 77
    D   51   E   50

The question tested the candidates' ability to apply skills to solve problems in the context of Mathematics. A total of 1,356,301 candidates attempted this question. The candidates' performance in this question was weak because 162,237 (11.96%) of the candidates chose the correct option E "50" as shown in Table 2.

Table 2: Number and Percentage of Candidates in each Option

Option	A	B	C	D	E*	Others
Number of Candidates	338,160	341,116	350,996	137,666	162,237	26,126
Percentage	24.93	25.15	25.88	10.15	11.96	1.93

Candidates who chose distractor A calculated the circumference of the circle. In addition, candidates who chose distractor B calculated the product of the circumference of the circle (110 m) and the distance between the trees (2.2 m). Candidates who chose distractor C calculated the product of the diameter of the circle (35 m) and the distance between two consecutive trees (2.2 m). In addition, the candidates who chose distractor D, calculated the circumference of a circle and divided by the distance between the consecutive trees and (2.2 m) then added 1 tree to get 51. The candidates interpreted that the trees are planted in a line instead of a circle.

Candidates who chose the correct option E "50" realized that the question was about the circumference of a circle. The candidates applied the formula of calculating the circumference of a circle which is circumference $= \pi d$. So, they calculated the circumference to obtain 110 m, then the candidates divided the circumference of the circle 110 m by the distance between two consecutive trees (2.2 m) and got 50.

Question 5: A doctor attended the patients in two days. On Monday, he attended 81 patients and on Tuesday he attended 69 patients. Which is the fraction of patients who were attended on Monday?

A $\dfrac{27}{50}$ B $\dfrac{23}{27}$ C $\dfrac{29}{50}$

D $\dfrac{24}{50}$ E $\dfrac{4}{27}$

The question assessed the candidates' competency in applying pattern skills to solve real-life problems. The data shows that

231,661 (17.08%) candidates chose the correct answer implying weak performance. The performance of Candidates in this question is shown in Figure 4.
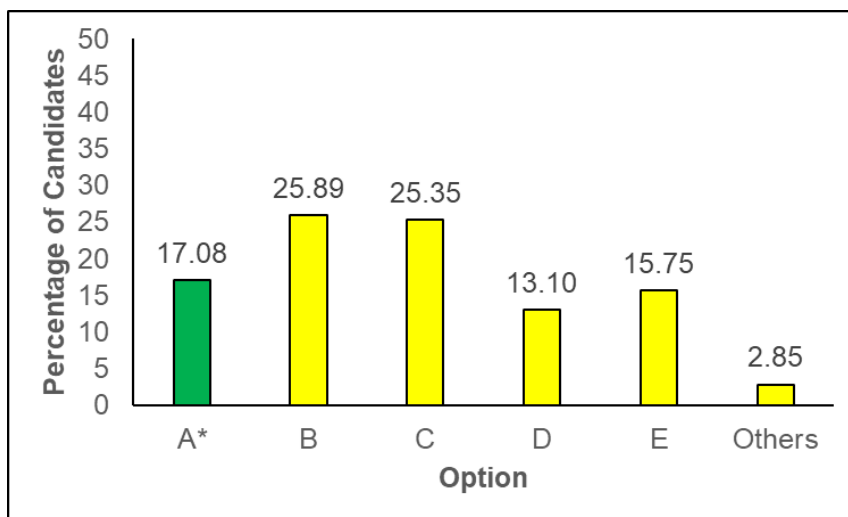
Figure 4: *Percentage of Candidates for each Option in Question 5*

Further analysis of data shows that a significant number of candidates (82.92%) chose distractor B, C, D or E as they lacked competence in solving a word problem on fractions. For instance, the candidates who chose distractor B " $\frac{23}{27}$ ", divided the number of patients attended on Tuesday (69) by the total number of patients who were attended. Also, the candidates who chose distractor E " $\frac{4}{27}$ ", divided the difference between the patients attended on Monday and Tuesday (12) by the number of patients attended on Monday (81). In addition, 2.84 percent of the candidates did not abide by the given instructions.

On the other hand, a few candidates (17.08%) were able to identify the fraction of patients who were attended on Monday among the fractions which were given. Those candidates correctly calculated the total number of patients attended on Monday (81) and Tuesday (69) to get 150 patients. Then, they divided the number of patients attended on Monday (81) by the total number of patients attended (150) and chose option A " $\frac{27}{50}$ " which was the correct answer.

Question 6: Rehema and Fadhili started at once counting oranges. Rehema counted loudly after every 5 oranges and Fadhili after every 9 oranges. Which first common number will they count loudly?

A 14	B 4		C 45
D 90	E 54		

The question tested the candidates' competency on applying the concepts of patterns to solve real life problems. A total of 1,356,301 candidates attempted this question and 501,321 (36.96%) opted the correct answer. Thus, the performance of candidates in this question was weak as shown in Table 3.

Table 3: Number and Percentage of Candidates in each Option

| Option	A	B	C*	D	E	Others
Number of Candidates	427,970	262,871	501,321	98,943	41,310	23,886
Percentage	31.55	19.38	36.96	7.30	3.05	1.76

The candidates failed to calculate the LCM of 5 and 9. For example, the candidates who chose distractor D calculated the LCM of 5 and 9 to get 90 and those who chose the distractor E got 54 instead of 45.

In addition, the analysis shows that the candidates who chose the correct answer C "45" had adequate knowledge on Lowest common multiple (LCM). Thus, they calculated the Lowest common multiple (LCM) of 5 and 9 to get 45. Other candidates did not realize that the question was about LCM. For example, candidates who chose distractor A calculated the sum of 5 and 9 while those who chose distractor B calculated the difference of 5 and 9.

Question 7: The tank of Baker's motorcycle was filled with 24 litres of oil. If it will travel a distance of 10 km and use $\frac{5}{8}$ of the oil, how many litres of oil will remain?

A 15	B 34		C 9
D 25	E 14		

The question tested the candidates' ability to use pattern skills to solve real-life problems in everyday life. The performance of candidates in this question is shown in Figure 5.
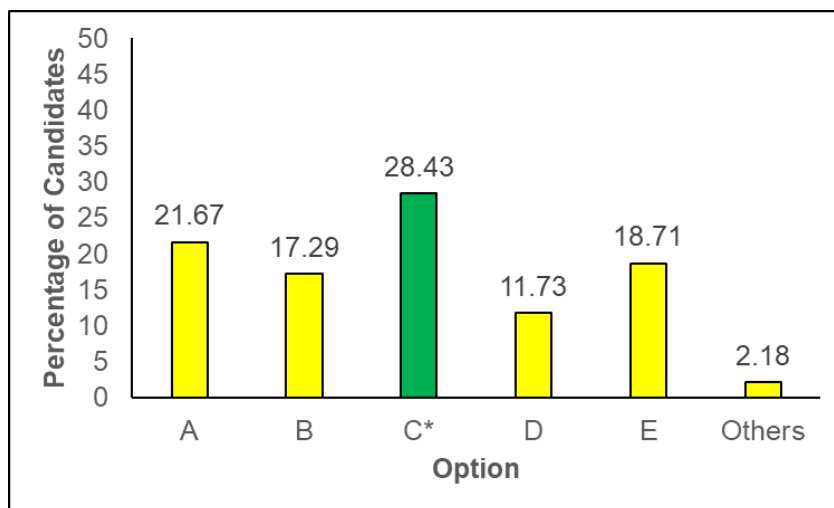
Figure 5: *Percentage of Candidates for each Option in Question 7*

As Figure 5 shows, 385,590 candidates (28.43%) chose the correct answer C "9" indicating weak performance. The weak performance was due to candidates' inability to use pattern skills in solving a real-life problem. Hence, they chose the distractor A, B, D or E. For instance, the candidates who chose distractor A "15 litres" calculated the amount of litres of oil consumed by the motorcycle to travel a distance of 10 km instead of litres of oil that remained in a tank. The candidates who chose distractor B added 24 to 10 to get 34 litres. and the candidates who chose distractor E "4 litres" subtracted 10 from 24 to get 14 litres of oil.

In addition, 2.18 percent of the candidates did not follow the given instructions.

The candidates who chose the correct option C "9" multiplied the fraction $\frac{5}{8}$ of fuel consumed in the motorcycle by the amount of fuel filled in the motorcycle (24 litres) to get 15 litres. Then, they subtracted 15 litres from 24 litres to determine the amount of fuel left in the tank.

Question 8: A bus has 23 seats, two of them are for the driver and conductor and $\frac{2}{3}$ the remaining seats are for the passengers. How many seats are empty in the bus?

A   21   B   14   C   16

D   7   E   9

This question assessed candidates' ability to use pattern skills to solve real-life problems. A total of 1,356,301 candidates answered this question and among them, 316,917 (23.37%) candidates chose the correct answer D as shown in Table 4.

Table 4: Number and Percentage of Candidates in each Option

Option	A	B	C	D*	E	Others
Number of Candidates	355,842	271,697	235,027	316,917	148,837	27,981
Percentage	26.24	20.03	17.33	23.37	10.97	2.06

The analysis of the candidates' responses indicated that the 316,917 (23.37%) candidates chose the correct option D "7". Those candidates subtracted the number of seats for the driver and conductor (2) from the total number of seats in the car (23) to get 21 seats left for passengers. Thus, they calculated $\frac{2}{3}$ of 21 and got 14 seats occupied by passengers. Finally, they subtracted 14 from 21 and got 7 seats that were not occupied by passengers.

Nevertheless, 1,039,384 (76.63%) candidates chose distractor A, B, C or E. The candidates who chose distractor A "21" calculated the number of seats remained after subtracting the conductor and driver seats. Other candidates who chose distractor B "14" calculated the number of seats occupied by passengers. Candidates who chose distractor C calculated the total number of seats occupied by the passengers, conductor and driver. Candidates who chose distractor E calculated the total number of seats for the driver and conductor as well as number of seats that were not occupied by passengers in the bus.

Question 9: Five pupils were given a task of listing all multiples of 6 between 30 and 60. Which list is correct?

    A   36,48,54,56   B 36,42,54,60   C 36,40,42,48

    D   36,48,54,60   E 36,42,48,54

This question tested the candidates' ability to apply the concepts of patterns, particularly multiples of a number to solve real life problems. The statistical data analysis shows that the candidates' performance was average as shown in Figure 6.
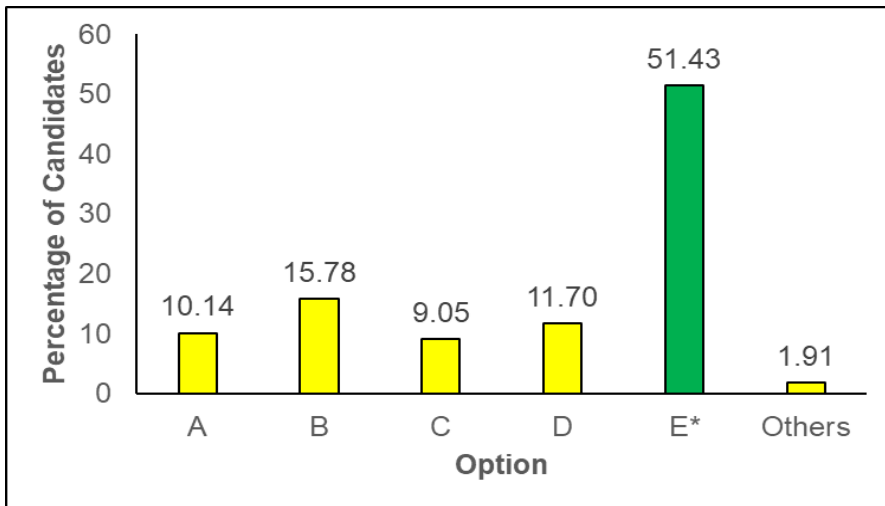
Figure 6: *Percentage of Candidates for each Option in Question 9*

In this question, 697,591 (51.43%) candidates who chose the correct option E were able to identify the list of whole numbers between 30 and 60 that are divisible by 6 to be 36,42,48 and 54.

However, 658,770 (48.57%) candidates chose distractor A, B, C or D. The candidates chose a list in which some numbers when divided by 6 produce an answer that is not a whole number (decimal or fraction). For example, the list in distractor A contains 56 which when divided by 6 produces $9\frac{1}{3}$. Similarly, distractor C consists of 40 which when divided by 6 produces $6\frac{2}{3}$. Distractor, B and D both consist of 60 which is not smaller than 60.

Moreover, 1.91 per cent did not abide by the demands of the question.

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Question 10: Ester calculated the product of all prime numbers between 80 and 90 correctly. Which one is the correct product?

A	7,387	B	7,378	C	7,367
D	7,373	E	7,396		

This question assessed the candidates' competency on applying the concepts of patterns to solve real life problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak because 425,480 (31.37%) candidates chose the correct answer as shown in Table 5.

Table 5: Number and Percentage of Candidates in each Option

| Option	A*	B	C	D	E	Others
Number of Candidates	425,480	268,653	256,219	199,697	169,213	37,039
Percentage	31.37	19.81	18.89	14.72	12.48	2.73

The candidates who chose the distractors B, C, D and E failed to correctly identify the correct the list of prime numbers between 80 and 90 which was the important step in determining the correct product.

On the other hand, the analysis of the candidates' responses shows that, the candidates who chose the correct answer A " 7,387 " correctly identified the prime numbers between 80 and 90 which were 83 and 89. They also correctly calculated the product of the listed numbers 83 and 89 to get got 7,387.

Question 11: Five groups listed all even numbers between 115 and 124. Which group listed the numbers correctly?

A 116, 120, 122, 124   B   116, 118, 120, 122
C 116, 119, 120, 122   D   116, 118, 120, 124
E 116, 120, 123, 124

This question assessed the candidates' competency in applying the concepts of patterns to solve real life problems. A total of 1,356,301 candidates attempted this question. The candidates' performance was good because 835,303. (61.59%) chose the correct option as shown in Figure 7.
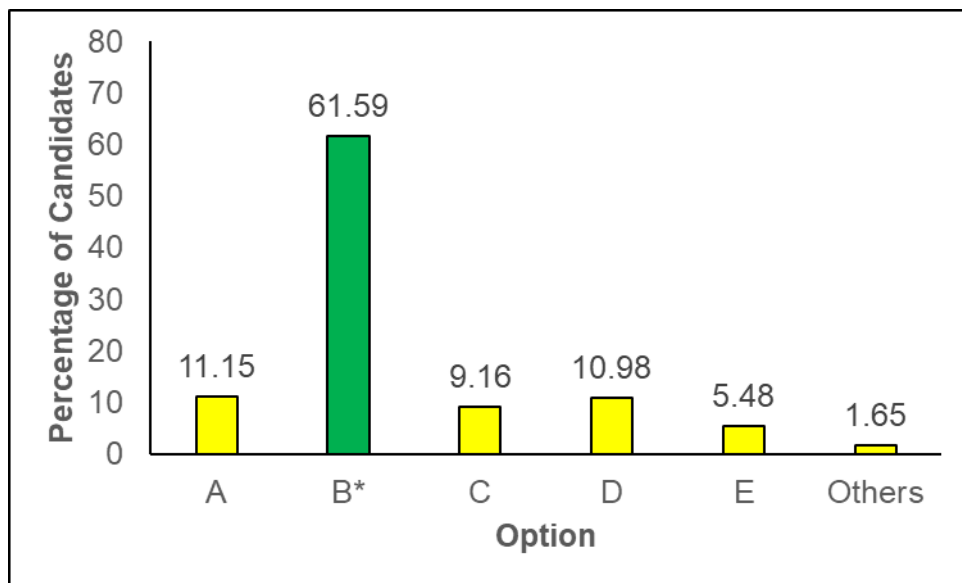
Figure 7: *Percentage of Candidates for each Option in Question 11*

The analysis of the candidates' responses shows that the candidates who chose the correct option B "116, 118, 120, 122" identified correctly the list of numbers between 115 and 124 which are divisible by 2.

In contrast, 520,998 candidates (38.41%) who chose distractors A, D and E selected the list which consisted of 124 contrary to the requirements of the question. Likewise, the candidates who chose distractors C selected the list that consisted of the odd number 119.

In addition, 1.65 percent of the candidates did not abide by the instructions of the question.

Question 12: The students were given an exercise of arranging the numbers 1.25, 20%, $\frac{1}{8}$, 0.15 and -3 in a descending sequence. Which sequence is correct?

A   1.25, $\frac{1}{8}$, -3, 0.15, 20%

B   -3, 1.25, 0.15, 20%, $\frac{1}{8}$

C   -3, 20%, 1.25, $\frac{1}{8}$, 0.15

D   1.25, 20%, 0.15, $\frac{1}{8}$, -3

E   1.25, -3, 20%, 0.15, $\frac{1}{8}$

This question tested candidates' competency in applying the concepts of patterns to solve real life problems. The candidates were required to convert the numbers provided in percentages into decimals in order to determine the correct sequence. A total of 1,356,301 candidates attempted this question. The data analysis shows that 472,837 candidates (34.86%) opted for the correct answer. This shows that the candidates had weak performance on this question. The number of candidates and their responses are shown in Table 6.

Table 6: Number and Percentage of Candidates in each Option

Option	A	B	C	D*	E	Others
Number of Candidates	199,215	274,757	284,788	472,837	97,046	27,658
Percentage	14.69	20.26	21.00	34.86	7.16	2.04

The analysis of the candidates' responses shows that, the candidates who opted for correct answer D "1.25, 20%, 0.15, $\frac{1}{8}$, -3" correctly converted 20% and $\frac{1}{8}$ into decimal to get 0.2 and 0.125 respectively. They also compared the values of the obtained number and identified the correct descending order which is 1.25, 0.2 ,0.15, 0.125 and -3.

On the other hand, 883,464 candidates (65.14%) who chose distractors A, B, C or E failed to identify the values of some listed

numbers thus, they opted the incorrect list. For example, candidates who chose distractor B and C mistakenly assumed that -3 is greater than the rest listed numbers but in reality this number is smaller than any positive number.

Question 13: Mwanahawa deposited 450,000 shillings in a bank for a period of 2 years and she got an interest of 27,000 shillings. What is the rate of interest given by the bank?

A   2%   B   3%   C   4%
D   5%   E   1%

The question assessed the candidates' competency in applying number relations to solve problems in different situations. The candidates' performance is presented in Figure 8.
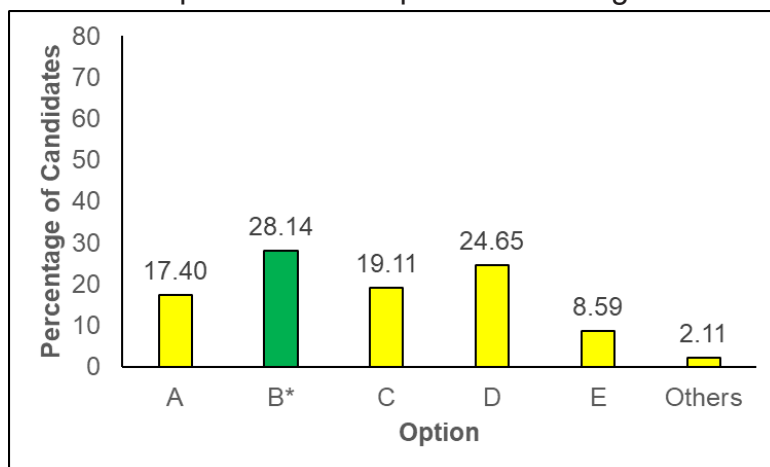
Figure 8: *Percentage of Candidates for each Option in Question 13*

As Figure 8 shows, 974,620 (71.86%) candidates chose the incorrect options A, C, D or E. These candidates failed to apply the formula $I = \dfrac{PRT}{100}$ to find the interest which was provided by the bank. For example, the candidates who chose distractor A "2%" believed that the duration of 2 years equate to the amount of interest provided by the bank in percentage. The candidates who chose distractor C "4%" calculated the product of time (2 years) and rate (2%) to get 4%. The candidates who opted distractor D "5%" calculated the sum of the rate of interest (3%) and the period of 2 years to get 5%. The candidates who chose distractor E "1%" divided the given period of 2 years by 2 to get 1%. This indicates

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that, the candidates had insufficient knowledge on simple interest. Moreover, 2.11 per cent of the candidates did not follow the given instructions.

Despite the weak performance, 381,681 candidates (28.14%) chose the correct answer B "3%". The candidates had adequate understanding of the simple interest formula as they correctly entered P = 450,000, T = 2 years and I = 27,000 into the formula $I = \dfrac{PRT}{100}$ to get the interest provided by the bank equal to 3%.

Question 14: Ushindi primary school has a total of 960 pupils. If there are 540 girls, what fraction represents the number of boys?

A $\dfrac{9}{16}$ B $1\dfrac{7}{16}$ C $\dfrac{7}{16}$

D $\dfrac{3}{4}$ E $1\dfrac{9}{16}$

The question assessed the candidates' competency in applying number relations to solve problems in different context. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak because 410,960 (30.30%) candidates chose the correct option as shown in Table 7.

Table 7: Number and Percentage of Candidates in each Option

| Option	A	B	C*	D	E	Others
Number of Candidates	190,679	274,087	410,960	239,845	208,837	31,893
Percentage	14.06	20.21	30.30	17.68	15.40	2.35

The analysis of candidates' responses shows that, 410,960 candidates (30.30%) who chose the correct option C "$\dfrac{7}{16}$" calculated the number of boys by subtracting the number of girls (540) from the total number of pupils in school (960) to get 420. Candidates also calculated the fraction of boys by dividing the number of boys obtained by the total number of pupils $\dfrac{420}{960}$ then simplified to obtain $\dfrac{7}{16}$.

However, 945,341 (69.70%) candidates chose distractor A, B, D or E because they lacked knowledge on interpreting word problems. Candidates who opted distractor A calculated the fraction of girls instead of boys. Likewise, candidates who opted distractor D calculated the square root of the fraction of girls $\dfrac{9}{16}$ to get $\dfrac{3}{4}$.

Likewise, candidates who selected distractor B or E used the number of girls or boys twice. For instance, candidates who chose distractor B calculated the fraction representing boys by subtracting 540 from 960 to get 420; added 420 to 960 to get 1380. Then, they divided 1380 by 960 to get $1\dfrac{7}{16}$.

Question 15: Mariam's mother had 100 kilogram of rice. She gave Elisha $\dfrac{3}{10}$, Mwajuma $\dfrac{1}{2}$ and Isaac $\dfrac{1}{5}$ of all amount of rice. How many kilograms did a person with a small share get?

A 30	B 40	C 70
D 20	E 10	

The question assessed the candidates' competency in applying the number relations to solve problems in different situations. In this question, 493,432 candidates (36.4.38%) chose the correct answer D "20". Therefore, the performance of candidates in this question was weak as shown in Figure 9.
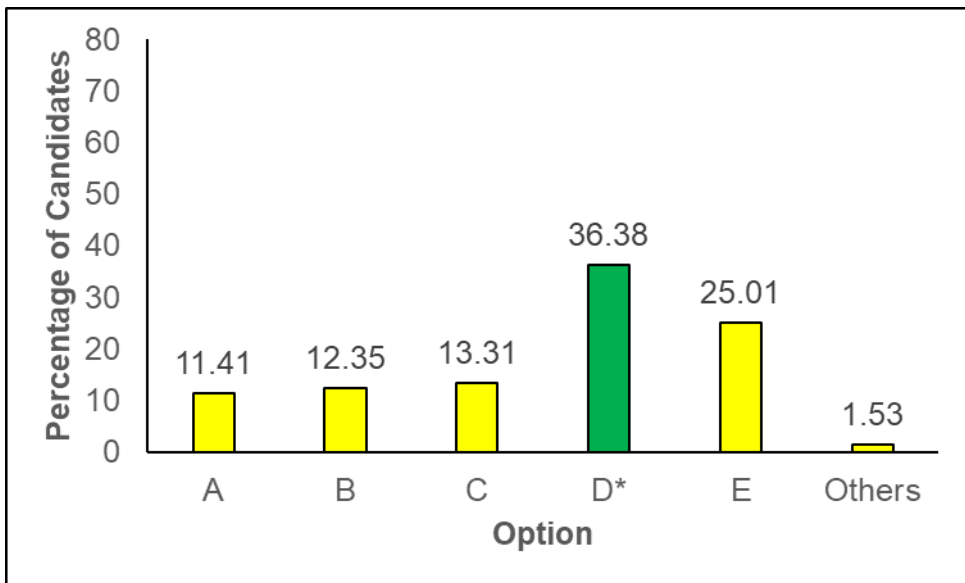
Figure 9: *Percentage of Candidates for each Option in Question 15*

As Figure 9 shows, a total of 862,869 (63.62%) chose the incorrect options A, B, C, or E. These candidates were unable to multiply the given fractions with 100 kg of rice so as to identify a small share of rice. For instance, the candidates who chose distractor A calculated the share which was given to Elisha. The candidates who opted distractor C calculated the sum of shares provided to Mwajuma and Isihaka.

Moreover, 1.53 per cent of the candidates did not follow the given instructions.

Conversely, the candidates who chose the correct answer D "20" multiplied correctly the given fractions by 100 kg to get the amount of rice given to Elisha, Mwajuma and Isihaka equal to 30 kg, 50 kg and 20 kg respectively. Then, they compared the amount of rice for each individual and realized that the smallest share is 20 kg.

Question 16: Musa ate $\frac{1}{9}$ of bread and Amina ate $\frac{1}{8}$ of the same bread. What fraction of the bread did they remain with?

A $\quad\frac{55}{72}$ 　　　　 B $\quad\frac{2}{17}$ 　　　　 C $\quad\frac{15}{17}$

D $\quad\frac{17}{72}$ 　　　　 E $\quad\frac{15}{72}$

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The question assessed candidates' competency in applying the concepts of patterns to solve real life problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak since 222,090 candidates (16.37%) opted for the correct option. Table 8 indicates the number and percentage of candidates in each option.

Table 8: Number and Percentage of Candidates in each Option

Option	A*	B	C	D	E	Others
Number of Candidates	222,090	549,228	192,773	260,325	109,080	22,805
Percentage	16.37	40.49	14.21	19.19	8.04	1.68

The analysis shows that, candidates who chose the correct answer A " $\frac{55}{72}$ " calculated the total fraction of the bread consumed by Musa ($\frac{1}{9}$) and Amina ($\frac{1}{8}$) to get $\frac{17}{72}$. The candidates were aware that, the whole thing is represented by 1. Thus, they computed the difference between 1 and the total bread consumed ($\frac{17}{72}$) to obtain the remaining fraction of bread, which is represented by $\frac{55}{72}$.

On the other hand, 1,134,211 (83.63%) candidates chose distractor B, C, D, or E. The candidates who chose distractor D " $\frac{17}{72}$ " calculated the fraction of the bread that Moses and Amina consumed instead of the remaining fraction of the bread. Some of the candidates lacked skills on how to add and subtract fractions. For example, the candidates who chose distractor B " $\frac{2}{17}$ " made a mistake in adding $\frac{1}{9}$ and $\frac{1}{8}$ where they calculated the sum of the numerator (1+1) and the denominator (9+8) to get $\frac{2}{17}$. Moreover, the candidates who chose distractor C " $\frac{15}{17}$

$\frac{2}{17}$ then they incorrectly

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computed the difference between 1 and $\frac{2}{17}$ to get the remaining fraction of the bread.

Question 17: Sabrina and Salma got a profit from their joint business. Sabrina received $\frac{3}{5}$ of the profit and Salma received 0.4 of the profit. Find difference of the amount received in percentage?

A 60%   B 40%   C 30%
D 80%   E 20%

This question assessed candidates' ability to apply the concepts of patterns to solve real life problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak since 475,821 candidates (35.08%) opted for the correct option. Figure 10 indicates the number and percentage of candidates in each option.
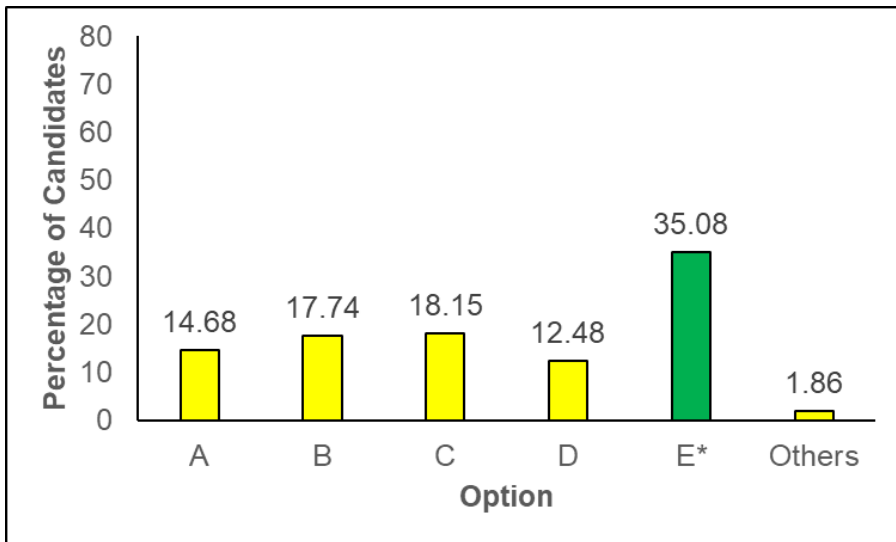
Figure 10: *Percentage of Candidates for each Option in Question 17*

Analysis of data shows that 880,480 candidates (64.92%) chose the incorrect options A, B, C or D. The candidates were unable to find the difference of the amount received in percentage. For instance,

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the candidates who chose distractor A "60%" calculated the percentage of profit that Sabrina got. Also, those who chose distractor B "40%" calculated the percentage of profit that Salma got. Moreover, the candidates who chose distractor C "30%" calculated the percentage of profit that Sabrina got and then divided that percentage by 2 to get 30%.

In addition, 1.86 per cent of the candidates did not follow the given instructions.

On the other hand, the candidates who chose the correct answer E "20%" calculated the difference between $\frac{3}{5}$ and 0.4 to get 0.2 or $\frac{1}{5}$.

Then, they converted the difference into a percentage to get 20%.

Question 18: Upendo travelled at a distance of $16\frac{3}{4}$ kilometres by bicycle and the remained part she walked on foot. If she travelled at a distance of $18\frac{1}{2}$ kilometres, at what distance did she walk on foot?

A $2\frac{3}{4}$ km   B $1\frac{3}{4}$ km   C $3\frac{1}{4}$ km

D $2\frac{1}{4}$ km   E $1\frac{1}{2}$ km

The question tested the candidates' competency in applying mathematical operations to solve real-life problems. A total of 1,356,301 candidates attempted this question. The candidates' performance on this question was weak since 154,968 candidates (11.43%) opted for the correct option. Table 9 indicates the number and percentage of candidates in each option.

Table 9: Number and Percentage of Candidates in each Option

Option	A	B*	C	D	E	Others
Number of Candidates	286,653	348,661	235,731	307,922	154,968	22,366
Percentage	21.13	25.71	17.38	22.70	11.43	1.65

The candidates who chose distractor A " $2\frac{3}{4}$ km ", calculated first

$18-16=2$ and added $\frac{3}{4}$ to get $2+\frac{3}{4}=2\frac{3}{4}$. The candidates who chose

distractor C " $3\frac{1}{4}$ km" added the sum of $\frac{3}{4}$ and $\frac{1}{2}$ to the difference of

18 and 16 " $18-16+\left(\frac{3}{4}+\frac{1}{2}\right)=3\frac{1}{4}$ ". The candidates who chose

distractor D " $2\frac{1}{4}$ km " added the difference of $\frac{3}{4}$ and $\frac{1}{2}$ to the

difference of 18 and 16 " $18-16+\left(\frac{3}{4}-\frac{1}{2}\right)=2\frac{1}{4}$ ". Moreover, the

candidates who chose distractor E " $1\frac{1}{2}$ km" subtracted $\frac{1}{2}$ from the

difference of 18 and 16 " $18-16-\left(\frac{1}{2}\right)=1\frac{1}{2}$ ".

In contrast, the candidates who chose the correct answer B

" $1\frac{3}{4}$ km " calculated the difference between $18\frac{1}{2}$ kilometres and $16\frac{3}{4}$

kilometres .

Question 19: Uhuru Primary School had 80 cattle. Last year the school decided to sell $\frac{5}{8}$ of the cattle. How many cattle did the school remain with?

A	50	B	48	C	32
D	10	E	30		

The question assessed candidates' competence in applying mathematical operations to solve word problems involving fractions. In this question, a total of 1,356,301 candidates attempted the

question and 14,228 candidates (1.74%) did not answer the question. Amongst 279,128 candidates (20.58%) chose the correct answer, thus the candidates' performance on this question was weak as shown in Figure 11.
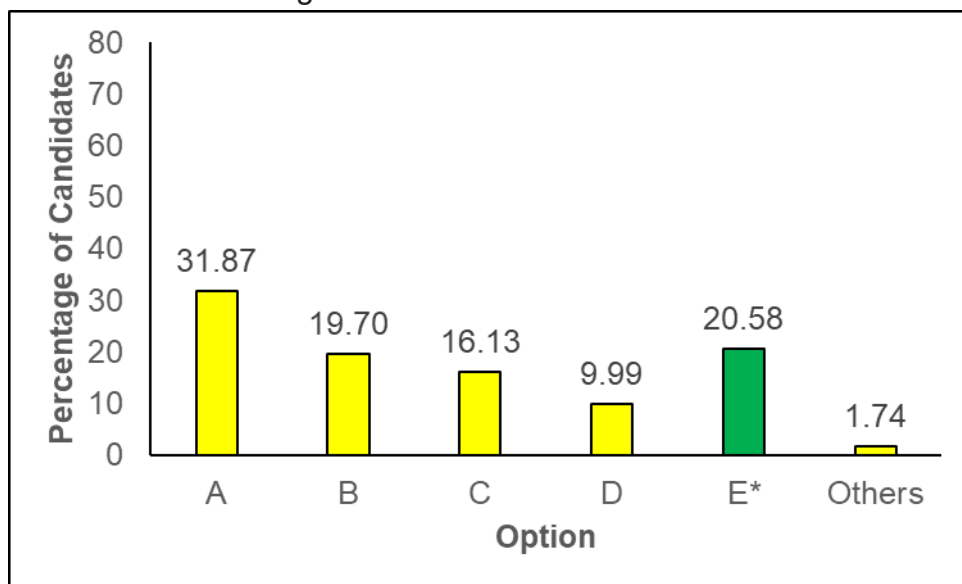
Figure 11: *Percentage of Candidates for each Option in Question19*

Data shows that, 1,077,173 (79.42%) candidates chose the incorrect option. Those candidates were unable to identify the fraction of cattle that remained at school. For instance, the candidates who chose distractor A calculated the number of cattle which were sold i.e. $\frac{5}{8} \times 80 = 50$. The candidates who opted for C or D misinterpreted the question contrary to the demands of the question and had insufficient computation skills in working with mathematical operations and therefore they ended up getting incorrect answers.

On the other hand, the candidates who chose the correct answer E '30' multiplied correctly the fraction $\frac{5}{8}$ by the total number of cattle in the school (80) to get 50. Then, they subtracted 50 cattle from 80 cattle to get the number of cattle the school remained with which is 30.

Question 20: An electric company uses 5,500 litres and 760 milliliters of diesel a day to produce an adequate amount of electricity needed at Wazalendo village. How much diesel should be used in February of a short year to satisfy the needs of the village?

A   154,021 litres and 280 millilitres
B   170,523 litres and 560 millilitres
C   165,022 litres and 800 millilitres
D   154,021 litres and 250 millilitres
E   159,522 litres and 40 millilitres

This question tested candidates' ability to apply the relationship between numbers and objects. A total of 1,356,301 candidates performed this question and 370,884 candidates (27.35%) opted for the correct answer A, thus the candidates' performance on this question was weak as shown in Table 10.

Table 10: Number and Percentage of Candidates in each Option

Option	A*	B	C	D	E	Others
Number of Candidates	370,884	293,522	325,527	193,639	144,466	28,263
Percentage	27.35	21.64	24.00	14.28	10.65	2.08

The analysis shows that, 985,417 (72.65%) candidates who chose distractor B, C, D or E failed to determine the number of days in February for a short year, thus getting an incorrect answer. For example, the candidates who chose distractor B interpreted February as having 31 days, while those who chose distractor C interpreted February as having 30 days. Likewise, the candidates who chose distractor E interpreted February in a leap year as having 29 days, which is the number of days in February for a non-leap year.

In addition to that, candidates who chose distractor D lacked computation skills, thus they got the amount of diesel used in February of a short year by calculating the product of number of days in February (28 days) and the amount of diesel used in one day (5500 litres and 760 millilitres) and obtain 154,021 litres and 250 millilitres of diesel.

On the other hand, 370,884 candidates (27.35%) chose the correct option A '154,021 litres and 280 correctly identified that February has 28 days, so they calculated the product of 28 days and the amount of diesel consumed per day (5500 litres and 760 millilitres) and got 154,021 litres and 280 millilitres of diesel.

Question 21:   Juma is shorter than Amina by 0.32 metres. If the height of Amina is 1.51 metres, what is the height of Juma?

A   1.83 m   B   1.29 m   C   1.81 m
D   1.19 m   E   1.18 m

This question assessed the candidates' competency to apply mathematical operations to solve problems in different context. A total of 1,356,301 candidates attempted this question. The analysis shows that 458,700 (33.82%) candidates, chose the correct answer D, thus the candidates' performance on this question was weak as shown in Figure 12.
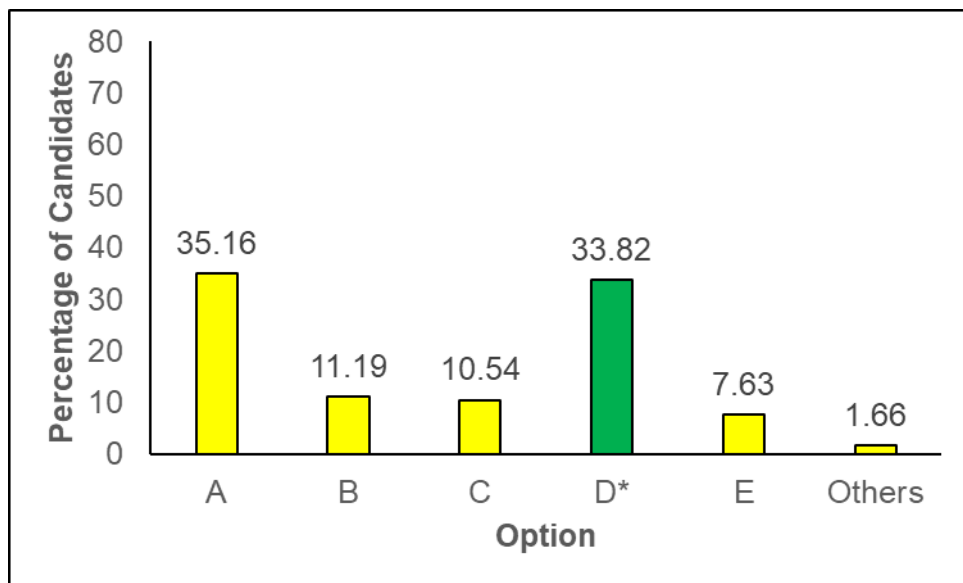
Figure 12: *Percentage of Candidates for each Option in Question 21*

The statistical analysis of data shows that, 897,601 candidates(66.18%) chose distractor A, B, C or E. The candidates could not understand the requirement of the question and lacked computational skills on units of lengths. For example, the candidates who chose distractor A calculated the height of Juma by adding the height of Amina (1.51 meters) and the difference in their height which was 0.32 meters to get 1.83 meters. The candidates who opted for distractor B had an understanding on how to calculate the height of Juma but lacked knowledge of subtracting decimal numbers by borrowing in the decimal part. Likewise, the candidates who chose distractor C or E had insufficient skills on subtracting decimal numbers.

On the other hand, the candidates who chose the correct option D '1.19m' calculated Juma's height, by subtracting 0.32 metres from the height of Amina (1.51 meters) to get 1.19 meters.

Question 22: A father bought 57 sacks of beans and each sack weighed 90 kilograms. What was the cost of all sacks of beans if he bought each kilogram for 380 shillings?

A   sh 40,040   B   sh 1,949,400
C   sh 34,200   D   sh 21,660
E   sh 55,860

The question assessed candidates' competence in applying mathematical operations to solve real-life problems. The analysis shows that 238,520 candidates (17.59%) chose the correct answer B, thus the candidates' performance on this question was weak as shown in Table 11.

Table 11: Number and Percentage of Candidates in each Option

Option	A	B*	C	D	E	Others
Number of Candidates	154,002	238,520	392,804	331,788	211,070	28,117
Percentage	11.35	17.59	28.96	24.46	15.56	2.07

The candidates who chose option B "1,949,400" calculated the cost of one sack by multiplying the price per sack (sh 380) by the weight of one sack (90 kg) and obtained (sh 34,200). Then, the candidates calculated the product of the cost of one sack (sh. 34,200) and the number of sacks (57) and found the cost of all sacks to be sh. 1,949,400.

On the other hand, 1,117,781 (82.41%) candidates chose the distractor A, C, D or E, candidates who chose distractor C "sh. 34,200", calculated the cost of one sack of beans instead of the cost of all 57 sacks. Candidates who chose distractor D assumed that sh. 380 is the cost of one sack instead of one kilogram. So the candidates calculated the product of 57 sacks and the cost of one kilogram (380 shs) and got 21,660 shs. The candidates who chose the incorrect option E (sh 55,860) failed to determine the total weight of all sacks because they calculated the sum of the number of sacks (57) and the weight of one sack (90 kg) to get 147. As a result of these mistake, they found the cost of all sacks to be 55,860 shs. after calculating the product of 147 and 380 shs.

Question 23: Jane's income for the year 2019 was 42,000,000 shillings. She used 8,500,000 shillings to pay school fees for her children, 12,000,000 shillings to pay for construction expenses and 10,000,000 shillings for personal expenses. If she saved the remained amount, how much money did she save?

    A   Sh. 11,500,000   B   Sh. 30,000,000
    C   sh. 35,500,000   D   sh. 3,500,000
    E   sh. 72,000,000

The question assessed the candidates' competency in applying number relations to solve problems in different situations. A total of 1,356,301 candidates attempted this question. Amongst 579,449 (42.7%) candidates chose the correct answer A. Thus, the performance on this question was average as shown in Table 11:

Table 12: Number and Percentage of Candidates in each Option

Option	A*	B	C	D	E	Others
Number of Candidates	579,449	173,282	198,352	165,165	215,541	24,512
Percentage	42.7	12.8	14.6	12.2	15.9	1.8

The analysis of the candidates' responses shows that the candidates who chose the correct answer A "Sh. 11,500,000" correctly calculated the total expenditure of Jane and obtained Sh.30,500,000. Thereafter, subtracted it from the Jane's annual income to obtain sh. 11,500,000.

Nevertheless, 776,852 (57.28%) candidates who chose incorrect answers B, C, D or E had insufficient skills in solving a word problem on selling and buying various commodities and service. For instance, the candidates who chose distractor B subtracted the amount spent on construction expenses sh. 10,000,000 from Jane's income to get sh. 30,000,000. The candidates who chose distractor D subtracted the amount used in paying school fees from the amount spent on construction expenses to get sh. 3,500,000.

Question 24: Muungano group had 8 members. They did a business and got a profit of 8,592,000 shillings. If they divided the profit equally among themselves, how much shillings did each one get?

    A   sh 1,407,000   B   sh 1,704,000
    C   sh 174,000   D   sh 1,074,000
    E   sh 1,174,000

This question assessed candidates' ability to apply Mathematical operations to solve problems. A total of 1,356,301 candidates attempted this question. The analysis of data shows that, 400,975 (29.56%) candidates chose the correct answer D. Thus, the candidates' performance on this question was weak as shown in Table 13.

Table 13: Number and Percentage of Candidates in each Option

| Option	A	B	C	D*	E	Others
Number of Candidates	142,456	213,453	415,417	400,975	158,261	25,739
Percentage	10.50	15.74	30.63	29.56	11.67	1.90

The analysis shows that 400,975 candidates (29.56%) chose the correct answer D "1,074,000". These candidates divided the profit obtained (shs 8,592,000) by the number of 8 members and determined that each received sh 1,074,000.

On the other hand, 955,326 candidates (70.44%) chose the incorrect options A, B, C, or E. These candidates failed to divide sh 8,592,000 correctly. For instance, candidates who chose option C divided sh 8,592,000 by 8 and obtained sh 174,000 instead of sh 1,074,000.

Question 25: Panju, Bakari and Amina shared 900,000 shillings as follows: Panju got twice amount of Bakari and Amina got three times amount of Panju's share. If Amina got a total of 600,000 shillings, how much money did a person with a small share get?

A sh. 400,000 B sh. 50,000
C sh.100,000 D sh. 200,000
E sh. 300,000

This question assessed the candidates' competency in applying pattern skills to solve real-life problems. A total of 383,021 (28.24%) candidates chose the correct option C "sh 100,000". Therefore, the candidates' performance was weak as shown in Figure 13.
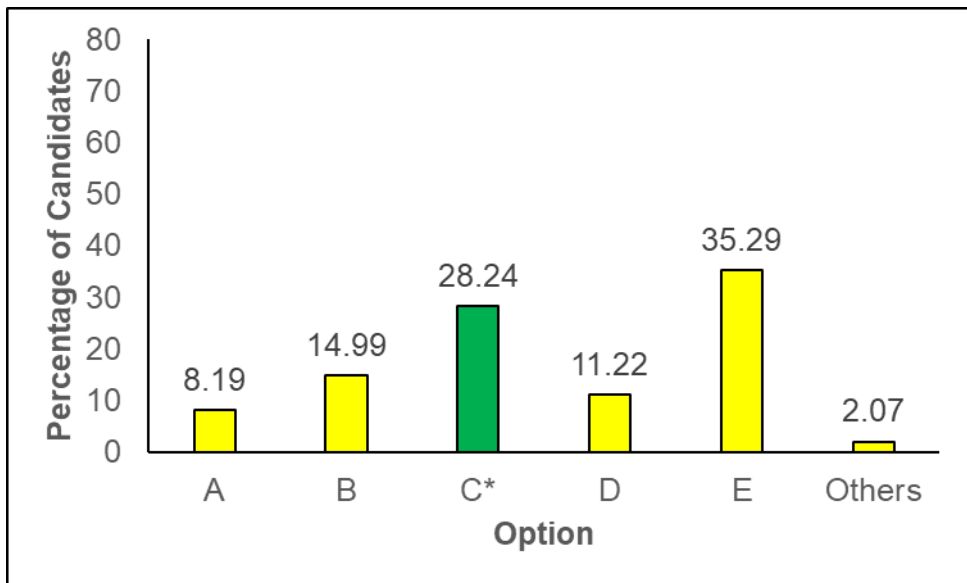
Figure13: *Percentage of Candidates for each Option in Question 25*

The analysis of data shows that 973,280 (71.76%) candidates chose distractor A, B, D, or E. These candidates were unable to formulate an equation which relates the amount of money shared among Panju, Amina and Bakari. For instance, the candidates who chose distractor A "sh 400,000" calculated the difference in amount obtained by Amina (sh 600,000) and Panju (sh 200,000) to get sh 400,000. The candidates who chose distractor B divided the amount of money obtained by Bakari by 2 to get sh 50,000. Also, the candidates who chose distractor D calculated the amount of money Panju got which was sh 200,000. Moreover, the candidates who chose distractor E "sh 300,000" added the amount of money Panju t got (sh 200,000) and Bakari (sh 100,000) to get sh 300,000.

On the other hand, the candidates who chose the correct options C "sh 100,000" realized that, the amount of 900,000 shillings was shared among Panju, Bakari, and Amina in the ratio 2:1:6, respectively. Moreover, they realized that Bakari is the one who got the smallest share which is $\frac{1}{9}$ of the total amount of money. Thus, they calculated $\frac{1}{9}$ of 900,000 shillings to get sh 100,000 as money for a person who got a small share.

Question 26: Mwajuma bought the following items: 5 kg of rice @ 2,200 shillings, 3 kg of beans @ 2,300 shillings and 4 kg of sugar @ 2,600 shillings. If Mwajuma had 50,000 shillings, how much money did she remain with after the purchases?

A   sh 31,700   B   sh 21,700
C   sh 28,300   D   sh 22,700
E   sh 23,700

The question assessed the candidates' competency in applying number relations to solve problems in different contexts. A total of 1,356,301 candidates attempted this question. Among them 556,766 candidates (41.05%) opted for the correct answer to this question, indicating that, the performance was average. Table 14 indicates the number and percentage of candidates in each option.

Table 14: Number and Percentage of Candidates in each Option

Option	A	B*	C	D	E	Others
Number of Candidates	198,878	556,766	282,102	191,233	104,734	22,588
Percentage	14.66	41.05	20.80	14.10	7.72	1.67

The analysis shows that the candidates who opted for the correct option B got the money she remained with (sh 21,000) after multiplying the cost of buying one kilogram of rice (2,200 shillings) by 5, the cost of buying one kilogram of beans (2,300 shillings) by 3 and the cost of buying one kilogram of sugar (2,600 shillings) by 4. Then, they added the costs of all items and got sh 28,300 Finally, they subtracted sh 28,300 from sh 50,000 to get sh 21,700.

On the other hand, a total of 799,535 (58.95%) candidates chose distractor A, C, D or E. The candidates incorrectly subtracted the amount of money used to purchase different items from 50,000. The candidates who chose distractor A "sh 31,700" forgot that in subtracting 28,300 from 50,000 they borrowed one from the tens thousands place. Thus, they ended up with the incorrect solution of sh 31,700. The candidates who chose distractor C "sh 28,300" calculated only the total amount spent and forgot to subtract it from the total amount of money she had. Also, the candidates who chose distractor D "sh 22,700" forgot that in subtracting 28,300 from 50,000, the digits in the thousands place after borrowing is 9, so

they used the original digit of zero instead of 9. Moreover, the candidates who chose distractor E "sh 23,700" they failed to subtract correctly the digits in the thousands place and ended up getting incorrect answer of sh 23,700.

Question 27: Mwajuma deposited the amount of 564,000 shillings in a bank, which gives an interest rate of 5½% per year. What is the amount of interest did she get after 6 months?

    A   14,100 shillings   B   18,612 shillings
    C   15,520 shillings   D   15,510 shillings
    E   18,513 shillings

The question assessed the candidates' competency in applying number relations to solve problems in different situations. A total of 293,860 (21.67 %) chose the correct answer, thus, the candidates' performance was weak as shown in Figure 14.
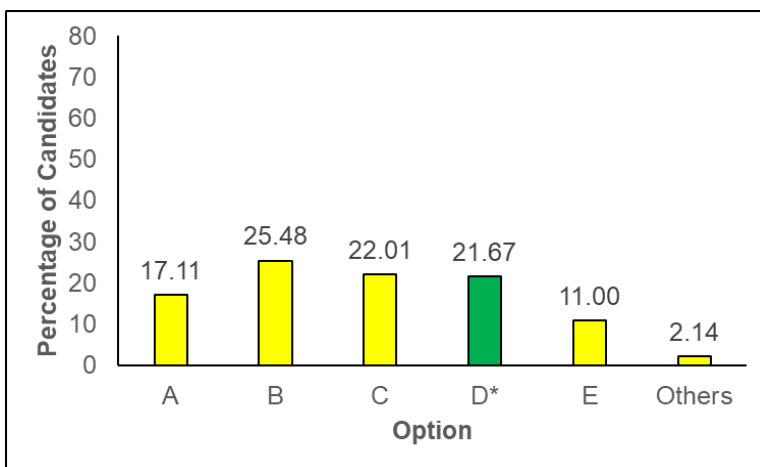
Figure 14: *Percentage of Candidates for each Option in Question 27*

The analysis of data shows that 1,062,441 candidates (78.33%) chose the incorrect answer A, B, C or E because they failed to calculate the required simple interest using the formula $I = \dfrac{PRT}{100}$.

For instance, the candidates who chose the incorrect answer A used the rate of $\dfrac{10}{2}$% instead of $\dfrac{11}{2}$% to get 14,100 shillings.

The candidates who chose distractor B "sh 18,612" divided the product of the principal, rate and time by 1,000 instead of 100.

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Moreover, the candidates who chose distractors C and E calculated the interest using the incorrect formula.

Conversely, the candidates who chose the correct option D "15,510 shillings" realized the principal, rate and time as sh 564,000, $5\frac{1}{2}\%$ and 6 months, respectively. Moreover, they had an understanding that, the period of 6 months is equal to half a year. Thus, they calculated the interest using the formula $I = \dfrac{PRT}{100}$ to get sh 15,510.

Question 28: A business man deposited 8,000,000 shillings in a bank which offers 8% of interest per year. After how many years would the interest be 1,600,000 shillings?

A   2   B $2\frac{1}{2}$ C   3

D   4   E $5\frac{1}{2}$

The question tested the candidates' ability to apply number relations to solve problems in different situation, particularly in simple interest. A total of 1,356,301 candidates attempted this question. Among them 374,862 candidates (27.64%) chose the correct option B; thus the question was weak performed as shown in Table 15.

Table 15: Number and Percentage of Candidates in each Option

Option	A	B*	C	D	E	Others
Number of Candidates	339,116	374,862	186,577	249,631	183,934	22,181
Percentage	25.00	27.64	13.76	18.41	13.56	1.64

The analysis shows that 374,862 candidates (27.64%) who chose distractor A, C, D or E, used incorrect formula. For example, candidates who chose distractor A "2", calculated the number of years of stated interest, by using the incorrect formula; $\left(I = \dfrac{P \times T}{10} \right)$, while those who chose distractor D "4" used the formula; $\left(I = \dfrac{P \times T}{R \times 10} \right)$.

Likewise, candidates who chose distractor E, wrongly simplified the number of years obtained $\left(\dfrac{5}{2} \right)$ to $5\frac{1}{2}$ years.

However, 374,862 Candidates (27.64%) chose the correct answer B "$2\frac{1}{2}$." Those candidates realized that the principal (P), interest (I) and percentage interest (R) are 8,000,000, 1,600,000 and 8%, respectively. Thus, they used the formula for finding interest, $\left(I = \dfrac{P \times R \times T}{100}\right)$ to calculate the number of years of the given interest, and getting $2\frac{1}{2}$ year's.

Question 29: The following diagram shows a wall of one of the buildings of Songambele Primary School. Find the value of h if the area of the wall is 192 m^2.
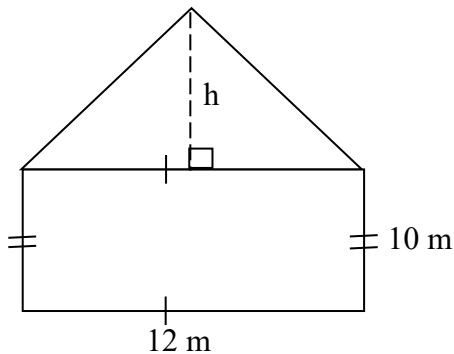
A 10 m	B 12 m	C 15 m
D 8 m	E 6 m	

This question tested the candidates' ability in using the concepts of shapes and figures to solve different real life problems. A total of 448,380 (33.06%) candidates chose the correct answer; thus the candidates' performance was weak as shown in Figure 15.
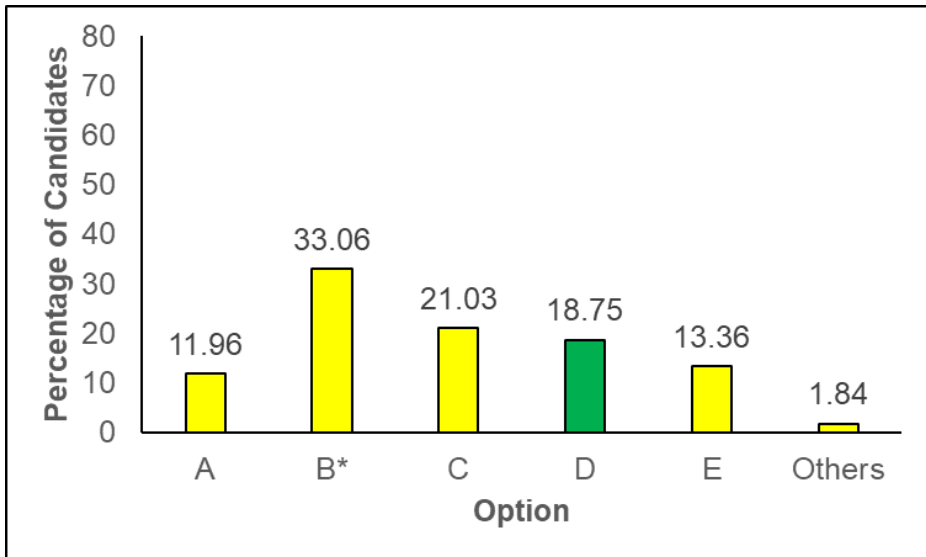
Figure 15: *Percentage of Candidates for each Option in Question 29*

As seen in Figure 15, a total of 907,921 (66.94%) candidates who chose the incorrect answer A, C, D or E used wrong formula. For instance, the candidates who chose distractor A "10 m" interpreted that the height of the triangle is equal to the width of the rectangle. The candidates who chose distractor E "6m", used the formula for calculating the area of a triangle as $\text{Area} = \text{height} \times \text{base}$ instead of Area of a Triangle$= \dfrac{\text{Base} \times \text{Height}}{2}$.

Despite the candidates' weak performance, 448,380 candidates (33.06%) chose the correct answer B "12m". The candidates calculated the value h using the area of a rectangle and triangle. Thus, they multiplied the length of 12 m by width of 10 m to get 120 m². Also, they subtracted 120 m² from 192 m² to get the area of the triangle equal to 72 m². Then, they calculated the value of h by equating $\dfrac{1}{2} \times 12 \times h$ with 72 m² whereby they got h equal to 12 m.

Question 30: The following figure represents a tank whose diameter is 56 cm and height is 60 cm. Find the area of its surface if the tank is open on one side, (use $\pi = \dfrac{22}{7}$).

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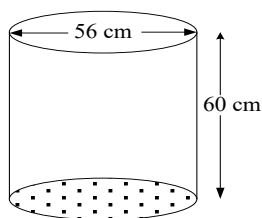
A	13,024 cm²	B	11,264 cm²
C	13,728 cm²	D	10,264 cm²
E	9,064 cm²		

The question assessed the candidates' competency in applying the concepts of shapes and figures to solve different problems. The analysis shows that 259,987 candidates (19.17%) chose the correct answer A, thus the performance of the candidates was weak as shown in Table 16.

Table 16: Number and Percentage of Candidates in each Option

Option	A*	B	C	D	E	Others
Number of Candidates	259,987	388,225	289,857	245,541	138,822	33,869
Percentage	19.17	28.62	21.37	18.10	10.24	2.50

The candidates who chose distractor B, C, D or E used the incorrect formula. For example, candidates who chose distractor B "11,264 cm²" calculated the area of the tank by using the formula, $\text{Area} = 2\pi dh - \pi d^2$ and obtained 11,264 cm².

On the other hand, 259,987 candidates (19.17%) chose the correct option A '13024 cm²'. The candidates realized that the tank opened on one side is formed by a rectangle and a circle. Additionally, they recognized that the height (h) and diameter (d) as 60 cm and 56 cm, respectively. Then, they calculated the area of the tank using the

formula, $\text{Area} = \pi dh + \dfrac{\pi d^2}{2}$ to get 13024 cm².

Question 31: A pupil measured the interior angles of a parallelogram and named them as angles e, f, g and h as shown in the following figure.

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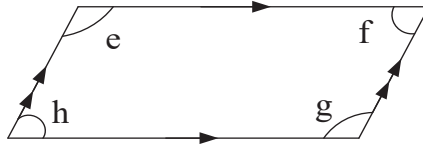
Which angles are equal?

A   e and f   B   h and e
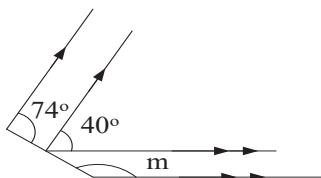C   h and g   D   h and f
E   g and f.

This question assessed candidates' competency in applying the concept of shapes and figures to solve different problems. Among them, 505,216 (37.25%) chose the correct answer, D. Therefore, the candidates' performance in this question was poor. Figure 16 illustrates the percentage of candidates for each option.
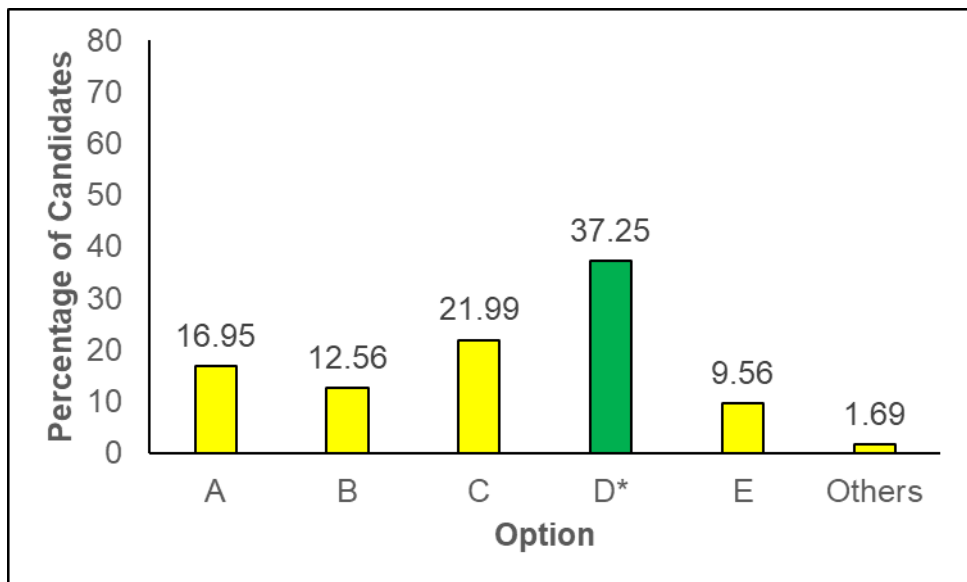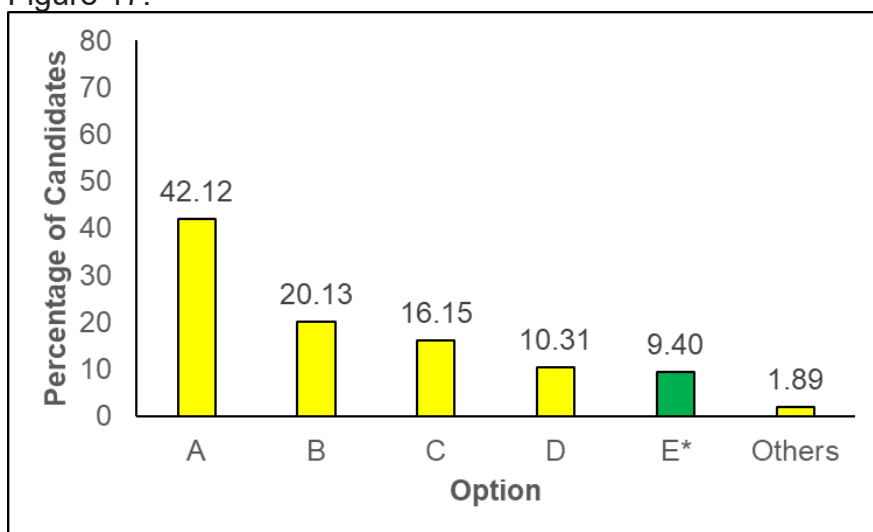

Figure 16: *Percentage of Candidates for each Option in Question 31*

The analysis shows that 851 (62.75%) candidates chose distractor A, B, C or E. These candidates had insufficient knowledge on opposite angles. For instance, the candidates who chose distractor B did not understand that angle h and e make a total of 180°.

On the other hand, the candidates who chose the correct answer D "h and f" realized that "h and f" are opposite angles of a parallelogram, hence, they are equal.

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Question 32: A teacher drew the following figure and asked pupils to find the value of angle *m*. What is the size of angle *m* in degrees?

A	114°	B	34°	C	140°
D	106°	E	146°		

This question assessed candidates' competency in applying the concept of shapes and figures to solve different problems. A total of 1,356,301 candidates attempted this question. The analysis shows that 127,486 (9.4 %) candidates chose the correct answer, thus the candidates' performance on this question was weak as shown in Figure 17.

Figure 17: *Number and Percentage of Candidates for each Option*

The analysis of the candidates' responses shows that, 88.7 per cent of the candidates chose distractor A, B, C or D. These pupils had insufficient understanding of angles formed by parallel lines. Example, candidates who opted for distractor A calculated the sum of the two angles 74° and 40° to obtain 114°. Candidates who chose distractor B calculated the difference between 74° and 40° to get 34°. Candidates who opted for distractor C calculated the supplementary angle of 40° and obtained 140°.
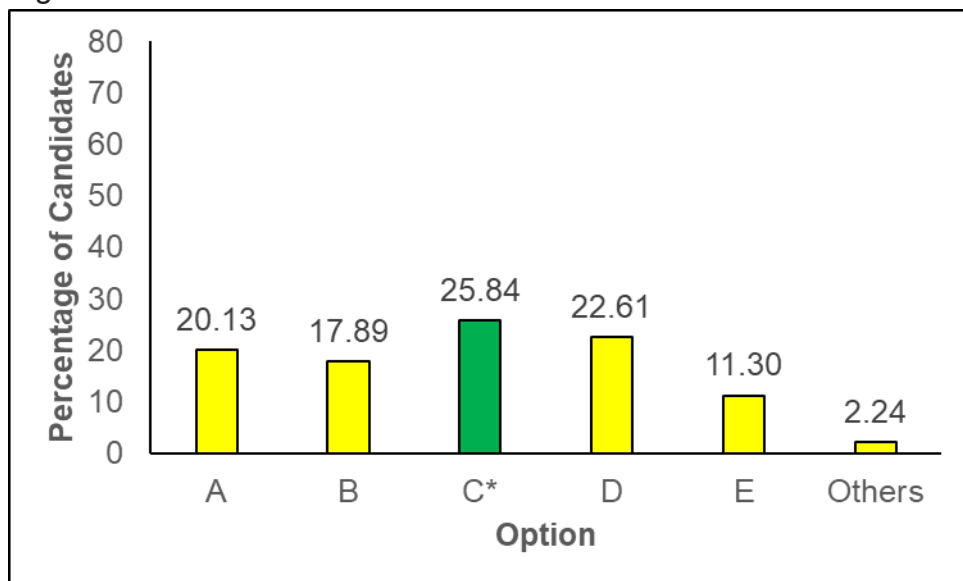
Likewise, the candidates who chose distractor D calculated the supplementary angle of 74° and obtained 106°, they lacked knowledge on determining the properties of angles formed by parallel lines.

On the other hand, 127,486 (9.4%) candidates who opted for the correct answer E "146°" realized that angle m is not supplementary to angle $74 - 40 = 34^0$ thus, $34 + m = 180^0$, then they solved for "m" to get 146^0.

Question 33: A rabbit weighs 4 kg 21 dag 48 dg. How many rabbits will weight 50 kg 57 dag 76 dg?

A	22	B	17	C	12	
D	7	E	20			

The question tested the candidates' competency in applying the concepts of measurements in different contexts. The analysis shows that 350,444 (25.84%) candidates chose the correct answer, hence the candidates' performance on this question was weak as shown in Figure 18.

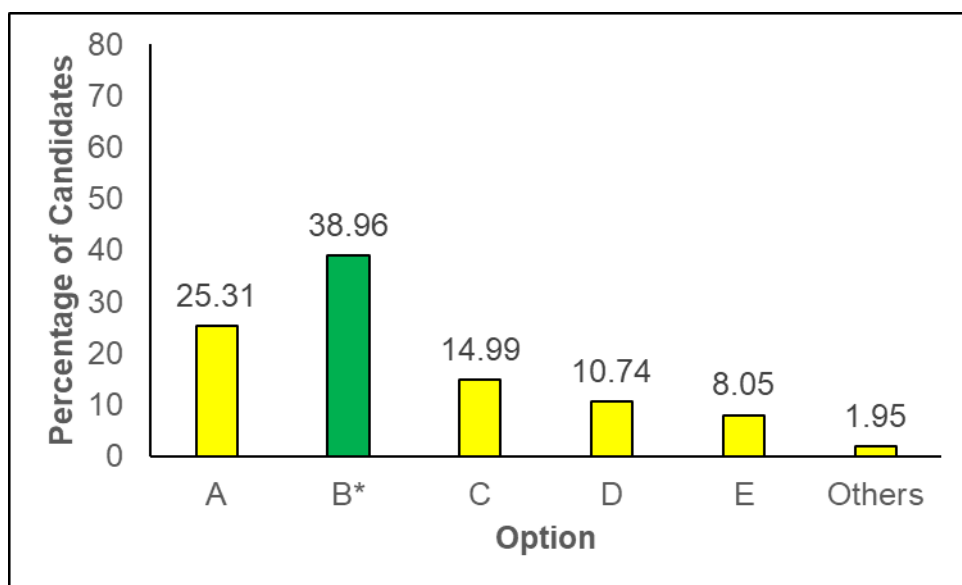**Figure 18:** *Percentage of Candidates for each Option in Question 33*

The analysis shows that 1,005,857 (74.16%) candidates chose distractors A, B, D or E. The candidates were unable to divide the units of weights.

However, a few candidates chose the correct answer C "12". The candidates were able to convert the weight of one rabbit into 42,148 dg and the weight of all rabbits into 505,776 dg. Then, they divided the weight of rabbits to the weight of one rabbit to get 12 rabbits.

Question 34: Opio walked at a distance of 42 dam 25 dm 8 cm in the morning and 12 dam 10 dm 7cm in the evening. Find the total distance he walked in centimetres.

  A   104 cm   B   54,365 cm
  C   5,765 cm   D   5,450 cm
  E   54,050 cm

This question assessed candidates' competency in applying measurements in different contexts. A total of 1,356,301 candidates attempted this question. The analysis shows that 528,456 (39.0%) candidates chose the correct answer, thus the candidates' performance on this question was weak as shown in Figure 19.

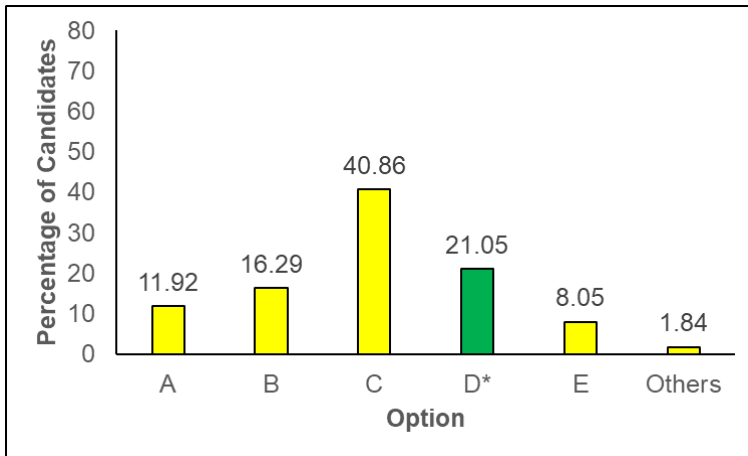**Figure 19:** *Number and Percentage of Candidates for each Option*

The analysis of the candidates' responses shows that, 801,411 (59.1%) candidates chose distractor A, C, D or E. The candidates who chose distractor A "104 cm" added all the numbers without considering their units. Candidates who opted for distractor C "5,765 cm" considered that 1 dam is equal to 100 cm instead of 1,000 cm. Thus, they converted 54 dam to get 5,400 cm instead of 54,000. The candidates who chose distractor D "5,450 cm" converted 54 dam to get 5,400 cm instead of 54,000 cm and added 35 dm without converting it to centimetres (5,400+35+15 = 5,450). Moreover, the candidates who opted for distractor E "54,050 cm" added 35 dm and 15 cm to 54,000cm without first converting 35 dm to centimetres and got 54,050 cm ($54,000 + 35 + 15 = 54,050$).

On the other hand, the candidates who chose the correct option B "54,365 cm" calculated the sum of 42 dam 25 dm 8 cm and 12 dam dm 7 cm and they got 54 dam 36 dm 5 cm. These candidates understood that, 1 dam is equal to 1,000 cm and 1 dm is equal to 10 cm. Thus, they converted 54 dam 36 dm 5 cm to centimetres and got 54,365 cm.

Question 35: 48 litres 450 mililitres of milk were equally shared by three families of 6 people each. What is the amount of milk did each family get?

A	16 *l*　15 *ml*	B	150 *l*　16 *ml*
C	8 *l*　75 *ml*	D	16 *l*　150 *ml*
E	15 *l*　16 *ml*		

The question assessed the candidates' competency in applying measurements in different life contexts. A total of 1,356,301 candidates attempted this question. The analysis shows that 285,441 (21.05%) candidates chose the correct answer; hence the candidates' performance was weak. Figure 20 shows the percentage of candidates in each option.

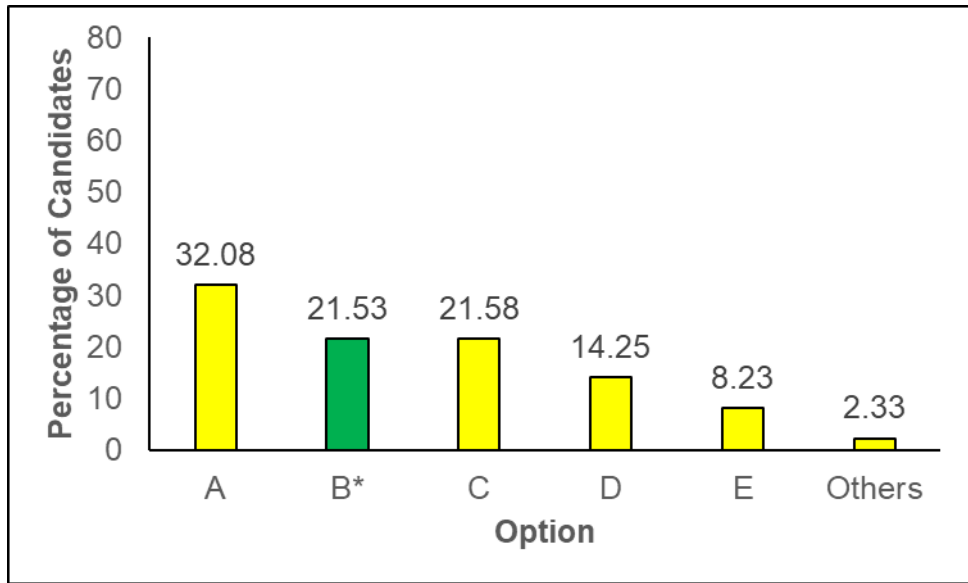**Figure 20:** *Percentage of Candidates for each Option in Question 35*

Figure 20 shows that 1,070,860 (78.95%) candidates chose distractor A, B, C or E. the candidates lacked skills to divide the units of volume. The candidates who chose distractor C "$8\ l\ 75\ ml$" divided the amount of milk in litres for each family by 2 to get 15 *l* 75 *ml*.

On the other hand, the candidates who chose the correct answer D "16 *l* 150 *ml*" divided correctly the amount of milk (48 litres 450 millilitres) by three families to get 16 *l* 150 *ml*.

Question 36: One tone of beans was distributed among 16 women. If all women received an equal share, how much did everyone get?

    A   62 kg 50 g   B   62 kg 50 dag
    C   62 kg 500 dg   D   62 kg 5,000 mg
    E   62 kg 500 hg

This question assessed the candidates' competency in applying measurements in different life contexts. A total of 1,356,301 candidates attempted this question. The analysis shows that 291,994 candidates (21.5%) chose the correct answer. Thus the candidates' performance on this question was weak as shown in Figure 21.
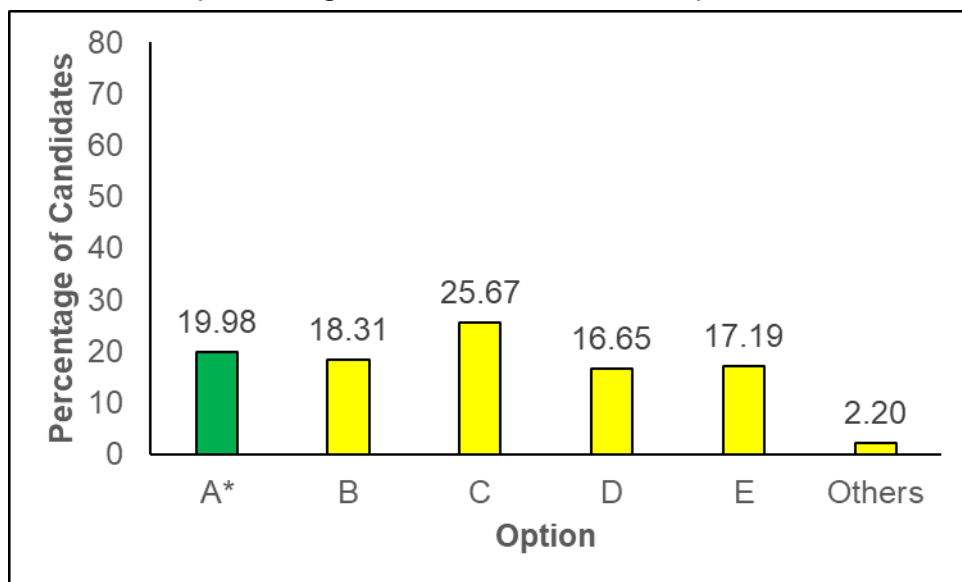
Figure 21: *Number and Percentage of Candidates for each Option*

The analysis of the candidates' responses shows that, 1,032,749 candidates (76.1%) chose distractor A, C, D or E. These candidates failed to convert 0.5 kg into grams, decigrams, milligrams or hectograms. For example, the candidates who chose distractor A "kg 62 g 50" assumed that 0.5 kg is equal to 50 grams instead of 500 grams. The candidates who chose distractor C "62 kg 500 dg" assumed 0.5 kg is equal to 500 decigrams instead of 5,000 decigrams. Also, candidates who chose distractor D "62 kg 5,000 mg" assumed 0.5 kg is equal to 5,000 milligrams instead of 500,000 milligrams. Likewise, candidates who chose distractor E "62 kg 500 hg" assumed 0.5 kg is equal to 500 hectograms instead of 5 hectograms.

On the other hand, 292,741candidates (21.6%) chose the correct option B "62 kg 50 dag". They converted one tone to kilograms and got 1,000 kg, then divided 1,000 kg by 16 and got 62.5 kg which is equal to 62 kg 50 dag.

Question 37: A train moves 720 km per hour. How is this speed written in centimetres per second?
  A   20,000 cm/sec
  B   2,000 cm/sec
  C   12,000 cm/sec
  D   1,200 cm/sec
  E   200 cm/sec

This question assessed the candidates' competency in applying measurement skills in different situations. A total of 1,356,301 candidates attempted this question. The analysis shows that 271,031 candidates (19.98%) chose the correct answer, thus the candidates' performance on this question was weak. Figure 22 indicates the percentage of candidates in each option.

Figure 21: *Percentage of Candidates for each Option in Question 37*

The statistical data shows that 1,085,270 (80.02%) candidates chose distractor B, C, D or E. Those candidates used the incorrect relationship between kilometres and centimetres or between hours and seconds. For example, the candidates who chose distractor B "2,000 cm/sec" or E "200 cm/sec" assumed that 1 km is equal to 10,000 cm or 1,000 cm, respectively. The candidates who chose distractor C "12,000 cm/sec" assumed that one hour is equal to 600 seconds instead of 3,600 seconds. Thus, the candidates divided 7,200,000 cm by 600 seconds to get 12,000 cm/sec. Also, the candidates who chose distractor D "1,200 cm/sec" assumed that 1 km is equal to 1,000 cm and one hour is equal to 600 seconds. Thus, the candidates divided 720,000 cm by 600 seconds to get 1,200 cm per second.

On the other hand, the candidates who chose the correct answer A "20,000 cm/sec" were competent in applying the formula of speed $(\text{speed} = \dfrac{\text{distance}}{\text{time}})$. They realized that 1 km is equal to 100,000 cm and one hour is equal to 3,600 seconds. Thus, they converted 720 km to get 720,000,000 cm and then divided 720,000,000 cm by 3,600 seconds to get 20,000 cm/sec.

Question 38:   If $n + 5 = 0$, what will be the value of the expression $\dfrac{(2n+3) \div (1-4n)}{2-n}$?

A $\dfrac{1}{21}$ B $-\dfrac{1}{21}$ C $\dfrac{7}{133}$

D $-\dfrac{7}{133}$ E $-\dfrac{1}{19}$

The question assessed the candidates' competency in applying the concepts of algebra to solve real life problems. A total of 1,356,301 candidates attempted this question. The analysis shows 424,048 candidates (31.3%) chose the correct answer, thus the candidates' performance on this question was weak as shown in Figure 23.
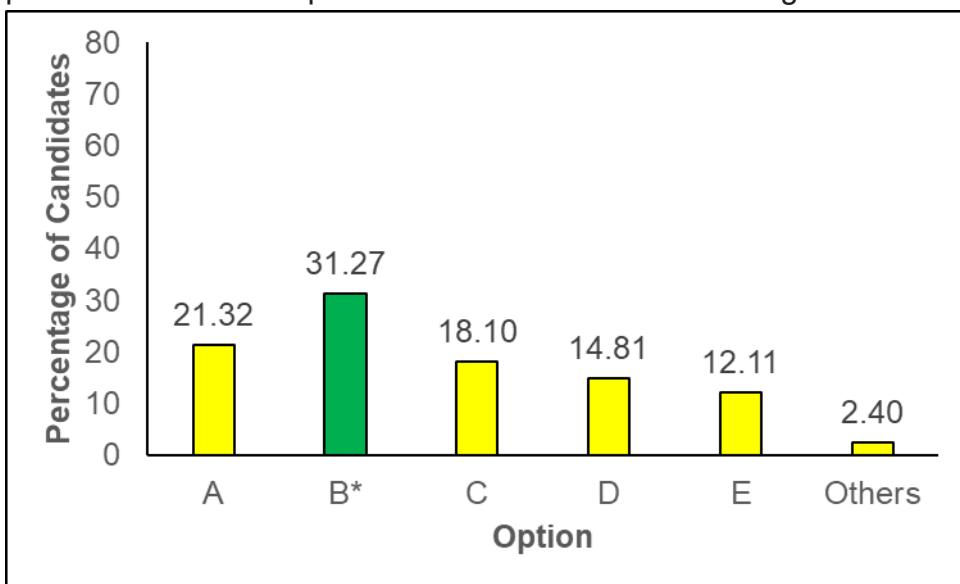

Figure 23: *Percentage of Candidates for each Option in Question 38*

The analysis of the candidates' responses shows that, 899,706 candidates (66.3%) chose distractor A, C, D or E. Many candidates did not consider the use of integers in solving the equation, thus getting an incorrect result. For example, candidates who chose distractor A '$\frac{1}{21}$' solved the first equation 2n+3 as $2(-5)+3$ and got 7 instead of -7. Also, the candidates who chose distractor C or D, failed to calculate the equation because their answers reflect that they got n=+5 instead of n=-5.

However, 424,048 candidates (31.3%) chose the correct option B '$-\frac{1}{21}$'. The candidates calculated the value of n, from the given equation (n+5 =0) to get n=-5. They subtracted five (5) from zero (0) after moving (5) to the right side of the equal sign "= "to make the value of n equal to -5. Then they substituted the value of n obtained (-5) to the given expression $\frac{(2n+3)\div(1-4n)}{2-n}$ in each place of n and simplified to get $-\frac{1}{21}$.

Question 39: The following pie chart shows the amounts of food which were sold per week in a whole sale shop.
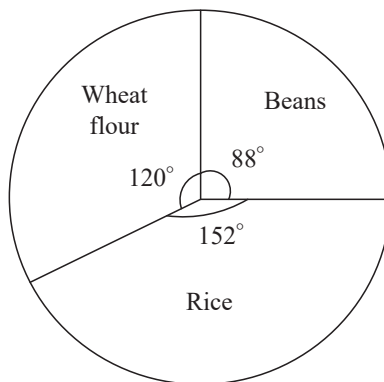
If 300 kilograms of wheat flour were sold for the whole week, how many kilograms of rice were sold?

A	900	B	600
C	380	D	220
E	152		

The question assessed the candidates' competency in applying statistical skills to present different information. A total of 1,356,301 candidates attempted this question. The analysis shows that 410,209 candidates (30.24%) chose the correct answer, thus the candidates' performance on the question was weak. Figure 24 indicates the percentage of candidates in each option.
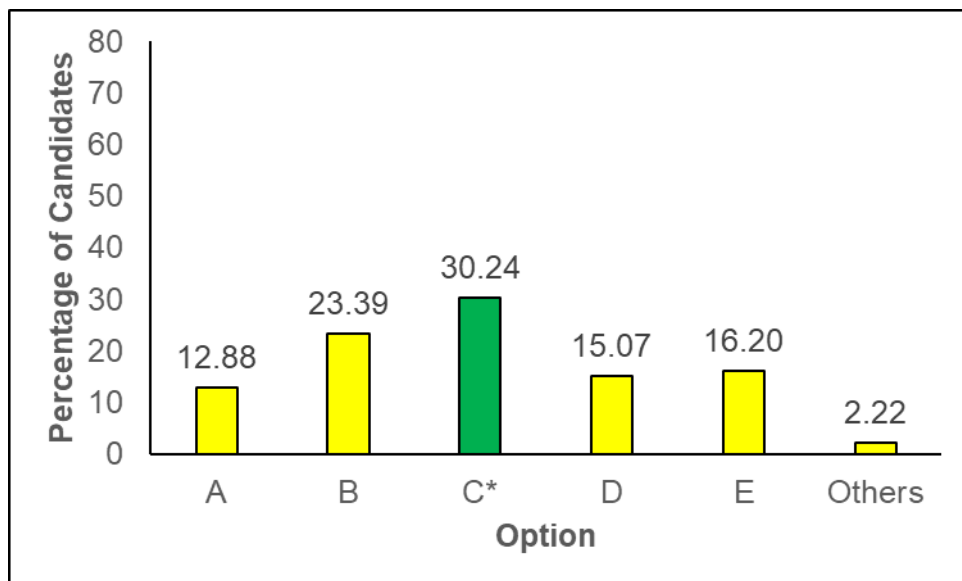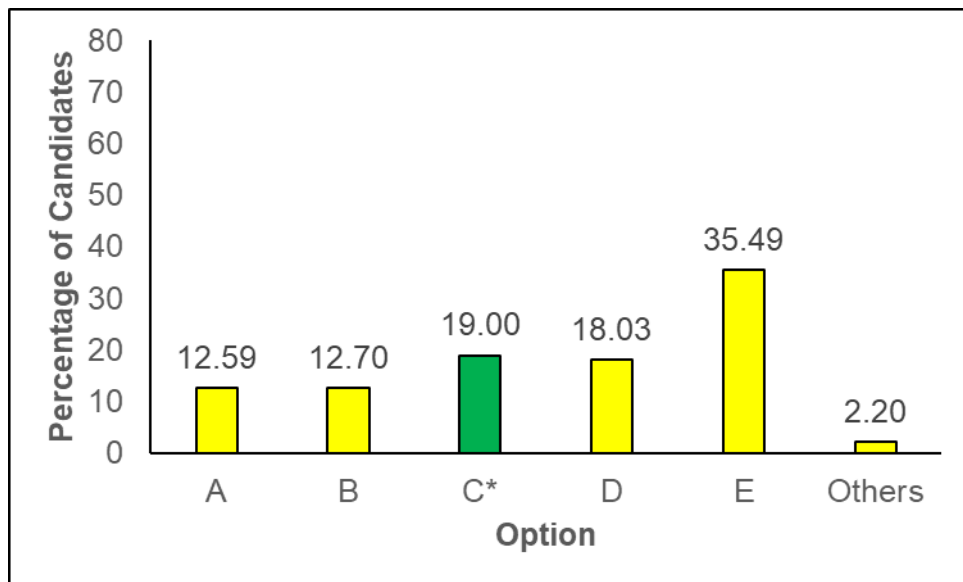

Figure 24: *Percentage of Candidates for each Option in Question 39*

The analysis show that, 946,092 candidates (69.76%) chose distractor A, B, D or E. Those candidates were unable to use the pie chart in solving the given word problem. For instance, the candidates who chose distractor A "900" calculated the total amount of food sold for the whole week. The candidates who chose distractor B "600" calculated the difference between the amount food sold for the whole week (900 kg) and the amount of wheat flour (300 kg). Also, the candidates who chose distractor D "220" calculated the amount of beans sold throughout the week. In addition, the candidates who chose distractor E "152" quoted the answer representing the size of an angle representing the rice sold on a pie chart.

On the other hand, the candidates who chose the correct answer C "380" used the ratio of degrees representing wheat flour (120^0) and the number kilograms of wheat flour sold throughout the week (300 kg) to calculate the amount of food sold throughout the week by making a simple equation $\frac{120^0}{360^0} x = kg\,300$. Then, the candidates calculated the equation to get 900 kg. Finally, they multiplied $\frac{120}{360}$ by 900 kg of food sold to get 380 kg of rice.

Question 40: The average weight of six pupils of Standard Seven is 48 kilograms. If the weight of the seventh pupils is added the average will be 50 kilograms. Find the weight of the seventh pupil.

    A   50 kilograms   B   49 kilograms
    C   62 kilograms   D   18 kilograms
    E   98 kilograms

The question assessed candidates' competency in applying statistical skills to present different information. A total of 1,356,301 candidates attempted this question. The analysis shows 257,645 candidates (19.0%) chose the correct answer C, thus the candidates' performance was weak as indicated in Figure 25.

Figure 25: *Percentage of Candidates for each Option in Question 40*

49

The analysis of the candidates' responses shows that, 1,068,781 candidates (78.8%) chose distractor A, B, D or E. These candidates failed to find the average weight of students using the formula. For example, candidates who chose distractor A "50 kilograms" copied the average of seven pupils. Candidates who chose distractor B "49 kilograms" calculated the average weight of seven pupils and six pupils. Candidates who chose distractor E "98 kilograms" calculated the sum of the average weight of six pupils (48 kilograms) and that of seven pupils (50 kilograms). Candidates who chose distractor D "18 kilograms" subtracted the average weight of six pupils "48 kilograms" from that of seven pupils "50 kilograms".

On the other hand, 257,645 candidates (19.0%) who chose the correct option C "62 kilograms" correctly used the formula. These candidates correctly divided the weight of 7 pupils by 7 pupils to get $288 + x = 350$. Then, they solved the equation $288 + x = 350$ to get x = 62 kg which was the weight of the seventh pupils.

2.2 Section B: Short Answer Questions

Question 41:   A school has the area of 240 m^2 and its length is 15 m. What is the square root of the width of the school's area?

This question assessed the candidates' competency in applying the concepts of shapes and figures to solve different problems. A total of 1,356,301 candidates attempted this question. The analysis shows that 64,591 (14.05%) candidates scored 1.0 to 2.0 mark(s), thus the candidates' performance on the question was weak as shown in Figure 26.
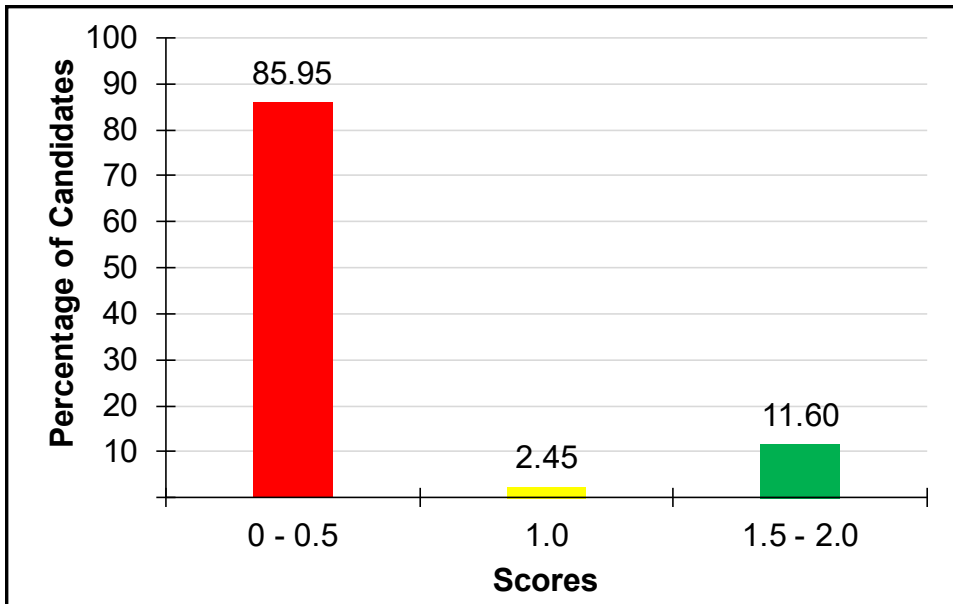
Figure 26: *Performance of candidates on question 41*

As seen in Figure 25, a significant number of candidates (85.95%) had poor performance due to various reasons. The response of some candidates did not meet the requirements of the question. For example, some of them wrote the width of the school area (16 m) as the required answer. They did not calculate the square root of the width. Moreover, some candidates multiplied the area of the school by the length of the area of the school found. Other candidates added the area of the school to its length. Extract 41.1 shows a sample response of one of the candidate who calculated the square of the school's width instead of its square root.

Extract 41.1: A sample of an incorrect response to question 41

In Extract 41.1, the candidate calculated the square of a width of a school area instead of its square root of a width of a school area.

Despite the candidates' weak performance 54,730 (4.04%) candidates scored all marks. These candidates realized that the school area has a rectangular shape. Therefore, the candidates used the formula for calculating the area of a rectangle $\text{Area} = \text{length}\,(l) \times \text{Width}\,(w)$ whereby they solved the equation $240 = 15 \times w$ to get the width of a school equal to 16 m. Then, they calculated the square root of 16 to get 4. Extract 41.2 indicates a sample of a correct response from one of the candidate.

QUESTION NO. 41	
$A = L \times W$ $240m^2 = 15m \times W$ $\dfrac{240m^2}{15} = \dfrac{15W}{15}$ $16 = W$	$\sqrt{16} = 4$ ∴ The square root of the width is 4

Extract 41.2: A sample of a correct response to question 41

In Extract 41.2, the candidate recognized that the school is in a rectangular shape and applied a correct formula to find the width of a school and then calculated the square root of the width obtained.

Question 42: A school owns an onion garden which is in trapezium shape ABCD as shown in the following figure:
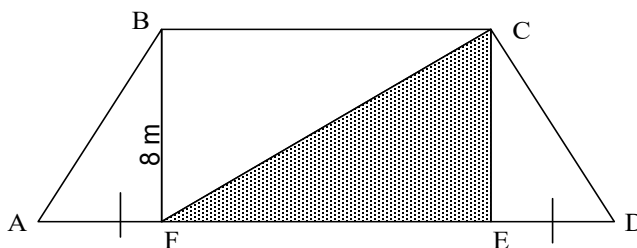
If the area of the shaded region is 48 m² and the length AF is 6 m, find the area of the whole garden.

The question assessed candidates' competency in applying the concepts of shapes and figures to solve different problems. A total of 1,356,301 candidates attempted this question. The candidates' performance in question 42 is shown in Figure 27.
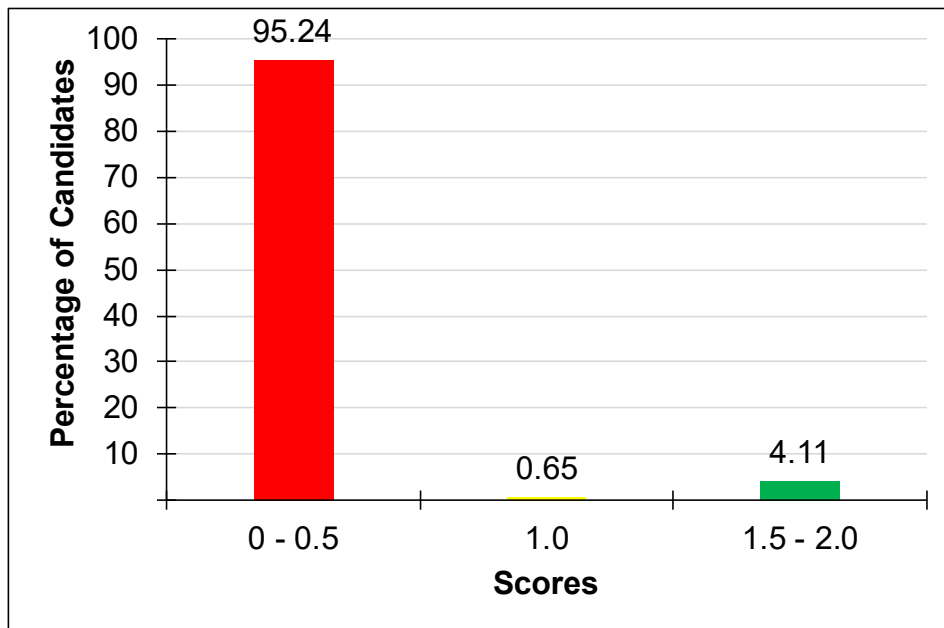
Figure 27: *Performance of candidates on question 42*

The analysis of data shows that, 291,710 (95.24%) candidates scored low marks due to various reasons. Most candidates calculated the area of triangle AFB whereby they got 24 m^2. Furthermore, several candidates added the units of a garden $(48+6+8)$ to get 62. While others multiplied the area of the shaded region by the length AF (48×6) to get 288. Extract. 42.1 shows the incorrect answer of one of the candidates who failed to answer this question.

Extract 42.1: Sample of an incorrect answer in question 42.

Extract 42.1, the candidate did not consider the area of the triangle BCF which is also part of the trapezium ABCD.

Despite the weak performance, 54,730 (4.04%) candidates. The candidates had adequate skills on how to find the area of a trapezium. Those candidates calculated the base EF of triangle CEF to get 12 m; identified 12 m and 24 as lengths for two parallel sides respectively and made the correct substitution BF, BC and AD in the formula $E_2 = \frac{1}{2} \times \overline{BF}\left(\overline{BC} + \overline{AD}\right)$. Finally, they calculated $Area = \frac{1}{2} \times 8 \times (12 + 24)$ to get the area of the whole garden equal to 144 m². Extract 42.2 represent the correct answer from one of the candidates.

Extract no. 42.2: Sample of correct answer in question 42

In Extract 42.2, the candidate calculated the length of EF and used the correct formula to get the required area of a trapezium.

Question 43: In the following figure, the shaded region represents the area of a farm that is grown onions.

20 m

14 m
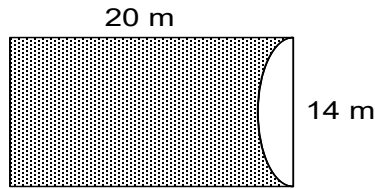
Find the area of the part that is grown onions.

(Use π = $\frac{22}{7}$)

This question assessed the candidates' competency in applying the concepts of shapes and figures to solve different problems. A total of 1,356,301 candidates attempted this question. Among them 66,973 (4.94%) candidates scored from 1.0 to 2.0 marks. So, the candidates' performance was weak. Figure 28 shows the candidates' performance in this question.
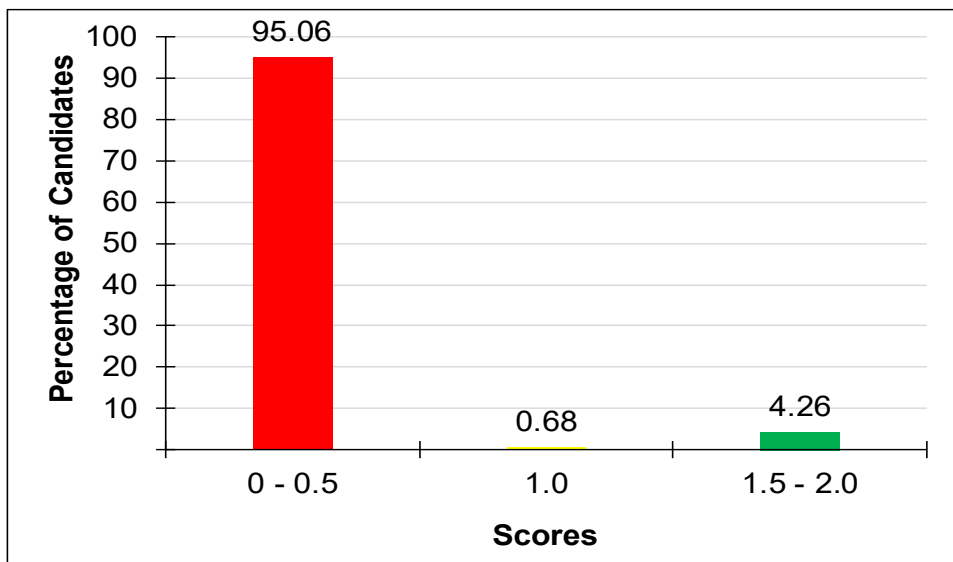
Figure 28: *Performance of candidates on question 43*

As seen in Figure 28, 1,289,328 (95.06%) had weak performance due to various reasons. For instance, several candidates calculated the area of a semicircle using the incorrect formula. Some

candidates calculated area of a rectangle and did not proceed to calculate the area of a semicircle while others computed the area of the part that was not planted with onions to get 77 m². Extract 43.1 shows a sample response of one of the candidate who failed to answer this question correctly.

QUESTION NO. 43			

$L×W - \pi r^2$
 $20×14$ 20
      $×14$
 $4 = \frac{d}{2}$ 80
      20
      280
 $\frac{14}{2}$
	$\frac{22×7×7}{7}$
	 $\frac{280}{154}$
	 $L×W - \pi r^2$
	 $L×W = 280$
		$\pi r^2 = 254 \; 154$
		 $\frac{280}{154}$
		 126
			$= 126 m^2$

Extract 43.1: A sample of an incorrect response to question 43

Extract 43.2 shows a candidate who calculated the area of an unshaded part using a formula of calculating area of a circle instead of semicircle.

Despite the candidates' weak performance, 56,408 (5.16%) candidates scored all marks in this question. Those candidates multiplied the length of 20 m by the width of 14 m to get 280 m² of the rectangle. Furthermore, they correctly substituted the radius of a circle (7m) into the formula $E_2 = \frac{1}{2}\pi r^2$ and then calculated $\frac{1}{2} × \frac{22}{7} × 7^2$ whereby they got the area of a semicircle equal to 77 m².

Finally, they subtracted the area of the semicircle from the area of the rectangle to get the area of the part that was planted with onions equal to 203 m². Extract 43.2 shows the sample of the correct answer from one of the candidate.

Area of rectangle = L×W

=20m × 14m

=280m²

Area of semi-circle = $\frac{\pi r^2}{2}$

= $\frac{22 \times \overset{1}{7}m \times 7m}{\underset{1}{7} \quad \underset{1}{2}}$

= 77m²

Onions' area

280m²–77m²

203m²

∴ 203m²

Extract 43.2: Sample of the correct answer to question 43.

In Extract 43.2 the candidate had adequate knowledge on calculating the area of a part that is grown with onions.

Question 44:   If a Mathematics lesson takes a period of 40 minutes, how many periods of that lesson will be taught from 8:00 a.m. to 9:20 a.m.?

This question assessed the candidates' competency to solve word problems related to time. A total of candidates 1,356,301 attempted this question whereby 539,256 candidates equal to 39.76 percentage, scored 1.0 to 2.0 marks. Thus, the performance of the candidates in this question was weak. Figure 29 shows the percentage of candidates and the classes of their scores.
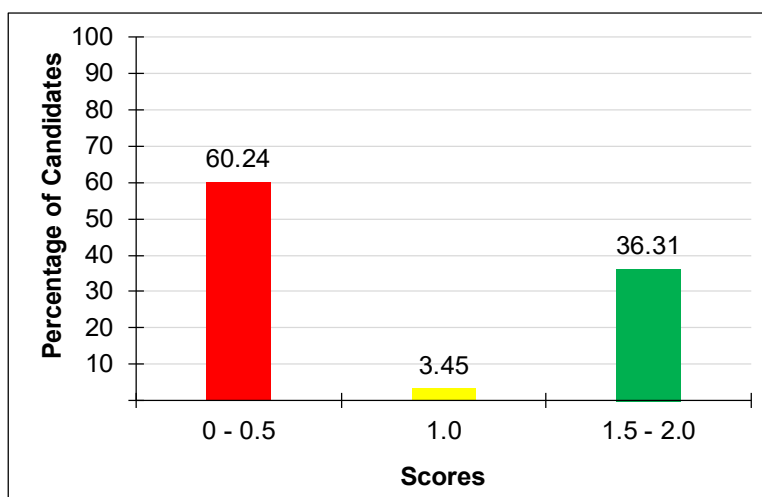
Figure 29: *The Candidates Performance in Question 44*

In this question, 1,269,152 (93.57%) candidates scored 0 or 0.5. These candidates failed to recognize the relationship between hour and minutes. For example, some candidates calculated the time difference between 2:00 a.m. and 3:20 a.m. and got 1 hour and 20 minutes (80 minutes). They interpreted 3:20 a.m. as the time spent teaching instead of the time to finish teaching. In addition, other candidates added 3 hours and 20 minutes to 2:00 a.m. and got 5:20 a.m.

Furthermore, other candidates divided the time spent teaching one session (40 minutes) by the time between 2:00 am and 3:20 am (80 minutes) and got $\frac{1}{2}$. The candidates were required to divide 80 minutes by 40 minutes to determine the number of sessions to be taught. Extract 44.1 is a sample of an incorrect response from one of the candidates.

Extract 44.1: A sample incorrect answer in question 44

Extract 44.1 shows that, the candidate calculated the time between 2:00 a.m. and 3:20 a.m. and got 1 hour and 20 minutes or 80 minutes as the number of lessons.

On the other hand, 491,152 (36.31 %) candidates scored 2.0. These candidates noted that the time between 2:00 a.m. and 3:20 a.m. is 80 minutes. Thus, they divided 80 minutes by the time spent teaching one session (40 minutes) and got 2 sessions. Extract no. 44.2 shows a sample of the correct answer from one of the candidates.

8:00am (0800hrs)	T.difference =	Hrs	min		1 lesson = 40min
9:20am (0920hrs)		09 20	− 08 00		? X = 80min
		= 1hr 20min			⇒ 2 lessons
		= 80min			
				∴ 2 Lessons	

Extract 44.2: A sample of the correct answer in question 44

Extract 44.2 shows the candidate who calculated the time spent teaching as 1 hour and 20 minutes which is 80 minutes. Thus, he divided 80 minutes by the time spent teaching one period (40 minutes) and got two (2) periods.

Question 45: Musa deposited sh 450,000 in a bank which offers an interest of $4\frac{1}{2}\%$ per year. What is the amount of interest did he get in 8 months?

The question assessed the candidates's competency in applying number relations to solve problems in different situations. A total of 356,301 candidates attempted this question 87,149 candidates (6.43%) scored 1.0 to 2.0 mark(s). Thus, the candidates' performance was weak. Figure 30 summarizes the candidates' performance on this question.
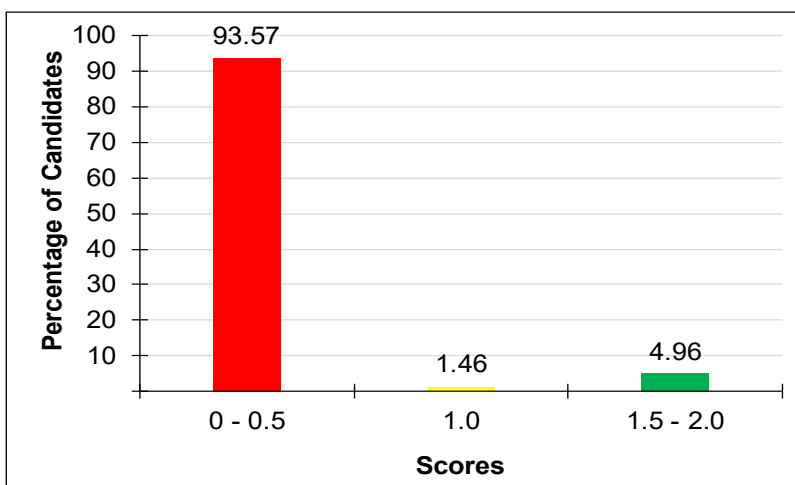
Figure 30: *Performance of Candidates in Question 45*

In this question, 1,269,152 (93.57%) candidates scored 0 or 0.5. These candidates failed to convert the duration of 8 months in a year during the money deposited in a bank. For example, some of the candidates did not convert 8 months into years. Also, some candidates used incorrect formula in calculating the amount of interest (I). For instance, some of the incorrect formula that they used were, $I = \dfrac{PR}{100}$ and $I = \dfrac{PT}{100}$. Extract 45.2 shows a sample of incorrect answer of one of the candidates who failed to answer this question correctly.

Extract 45.2: A sample of an incorrect response to question 45

In Extract 45.2, the candidate substituted $T = 8$ in the formula instead of $T = \dfrac{8}{12}$.

On the other hand, 87,149 (6.43 %) candidates scored 2.0 marks. These candidates understood that, Musa deposited the principal (P) of sh. 450,000 and the interest rate (R) is $4\dfrac{1}{2}$. Also, the candidates understood that the amount of interest has been given per year. So, they converted 8 months to years (T) and got $\dfrac{8}{12}$ years. Thus, the candidates used the formula of calculating the amount of interest which is $I = \dfrac{PRT}{100}$ and got the profit of sh. 13,500. Extract 45.1 shows a sample of a correct response from one of the candidates.

QUESTION NO. 45	
$I = \dfrac{PRT}{100}$	$= \dfrac{450\,000 \times \cancel{9}3 \times \cancel{2}1}{\cancel{100} \times \cancel{2}_1 \times \cancel{3}_1}$
$4\frac{1}{2}\% = \frac{9}{2}\%$	
$1yr = 12\,mon$ $8mon \times 1yr = \frac{2}{3}yr$	$= 13500/=$
$\frac{?}{} \times 8\,mon$ $12\,mon$	
	$\therefore \underline{13\,500\ shillings}$

Extract 45.1: A sample of a correct response to question 45

In Extract 45.2, the candidate showed the competency in calculating the interest for the period of 8 months and got a profit of sh. 13,500.

3.0   SUMMARY OF THE CANDIDATES' RESPONSE ANALYSIS

The analysis of the candidates' responses shows that, out of 40 questions from Section A, 2 questions were well performed. Out of these questions one was set from the competency of *Applying the Concepts of Patterns to Solve Real Life Problems,* and the other from the competence of *Applying the Concepts of Numbers to Communicate Ideas and Concepts in Different Contexts.*

Further analysis shows that 4 questions were averagely performed. Out of these questions one was set from the competency of *Applying the Concepts of Patterns to Solve Real Life Problems,* another one from Applying *the Concepts of Numbers to Communicate Ideas and Concepts in Different Contexts,* and two from the competency of *Applying Number Relations to Solve Problems in Different Contexts*.

On the other hand, the analysis shows that 34 questions had a weak candidates' performance. The analysis shows that the questions were set from the competencies of *Applying the Concepts of Patterns to Solve Real Life Problems, Applying Number Relations to Solve Problems in Different Contexts, Applying Measurements in Different Contexts, Applying Algebraic Skills in Daily Life, Applying Mathematical Operations to Solve Problems, Applying Statistical Skills to Present Different Information* and *Applying the Concepts of Shapes and Figures to Solve Different Problems*.

In Section B, all questions were performed poorly.The analysis of the candidates' performance competency-wise is shown in Appendix I.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The analysis shows that the candidates had difficulties in solving the questions which were examined from some of the competencies due to various reasons. The candidates failed to correctly interpret word problems and information that are presented in figures and tables into mathematical statements. Also the candidates failed to use basic mathematical operations on the concept of whole numbers, decimals, fractions, percentages, Roman numbers, square and square root and were unable to distinguish between factors and multiples. Likewise, the candidates failed to apply formulae in finding the area, perimeters and volume of different figures as well as converting metric units of time, length, mass and volume.

4.2 Recommendations

In order to further improve the candidates' performance in Mathematics the following are recommended:

(a) In the competency *of Applying the concepts of numbers to communicate ideas and concepts in different contexts*, teachers should emphasize pupils to read and write numbers in words. Also, they have to put emphasis on distinguishing the two concepts that have been challenging the pupil's day to day; the concept of place value and total value. Likewise, teachers should use the concept of patterns to teach pupils to arrange the numbers in ascending and descending orders. And arranging other numbers such as even numbers, odd and prime numbers in the correct order. In approximating the numbers, teachers should teach pupils to approximate whole numbers in the given place values and approximating in numbers in decimal places. Teachers should also distinguish the two concepts of place value and total value. The concepts of arranging numbers, counting in groups, writing in short and long form should also be emphasized. Teachers are emphasized to use real objects in teaching the numbers.

(b)   In the competence of *Applying Mathematical Operations to Solve Problems*, teachers should teach the pupils how to arrange the numbers in pace values when they are adding or subtracting vertically. Pupils also should be taught thoroughly on adding numbers to get the answer by carrying and without carrying. In subtraction pupils should be taught thoroughly to subtract numbers without regrouping and with regrouping. In Multiplication teachers are emphasized to use multiplication charts and in division pupils should be taught how to divide numbers without a reminder and with a reminder. Teachers are insisted to apply mathematical operations in other concepts of number such as fractions, decimals, integers and in Roman numbers.

(c)   In the competence of *Applying Number Relations to Solve Problems in Different Contexts*, teachers should guide the pupils to use the correct formula in calculating the bank interest which consists of four elements of Interest, Principal, Rate and Time. The time used to keep money in the bank should be specified whether months or years.

(d)   In the competence of *Applying the Concepts of Shapes and Figures to Solve Different Problems*, teachers should teach the pupils all types of shapes and figures; plane figures, three dimensional figures and the shapes concerning with angles. Teachers should insist on using the correct formula in calculating perimeters and areas in plane figures and the correct formula in three dimension figures to calculate areas and volume, as well as formulating equations in the questions concerning with angles. Moreover, types of triangles, Geometric lines (parallel lines, perpendicular and line of symmetry) and types of angles should be identified and differentiated.

(e)   In the competence of *Applying the Concepts of Algebra to Solve the Real Life Problem*, teachers should teach thoroughly the pupils the concept of expression, equation, types of equations and how to simplify the Algebraic expression. Teachers should guide the pupils on how to translate information by using Algebraic equations. Likewise, teachers have to build capacity to pupils on how to use Algebraic knowledge in other mathematical concepts of Geometry and Ratio.

(f)   In the competence of *Applying Statistical Skills to Present Different Pieces of Information*, teachers should teach all the types of graphs which are pictograms, histograms, bar graphs and pie charts and how they differ. In a pie chart, teachers should teach how to calculate the questions with different data of degrees, fractions, decimals and percentages shown in the given chart.

(g)   Teachers should be encouraged to correct pupils' work and provide feedback after conducting formative assessments

Appendix: Performance Comparison

Comperison of candidates' performance in each competencyin the psle 2022 and 2023

No.	Specific competency	2022 Examination				2023 Examination			
		Performance per question		% of average performance	Remarks	Performance per question		% of average performance	Remarks
		Question number	% of performance			Question number	% of performance		
1	Apply the concept of pattern to solve real life problems	8	54.42	54.46	Avarage	8	23.37	40.52	Avarage
		9	55.76			9	51.43		
		10	62.92			10	31.37		
		11	53.95			11	61.59		
		12	45.46			12	34.86		
2	Apply the concept of numbers to communicate ideas and concepts in different contexts	1	65.64	45.08	Average	1	84.16	33.89	Weak
		2	70.62			2	34.93		
		3	39.91			3	43.56		
		4	66.50			4	11.96		
		5	25.16			5	17.08		
		6	32.33			6	36.96		
		7	15.39			7	28.43		
						41	14.05		
3	Apply number relations to solve problems in different contexts	23	23.95	35.56	Weak	23	42.72	29.63	Weak
		24	72.87			24	29.56		
		25	36.66			25	28.24		
		26	45.18			26	41.05		
		27	38.89			27	21.67		
		28	19.52			28	27.64		
		44	27.29			44	39.76		
		45	20.11			45	6.43		
4	Apply measurement in different contexts	33	17.79	24.95	Weak	33	25.84	26.85	Weak
		34	18.43			34	38.96		
		35	14.65			35	21.05		
		36	27.22			36	21.56		

No.	Specific competency	2022 Examination		% of average performance	Remarks	2023 Examination		% of average performance	Remarks
		Performance per question				**Performance per question**			
		Question number	% of performance			Question number	% of performance		
5	Apply the concept of algebra to solve real life problems	37	46.76	36.61	Weak	37	19.98	25.63	Weak
		38	26.46			38	31.27		
6	Apply mathematical operations to solve problems	13	28.74	36.72	Weak	13	28.14	25.08	Weak
		14	22.34			14	30.30		
		15	71.90			15	36.38		
		16	79.80			16	16.17		
		17	53.65			17	35.08		
		18	42.57			18	11.43		
		19	28.70			19	20.58		
		20	30.70			20	27.35		
		21	21.49			21	33.82		
		22	20.98			22	11.59		
		41	3.06						
7	Apply statistical skills to present different context	39	17.79	24.95	Weak	39	30.24	24.62	Weak
		40	32.11			40	19.00		
8	Apply the concept of shapes and figures to solve different probles	29	17.48	17.22	Weak	29	33.06	18.10	Weak
		30	14.45			30	19.17		
		31	30.45			31	37.25		
		32	24.23			32	9.40		
		42	4.95			42	4.76		
		43	11.27			43	4.94		