THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CANDIDATES' ITEM RESPONSE ANALYSIS REPORT FOR THE PRIMARY SCHOOL LEAVING EXAMINATION (PSLE) 2020

04 MATHEMATICS

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FOREWORD

The Candidates' Response Analysis Report for Primary School Leaving Examination (PSLE) in the year 2020 was prepared in order to give feedback to educational stakeholders on how the candidates answered the examination questions in Mathematics. Generally, the performance was good because 64.64 percent passed.

The analysis of the candidates' responses was done in order to identify the topics which were well, averagely and poorly performed. The analysis shows that 4 topics of *Decimals, Whole Numbers, Roman Numbers,* and *Fractions* had a good performance; 4 topics of *Algebra, measurements, Currency* and *Percentage* had an average performance and 3 topics of *Geometry, Statistics* and *Number patterns* were poorly performed.

Furthermore, the analysis shows that the candidates' poor performance was caused by factors such as failure to formulate equations from word problems and geometrical figures, to apply formulae for finding the area of triangle, square and the surface of a rectangular prism and inability to find the volume of a cylinder as well as to change various units into other units.

The National Examinations Council of Tanzania believes that this report will help to improve the candidates' performance in future Mathematics examinations.

Finally, the Council would like to thank all the examination officers and other experts who participated in preparing this report.

Dr. Charles E. Msonde
EXECUTIVE SECRETARY

1.0 NTRODUCTION

The Primary School Leaving Examination for Mathematics subject was held on 7th of October 2020. In that sitting, a total of 1,023,950 candidates were registered. Out of which 1,009,551 (98.59%) candidates sat for the Mathematics examination. The analysis of the examination results shows that 651,703 (64.64%) candidates passed. In 2019, a total of 932,136 candidates sat for the Mathematics examination, of which 605,588 (64.97%) candidates passed. Thus, the pupil's performance in PSLE 2020 has decreased by 0.33 percent compared to 2019. The comparison of the candidates' performance in each grade for the year 2019 and 2020 is shown in the Figure 1.

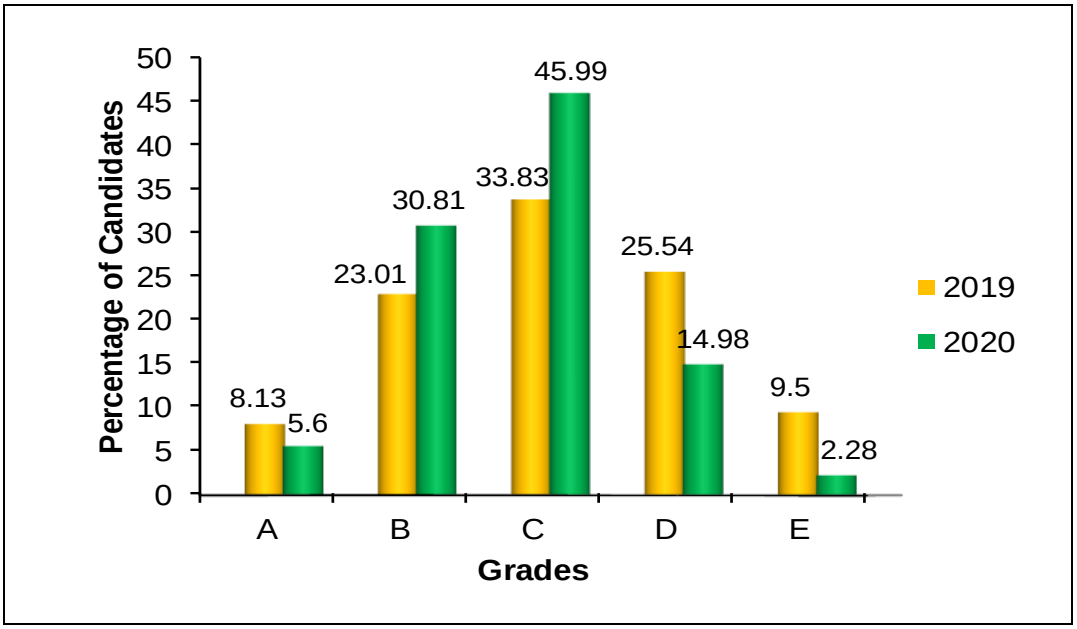


Figure 1: *Comparison of the candidates' performance grades for 2019 and 2020 examinations.*

The Primary School Leaving Examination in Mathematics subject held in 2020 consisted of Sections A and B, with a total of 45 questions covering mathematical operations, figures and word problems. Section A had 40 multiple choice questions carrying 01 mark each, whereas Section B had 5 short answer questions each carrying 02 marks.

The candidates were instructed to answer all questions in both sections. In Section A, the candidates were required to work out the answer in each

question and shade the letter of the correct answer in the Optical Mark Reader (OMR) forms. In Section B, they were required to work out the answer in each question by showing the work in the space provided.

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 percent is categorised as good performance, 40 - 59 percent as average performance and 0 - 39 percent as weak performance. In Section B, the analysis of the candidates' performance was done by considering the percentage of the candidates who scored 0, 1.0 and 2.0 marks.

In this report, tables and charts are used to present data on candidates' performance. In tables and on histograms, asterisk (*) is placed beside the correct answer for the multiple choice questions. Moreover, the word "*Others*" denotes the candidates who either chose more than one option or did not respond to the question. Also, in the analysis tables and figures, the green, yellow and red colours represent good, average and poor performance, respectively.

Finally, the report shows the comparison of candidates' performance topic-wise in 2019 and 2020, and provides recommendations for the improvement of candidates' performance in future.

2.0 ANALYSIS OF THE CANDIDATES' RESPONSES IN EACH QUESTION

The analysis of the candidates' responses was done in each of the examined items from sections A and B. In Section A, the candidates were required to work out the answer for each item and choose the correct answer among the five given options. The analysis was done based on the number of the candidates who chose the correct answers, distracters, candidates who did not follow the given instructions and candidates who omitted the questions.

In Section B, the candidates were required to show the procedures they used to get the answer. In this section, the analysis was done basing on the number of the candidates who scored 0, 1.0 or 2.0 marks and candidates who omitted the question.

2. 1 Section A: Multiple Choice Items

Question 1: $\frac{1}{2}+\frac{1}{3}=$

A $\frac{2}{3}$ B $\frac{3}{5}$ C $\frac{2}{5}$ D $\frac{5}{6}$ E $\frac{1}{6}$.

This question tested the candidates' ability to add simple fractions. The overall performance of the candidates in this question was average as 579,206 (57.25%) candidates were able to choose the correct answer D "$\frac{5}{6}$". Table 1 shows the number and percentage of the candidates for each option.

Table 1: **Number and Percentage of Candidates in each Option**

Option	A	B	C	D*	E	Others
Number of Candidates	41,592	30,440	313,500	579,206	41,882	5,090
Percentage of Candidates	4.11	3.01	30.99	57.25	4.14	0.50

The candidates who chose the correct answer were able to find the common denominator of 2 and 3 which was 6, divide by each

denominator, multiply by numerators and then added the results as follows; $\frac{1}{2}+\frac{1}{3}=\frac{3+2}{6}=\frac{5}{6}$.

However, 427,414 (42.25%) candidates chose the incorrect answers A, B, C or E. These candidates had insufficient knowledge and skills on how to add simple fractions. For example, the candidates who chose the distractor A "$\frac{2}{3}$" divided $\frac{1}{3}$ by $\frac{1}{2}$, those who chose distractor B "$\frac{3}{5}$" added the denominators 2 and 3 then wrote 3 as the numerator of the result, those who chose C "$\frac{2}{5}$" added the numerators and denominators and those who chose the distractor E "$\frac{1}{6}$" multiplied $\frac{1}{2}$ by $\frac{1}{3}$. Besides, 3,234 (0.32%) candidates did not attempt this question while 1,856 (0.18%) candidates failed to follow the given instructions by choosing more than one option.

Question 2: $\frac{1}{4}\div\frac{3}{5}=$

A $\frac{3}{20}$ B $\frac{4}{9}$ C $\frac{5}{12}$ D $\frac{3}{9}$ E $\frac{7}{12}$.

The question tested the candidates' ability to divide simple fractions. Table 2 shows the total number and percentage of the candidates for each option.

Table 2: **Number and Percentage of Candidates for each Option**

Option	A	B	C*	D	E	Others
Number of Candidates	221,094	54,805	662,426	45,848	20,035	7,502
Percentage of Candidates	21.85	5.42	65.48	4.53	1.98	0.74

The candidates' performance in this question was good because 662,426 (65.48%) candidates chose the correct answer C "$\frac{5}{12}$". This indicates that the candidates had sufficient knowledge and skills regarding the division of simple fraction. The candidates who got the correct answer were able to divide simple fractions as follows:

$$\frac{1}{4}\div\frac{3}{5}=\frac{1}{4}\times\frac{5}{3} \qquad \Rightarrow \frac{1\times 5}{4\times 3}=\frac{5}{12}.$$

On the other hand, 341,782 (33.78%) candidates chose one of the distractors A, B, D or E. These candidates failed to remember the rule of dividing simple fractions. For example, the candidates who chose distractor A "$\frac{3}{20}$" multiplied separately the numerators and denominators of the given fractions, those who chose distractor B "$\frac{4}{9}$" added the numerators and the denominators of the give fractions, others who chose D "$\frac{3}{9}$" multiplied the numerators while adding the denominators and those who chose E "$\frac{7}{12}$" added 3 and 4 to get the numerator and multiplied 3 and 4 to get the denominator. Further analysis of the statistical data indicates that, 1,954 (0.19%) candidates ignored the given instructions by choosing more than one option and 5,548 (0.55%) candidates omitted the question.

Question 3: $2.2+13.8+8.9=$

A 24.8 B 24.7 C 24.9 D 23.9 E 24.5.

The question tested the candidates' ability to add decimal numbers having one decimal place. The analysis of the data shows that 886,415 (87.62%) candidates chose the correct answer C "24.9". This indicates that, the candidates had a good performance in the question. The candidates' total number and percentage for each option is shown in Table 3.

Table 3: Number and Percentage of Candidates for Each Option

Option	A	B	C*	D	E	Others
Number of Candidates	30,573	37,141	886,415	41,736	10,314	5,531
Percentage of Candidates	3.02	3.67	87.62	4.13	1.02	0.55

The candidates who did this question correctly had adequate knowledge on addition of decimal numbers. They were able to arrange the given decimal numbers in the required positions before adding as follows:

$$\begin{array}{rr} & 2.2 \\ & 13.8 \\ + & 8.9 \\ \hline & 24.9 \end{array}$$

This arrangement enabled them to add from the right hand side and get the correct answer 24.9.

On the other hand, 119,764 (11.84%) candidates chose the distractors A, B, D and E. These candidates failed to arrange the given decimal numbers in their proper position before adding. For instance, the candidates who chose the distractor A "24.8" added 2 + 8 + 9 of the decimal places to get 1.8 instead of 1.9, those who chose B "24.7" added 8 to 9 in the decimal place and ignore the decimal 2.2, others who chose D "23.9" failed to carry 1 to the unit position after adding the decimal number position. Those who chose E "24.5" did not arrange properly during adding the numbers.

At the same time, 1,591 (0.16%) candidates did not follow the instructions of the question by choosing more than one option, while 3,940 (0.39%) candidates omitted the question.

Question 4: 123.9-11.6=

A 112.3 B 135.5 C 134.5 D 17.9 E 7.9.

The question tested the candidates' ability to subtract decimal numbers. The candidates' performance in this question was good since a total of 918,649 (90.80%) candidates chose the correct

answer A “112.3”. Table 4 shows the number and percentage of candidates for each option.

Table 4: Number and Percentage of Candidates for Each Option

Option	A*	B	C	D	E	Others
Number of Candidates	918,649	43,874	18,640	12,135	13,308	5,104
Percentage of Candidates	90.80	4.34	1.84	1.20	1.32	0.50

The candidates who selected the correct answer had sufficient knowledge and skills in subtracting decimal numbers. They arranged the given numbers in proper position and subtracted correctly as follows;

$$\begin{array}{rr} & 123.9 \\ - & 11.6 \\ \hline & 112.3 \\ \hline \end{array}$$

Despite the candidates' good performance, 87,957 (8.69%) chose the incorrect options B, C, D or E. The candidates who got incorrect answer in this question were unable to perform the subtraction operation in decimal numbers. Some of them changed the operation. Those who chose distractor B “135.5” added the two given numbers instead of subtracting them, meanwhile those who chose C “134.5” added the numbers and forgot to carry 1 from the decimal position of the result, those who chose D “17.9” subtracted 116 from 123.9 but forgot to subtract 1 from 2 in the tens position and those who chose E “7.9”subtracted 116 from 123.9. However, 1,758 (0.17%) candidates responded contrary to the instructions by choosing more than one option and 3,346 (0.33%) candidates did not attempt this question.

Question 5: $\frac{3}{8} \times \frac{1}{4} =$

A $\frac{3}{12}$ B $\frac{4}{12}$ C $\frac{3}{32}$ D $\frac{5}{32}$ E $\frac{4}{32}$.

The question tested the candidates’ ability to multiply simple fractions. The candidates' performance in this question was good since 838,724

(82.90%) candidates chose the correct answer C "$\frac{3}{32}$". The following table shows the candidates' percentage for each option:

Table 5: Number and Percentage of Candidates for Each Option

Option	A	B	C*	D	E	Others
Number of Candidates	49,453	49,995	838,724	29,540	36,908	7,090
Percentage of Candidates	4.89	4.94	82.90	2.92	3.65	0.70

The candidates who responded to the question correctly realized that the given fractions were proper and the requirement was to multiply numerators as well as denominators, i.e.; $\frac{3}{8}\times\frac{1}{4}=\frac{3\times1}{8\times4}=\frac{3}{32}$ to get the correct answer C "$\frac{3}{32}$".

However, 165,896 (16.40%) candidates chose the incorrect alternatives A, B, D or E, 1,947. Those who chose distractor A "$\frac{3}{12}$" multiplied the numerators while adding the denominators of the given fractions. Others who chose B "$\frac{4}{12}$" added the numerators and the denominators while those who chose E "$\frac{4}{32}$" added the numerators and multiplied the denominators separately. On the other hand, 0.19 percent of the candidates ignored the given instructions by choosing more than one option and 5,143 (0.51%) candidates did not respond to this question.

Question 6: $115.7\times13.6=$

A 1,573.52 B 1,572.42 C 1,574.42 D 1,572.52 E 1,573.42.

The question tested the candidates' ability to multiply decimal numbers. A total of 748,335 (73.97%) candidates chose the correct answer A "1,573.52". Therefore, the candidates' performance in this

question was good. Table 6 shows the candidates' percentage for each alternative.

Table 6: Number and Percentage of Candidates for Each Option

Option	A*	B	C	D	E	Others
Number of Candidates	748,335	60,708	59,866	86,668	44,043	12,090
Percentage of Candidates	73.97	6.00	5.92	8.57	4.35	1.20

The candidates who chose the correct answer used properly the long multiplication techniques to attain the answer as they had adequate knowledge on multiplying decimal numbers as follows:

$$\begin{array}{r} 115.7 \\ \times \quad 13.6 \\ \hline 1157 \\ 3471 \\ \quad 6942 \\ \hline 157352 \end{array}$$

Since there are two decimal places in numbers that are multiplied the result is A “1,573.52”.

On the other hand, the analysis shows that 251,285 (24.84%) candidates chose the incorrect alternatives B, C, D or E. These candidates lacked knowledge on how to arrange decimal numbers before multiplying them. Those who chose distractors B “1572.42”, C “1,574.42” and D “1,572.52” failed to carry a number from one position to another during addition. Those who chose E “1,573.42” failed to carry during multiplication of 115.7 and 6. Also, 2,368 (0.23%) candidates answered the question contrary to the given instructions by choosing more than one option and 9,722 (0.96%) candidates omitted this question.

Question 7: 4,801+375=

A 5,616 B 5,176 C 4,176 D 5,166 E 5,716.

The question tested ability of the candidates to perform addition of integers. The analysis of data shows that 926,781 (91.61%) candidates chose the correct answer B "5,176". This shows, the candidates had good performance in this question. The percentage of candidates in each alternative and others are shown in Table 7.

Table 7: Number and Percentage of Candidates for Each Option

Option	A	B*	C	D	E	Others
Number of Candidates	13,007	926,781	32,874	18,110	15,800	5,138
Percentage of Candidates	1.29	91.61	3.25	1.79	1.56	0.51

Table 7 shows that most candidates had adequate knowledge on addition of whole numbers. These candidates were able to use correctly the addition operation in mathematics in order to get the required answer as follows;

$$\begin{array}{r} 4801 \\ +\ 375 \\ \hline 5176 \end{array}$$

The analysis shows that, the candidates were able to answer correctly as they were able to arrange and add properly whole numbers. They were able to add by carrying in thousands, hundreds, tens and ones.

Further analysis of data shows that a total of 79,791 (7.88%) candidates chose the distractors A, C, D or E. The candidates who chose distractor A "5,616" and C "4,176" did not arrange properly the numbers before adding. However those who chose D "5,166" and E "5,716" failed to add properly the unit numbers and tens position of the given numbers. On the other hand, 1,643 (0.16%) candidates chose more than one option and 3,495 (0.35%) candidates omitted this question.

Question 8: 887,967 - 436,856

A 450,001 B 451,001 C 51,011 D 451,111 E 415,111.

The question tested the candidates' ability to subtract integers. The candidates had good performance in this question since 926,245 (91.55%) candidates answered the question correctly. Table 8 shows the candidates' percentage for each alternative.

Table 8: Number and Percentage of Candidates for Each Option

Option	A	B	C	D*	E	Others
Number of Candidates	15,210	26,472	16,867	926,245	21,376	5,540
Percentage of Candidates	1.50	2.62	1.67	91.55	2.11	0.55

The majority of candidates were able to subtract the given integer correctly and chose the correct answer D "451,111".as follows;

$$\begin{array}{rr} & 887967 \\ - & 436856 \\ \hline & 451111 \end{array}$$

On the other hand, 79,925 (7.90%) candidates chose the incorrect answers A, B, C or E. Those who chose distractor A "450,001" and B "451,001" had miss-interpretation that on subtracting 6 from 7, they borrowed 1 from 6 and 9 respectively before subtracting. Those who chose distractor C "51,011" failed to write the correct number in thousands position and those who chose E "415,111" were unable to subtract correctly the given numbers.

Meanwhile, 1,951 (0.19%) candidates did not adhere to the instructions of the paper by opting more than one alternative and 3,589 (0.35%) candidates did not attempt this question.

Question 9: 86×107=

A 9,202 B 9,102 C 8,202 D 8,102 E 9,302.

The question tested the ability of candidates to perform multiplication on integers. The data analysis shows that 776,408 (76.74%) candidates chose the correct answer A "9,202". Therefore, the

candidates' performance in this question was good. Table 9 shows the candidates' percentage for each option.

Table 9: Number and Percentage of Candidates for Each Option

Option	A*	B	C	D	E	Others
Number of Candidates	776,408	82,691	61,436	38,525	43,074	9,576
Percentage of Candidates	76.74	8.17	6.07	3.81	4.26	0.95

The candidates who answered this question correctly were able to apply long multiplication techniques and addition of numbers to attain the required answer as follows:

$$\begin{array}{r} 86 \\ \times\ 107 \\ \hline 602 \\ 00 \\ +\,86 \\ \hline 9202 \\ \hline \end{array}$$

.

This shows that, these candidates had adequate knowledge on the concept of multiplication of whole numbers.

On the other hand, 225,726 (22.31%) candidates chose the distractors B, C, D or E. For instance, candidates who chose B "9,102" failed to carry a unit from hundreds to thousands. Further analysis shows that, a total of 2,500 (0.25%) candidates ignored the given instructions by choosing more than one option and 7,076 (0.70%) candidates did not attempt this question.

Question 10: If $a = 2$, $b = 4$ and $c = 1$, find the value of $\frac{b^2 - a}{c}$.

A 6 B 14 C 18 D 0 E 4.

The question tested the candidates' competence in performing mathematical operations especially multiplication, subtraction and division on whole numbers in finding the value of an expression. The analysis of data shows that, 611,611 (60.45%) candidates did this

question correctly indicating a good performance. The following table shows the percentage of candidates in each option.

Table 10: Number and Percentage of Candidates for Each Option

Option	A	B*	C	D	E	Others
Number of Candidates	174,670	611,611	70,440	56,446	89,168	9,375
Percentage of Candidates	17.26	60.45	6.96	5.58	8.81	0.93

The analysis of data shows that, 611,611 (60.45%) candidates were able to multiply, subtract and divide the resulting values correctly i.e.; $\frac{b^2 - a}{c} = \frac{4^2 - 2}{1} = \frac{16 - 2}{1} = 14$.

Further analysis of data shows that 390,724 (38.62%) candidates chose the incorrect answers A, C, D or E. Those who chose distractor A "6" wrongly multiplied 4 by 2 for b^2, those who chose distractor C "18" determined the square of 4 plus 2, those who chose D "0" were confusing the values of the given letters by substituting wrong data on the formula and those who chose E "4" failed to multiply correctly the given data for b^2. Also 2,831 (0.28%) candidates ignored the given instructions by choosing more than one option and 6,544 (0.65%) candidates omitted this question.

Question 11: Compute the value of $^{+}56 + ^{+}2 - \left(^{-}63 + ^{+}13\right) + ^{-}8 \times ^{+}5$

A +48 B +68 C -48 D -68 E +58.

The question tested the candidates' competence in performing mathematical operations involving positive (+) and negative (-) numbers with regard to the "Brackets, Orders, Division, Multiplication, Addition and Subtraction (BODMAS)" rule. The performance of the candidates in this question was weak because 371,057 (36.68%) candidates chose the correct option B "+68". Figure 2 shows the percentages of candidates for each option.

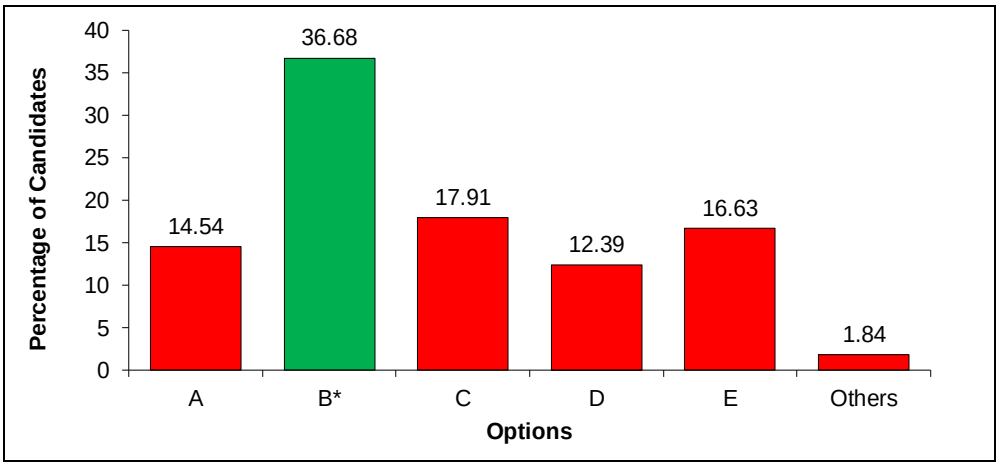


Figure 2: *Percentages of Candidates for Each Option*

This Figure indicates that most of the candidates 640,653 (63.32%) failed to remember the rule of Brackets, Orders, Division, Multiplication, Addition and Subtraction with regard to the status of the given numbers, whether positive or negative when performing the mathematical operations required. Those who chose distractor A, "+48" failed to follow the BODMAS rule by ignoring the steps to begin with and the one to end with. Those who chose C "-48" failed to simplify properly the given expression with respect to the sign indicated, the candidates who chose distractor D "-68" failed to differentiate between negative and positive sign and those who chose E "+58" used only positive sign during simplification of the expression.

Though the performance was weak, a total of 371,057 (36.68%) candidates chose the correct answer B "+68". They were able to simplify the given expression while considering the positive and negative numbers during operations as follows;

$$^{+}56 +^{+} 2 - (^{-}63 +^{+} 13) +^{-} 8 \times^{+} 5$$

$$=^{+} 56 +^{+} 2 - (^{-}50) +^{-} 8 \times^{+} 5$$

$$=^{+} 56 +^{+} 2 + 50 + (^{-}40)$$

$$=^{+} 108 + (^{-}40)$$

$$=^{+} 108 +^{-} 40$$

$$=^{+} 68$$

This enabled them to choose the correct option B "+68" as they were competent in applying the BODMAS rule.

Question 12: List all even numbers between 64 and 75.

A 65, 70

B 66, 69, 72

C 67, 71, 73

D 66, 68, 70, 72, 74

E 65, 67, 69, 71, 73

The question tested the candidates' ability to remember and list even numbers. The analysis of data shows that 753,095 (74.44%) candidates chose the correct answer D "66, 68, 70, 72, 74". Therefore, the performance of candidates in this question was good. Figure 3 shows the percentages of candidates for each alternative.

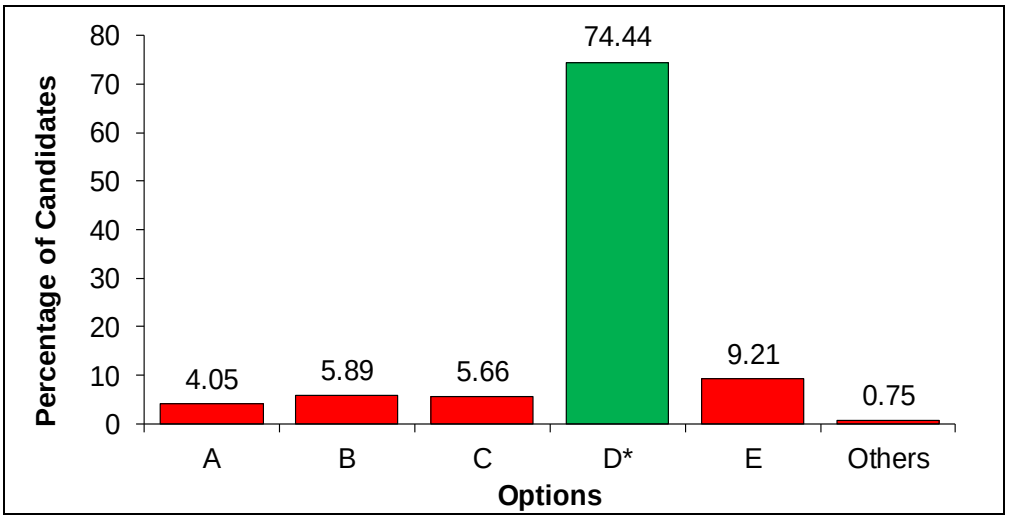


Figure 3: *Percentages of Candidates for Each Option*

In this question many candidates (74.44%) had adequate knowledge about even numbers as they listed them correctly as 66, 68, 70, 72 and 74.

On the other hand, a total of 251,009 (24.81%) candidates opted for the distractors A, B, C or E. These candidates had insufficient knowledge about even numbers. For example, those who chose A “65, 70” could not distinguish between even and numbers divisible by 5. In addition, those who chose B “66, 69, 72” failed to recognise the difference between even and numbers divisible by 3, those who chose C “67, 71, 73” were not able to distinguish even from odd numbers and those who chose E “65, 67, 69, 71, 73” were not able to differentiate even from odd numbers.

Question 13: Find the Lowest Common Multiple (LCM) of 12 and 15.

A 27 B 3 C 1 D 60 E 120.

The question tested the ability and competence of the candidates to find the Lowest Common Multiple of two numbers. The analysis of data shows that 694,090 (68.61%) candidates chose the correct answer. Therefore, the performance of candidates in this question was good. The percentages of the candidates for each option are shown in Figure 4.

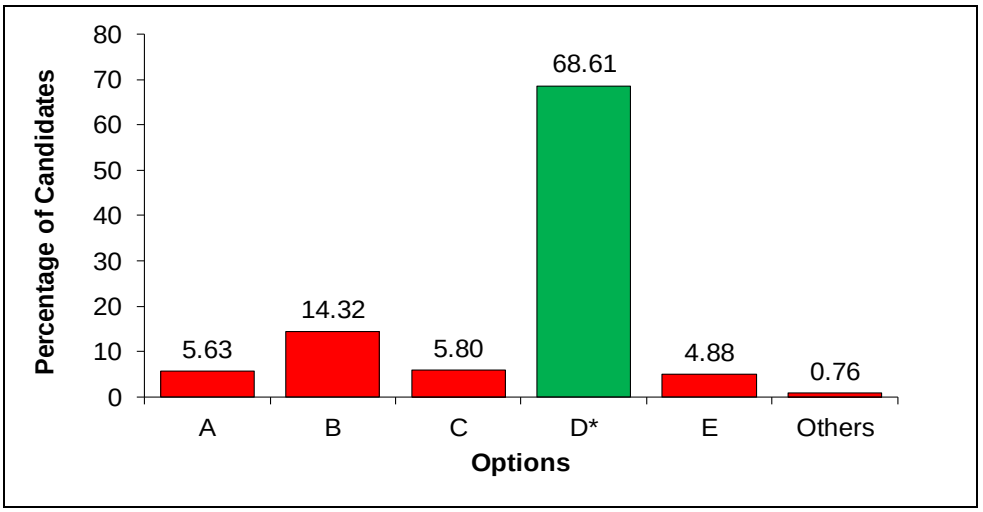


Figure 4: *Percentages of Candidates for Each Option*

The candidates with sufficient knowledge and skills on finding the Lowest Common Multiple of numbers managed to find the LCM of 12

and 15 by listing the multiples of each number separately before they picked the lowest which appeared from both of the two established lists as follows;

$$12 = 12,\ 24,\ 36,\ 48, 60, 72, ...$$
$$15 = 15,\ 30,\ 45,\ 60, 75, ...$$

Since the multiple of 12 and 15 that appears in both list is 60, therefore, the candidates chose the correct answer D “60”.

However, 309,929 (30.63%) candidates were not able to find the LCM of 12 and 15. The candidates who chose A “27” added 12 and 15, those who chose B “3” determined the GCF of 12 and 15, the candidate who chose C “1” determined the smallest common factor of both two numbers and those who chose E “120” could not differentiate between LCM and a common multiple of numbers. Meanwhile, 2,726 (0.27%) candidates ignored the instructions of the paper by choosing more than one option and 4,965 (0.49%) candidates omitted this question.

Question 14: Change the number 25.25% into simplest fraction.

A $25\frac{1}{4}$ B $\frac{25}{400}$ C $\frac{25.25}{400}$ D $\frac{110}{400}$ E $\frac{101}{400}$.

The question tested the candidates’ ability to change the number from percentage to simple fraction. The analysis of data shows that 379,545 (37.52%) candidates chose E “$\frac{101}{400}$”. This indicates that the performance in this question was weak. The percentages of candidates for each option are shown in Figure 5.

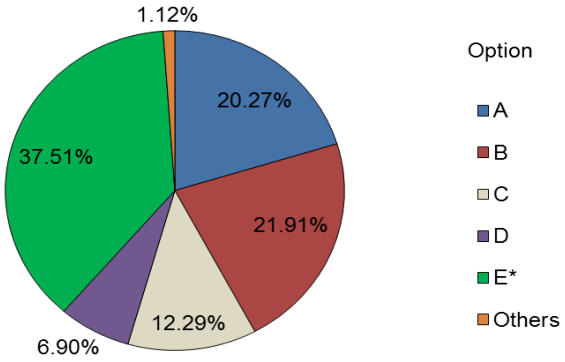


Figure 5: *Percentages of Candidates for Each Option*

As shown in Figure 5, a total of 632,165 (62.48%) candidates chose the wrong answers A, B, C, D and others. Therefore, the candidates' performance in this question was weak. Majority of the candidates failed to change the number from percentage to simple fraction. Those who chose A "$25\frac{1}{4}$" were unable to change the percentage into decimal number, those who chose B "$\frac{25}{400}$" and C "$\frac{25.25}{400}$" failed to add the whole number and the decimal in order to make the fraction and those who chose D "$\frac{110}{400}$" failed to simplify the number $\frac{2525}{10000}$ by dividing by 25 to both the numerator and denominator.

On the other hand, 379,545 (37.52%) candidates chose the correct option E "$\frac{101}{400}$". This indicates that only a few candidates had ability of changing percentage into fraction. These were able to change the given number by applying the correct procedures as follows;

$$\begin{aligned} 25.25\% &= 25\frac{1}{4} \div 100 \\ &= \frac{101}{4} \div 100 \\ &= \frac{101}{4} \times \frac{1}{100} \\ &= \frac{101}{400}. \end{aligned}$$

Moreover, 2,766 (0.27%) selected more than one answer while 8,520 (0.84%) did not answer the question.

Question 15: Find the value of a if $\frac{4}{5}a - 2 = 10$.

A 1.5 B -10 C -15 D 15 E 10.

The question tested the candidates' ability to solve the given equation. The analysis of data shows that 467,493 (46.21%) candidates solved the question correctly. Hence, the candidates' performance in this question was average. The percentages of candidates for each option are shown in Figure 6.

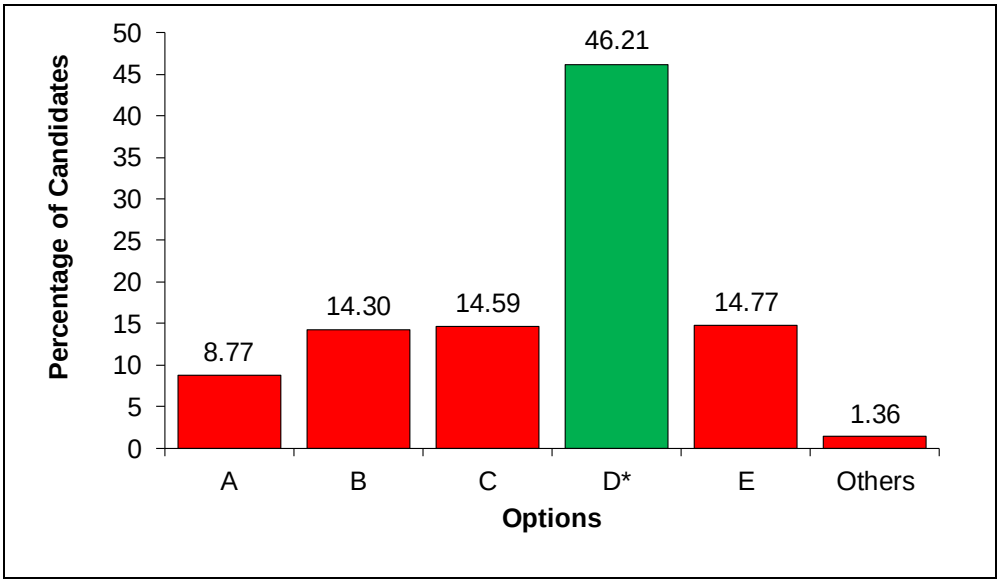


Figure 6: *Percentages of Candidates for Each Option*

The candidates who answered this question correctly were able to solve the equation by following all the required procedures in order to get the value of a as follows;

$$\frac{4}{5}a - 2 = 10$$

thus, $5 \times \frac{4}{5}a - 2 \times 5 = 10 \times 5$

$$4a - 10 = 50$$

$$4a - 10 + 10 = 50 + 10$$

$$4a = 60$$

$$\frac{4}{4}a = \frac{60}{4}$$

$$a = 15.$$

On the other hand, a total of 530,465 (52.43%) candidates chose the wrong options A, B, C or E. Those who chose distractor A "1.5" failed to divide correctly the product of 4 and *a*, the candidates who chose B "-10" and C "-15" used the negative and positive sign wrongly, and those who chose E "10" could not balance the equation by adding 2 both sides.

Further analysis shows that, 2,183 (0.22%) candidates chose more than one option and 11,569 (1.14%) candidates omitted this question.

Question 16: Find the square of 19.

A 361 B 281 C 381 D 261 E 161.

This question tested the candidates' ability to calculate the square of a given number. The analysis of statistics shows that 770,993 (76.21%) candidates chose A "361". This indicates that the candidates' performance in this question was good. The percentages of candidates and their options are shown in Figure 7.

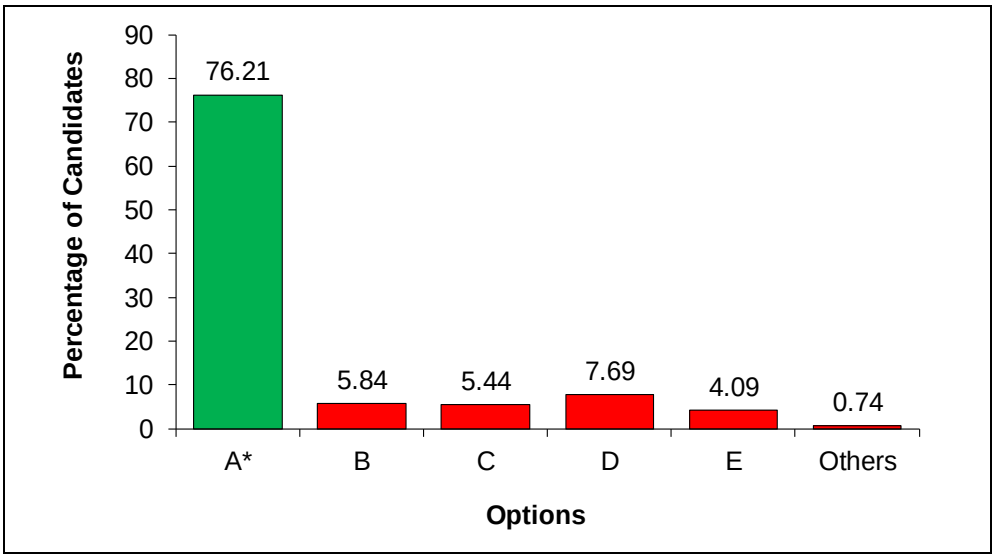


Figure 7: *Percentage of Candidates for Each Option*

The analysis of data shows that the candidates' performance in this question was good. A total of 770,993 (76.21%) candidates were able to calculate the square of 19 and managed to choose the correct answer A "361". These candidates showed a good understanding on how to calculate the square of a given number since they showed the simple procedures to find it as follows;

$$19^2 = 19 \times 19$$
$$= 361$$

On the other hand, 233,242 candidates equivalent to 23.05 percent lacked skills on how to calculate the square of a number and hence they chose the incorrect answers B, C, D or E. For instance, those who chose the distractors B "281" and C "381" failed to perform properly the addition process in multiplication of 19 by 19 and those who chose D "261" and E "161" failed to arrange correctly during multiplying 19 by itself. Also, 2,531 (0.25%) candidates opted for more than one alternative and 4,944 (0.49%) candidates omitted this question.

Question 17: Change the Roman number CMXL into normal numeral.

A 950 B 960 C 1,160 D 940 E 1,140.

This question tested the candidates' ability to change Roman numbers into Arabic numbers. The percentages of candidates as well as their options are shown in Figure 8.

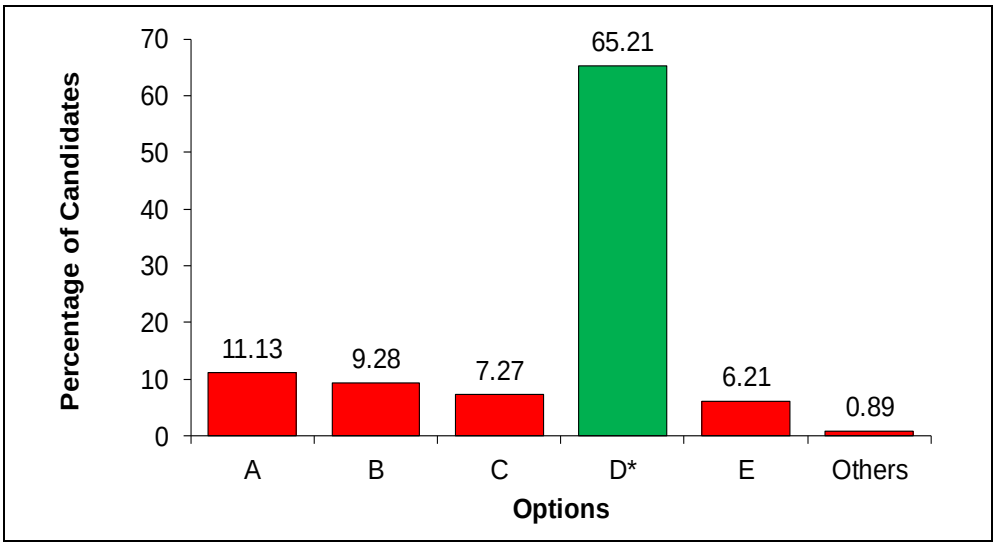


Figure 8: *Percentages of Candidates for Each Option*

The performance of candidates in this question was good as 65.21 percent of the candidates were able to change the Roman number into normal number and chose the correct option D "940". They knew that the letters used in Roman numbers represents the Arabic numbers as follows:

C = 100, M = 1,000, X = 10 and L = 50, they also knew the rule used to write the numbers from Roman to Arabic as follow; CM = 900 and XL = 40.

Despite the good performance, 245,571 (26.32%) candidates were unable to change the given Roman number into normal number and therefore they chose either A, B, C or E which are incorrect answers. For example, those who chose A "950" and B "960" failed to know the meaning of XL as equal to 40, they knew it was 50 and 60 respectively, while those who chose distractors C "1,160" and E "1,140" added the values of the letters defined above without following the rules for writing Roman numbers. Furthermore, 3,043 (0.30%) candidates wrote more than one answer and 5,982 (0.59%) candidates did not answer this question.

Question 18: Find the value of B if A: B = 9: 15 and $A = 81$.

A 135 B 115 C 125 D 145 E 155.

This question tested the candidates' ability to determine the value of a letter in a given ratio of numbers. The analysis of data shows that 576,625 (57.00%) candidates chose the correct answer A "135". Therefore the candidates' performance in this question was good. Figure 9 shows the percentages of candidates for each option.

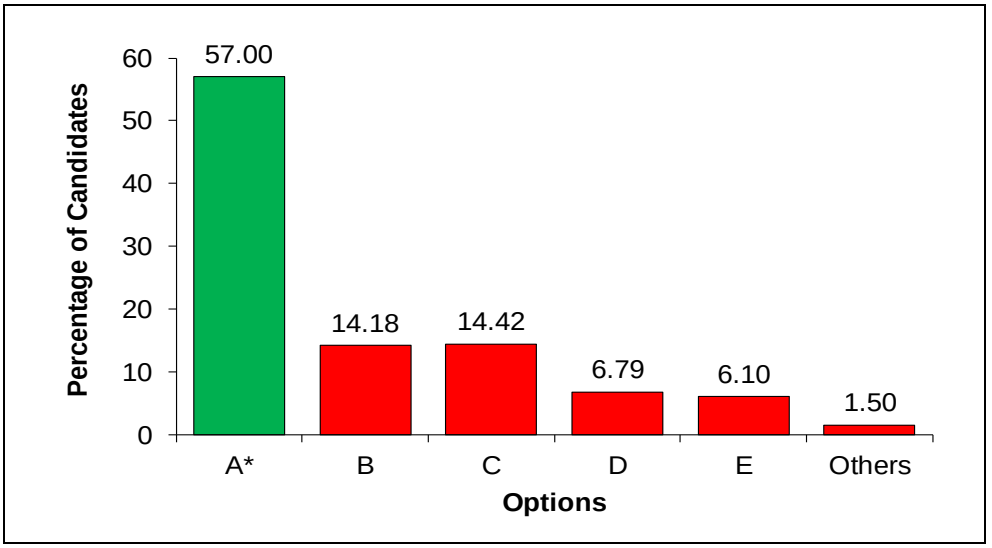


Figure 9*: Percentages of Candidates for Each Option*

The analysis of data shows that 576,625 (57.00%) candidates showed that they were competent in determining the ratio of the given numbers. Such candidates were able to show step by step the relationship of the ratios and managed to get the value of B as shown below;

$$A:B=9:15 \text{ and } A=81$$

$$\frac{A}{B}=\frac{9}{15}$$

$$\frac{81}{B}=\frac{9}{15}$$

$$9B=81\times 15$$

$$9B=1215$$

$$B=\frac{1215}{9}$$

$$\therefore B=135$$

However, the analysis of data shows that there were 419,874 (41.50%) candidates who failed to determine the ratio of the given number and got the wrong value of B. These candidates chose distractors B, C, D or E. The candidates who chose distractor B “115” multiplied 9 and 15. Moreover, the candidates who chose C “125”, D “145” or E “155” failed to add to tens the number which was carried from ones. Moreover, 2,560 (0.25%) candidates chose more than one option, while 12,651 (1.25%) candidates did not answer the question.

Question 19: Find the Highest Common Factor (H.C.F) of 24 and 36.

A 72 B 60 C 6 D 144 E 12.

This question tested the candidates’ ability to find the Highest Common Factor of two numbers. The analysis of data shows that 641,133 (63.37%) candidates chose the correct answer. This reveals that the candidate’s performance in this question was good. The percentages of candidates with their options are shown in Figure 10.

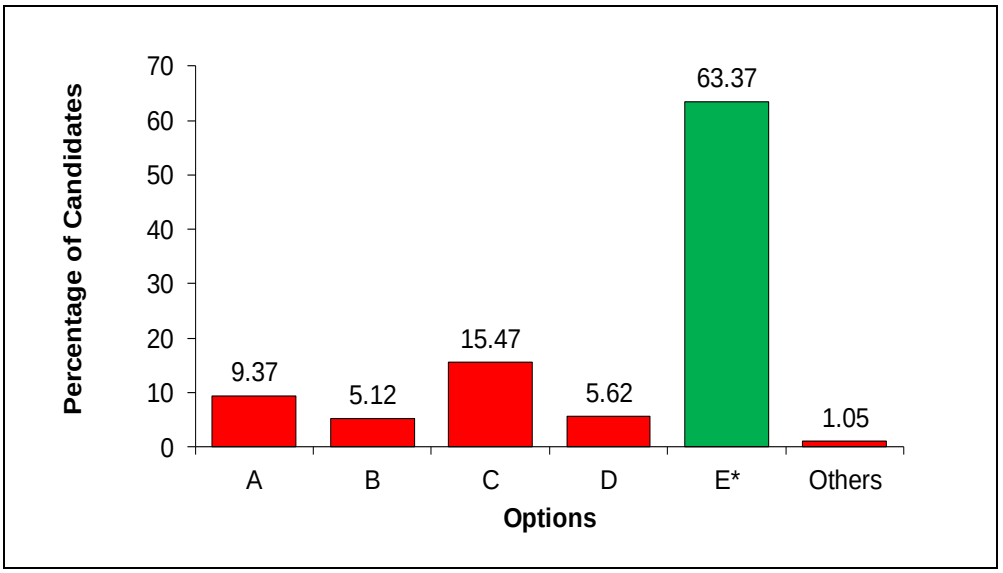


Figure 10*: Percentages of Candidates for Each Option*

The analysis of data shows that a total of 641,133 candidates, equivalent to 63.37 percent, were able to find the H.C.F of the numbers 24 and 36, hence chose the correct answer E “12”. The correct answer was obtained by listing the factors of each number separately before picking the required factor (H.C.F) as follows:

24 = 1, 2, 3, 4, 6, 8, 12, 24.

36 = 1, 2, 3, 4, 6, 9, 12, 18, 36.

∴ H.C.F = 12

Further, analysis shows that 503,457 candidates, equivalent to 53.95 percent, chose either the distractor A, B, C or D. These candidates had insufficient knowledge on how to find the H.C.F of two numbers. For example, those who chose A "72" were not able to distinguish between LCM and GCF of 36 and 24 thus they found LCM instead of GCF. Those who chose B "60" wrote the sum of the two numbers, the candidates who chose C "6" could not distinguish between a common factor and the GCF of two numbers, and those who chose D "144" determined a common multiple of two numbers which also shows a misconception of students between a multiple of numbers and the least common multiple of numbers.

Question 20:

	Km	m
	105	105
-	5	200

A 99 Km 905 m B 99 Km 805 m

C 99 Km 705 m D 99 Km 950 m

E 99 Km 705 m.

This question tested the candidates' ability to identify and solve questions involving metric measurements. The analysis of data shows that 798,235 (78.90%) chose the correct answer A "Km 99 m 905". This indicates that the candidates' performance in this question was good. The percentages of the candidates with their options are shown in Figure 11.

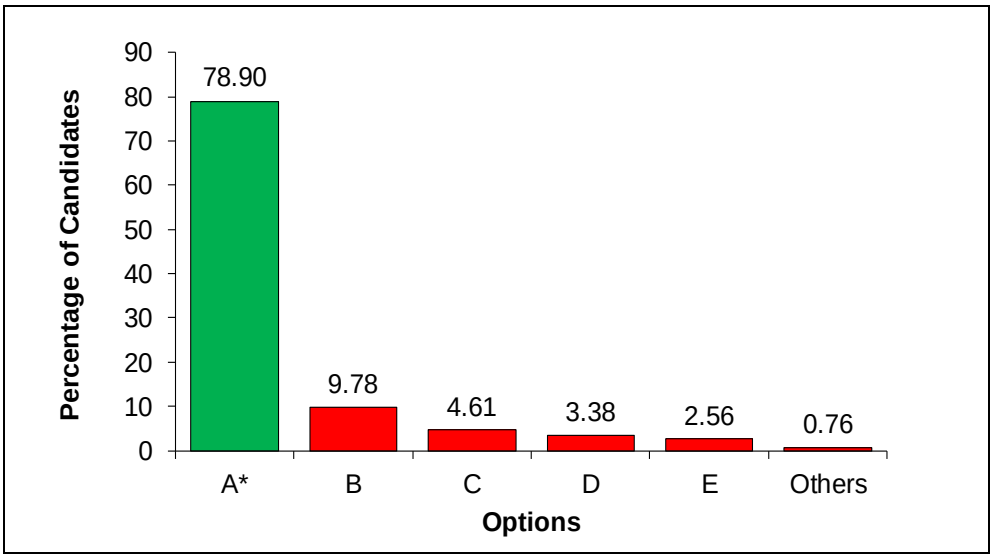


Figure 11: *Percentage of Candidates for Each Option*

The analysis of data shows that 798,235 (78.90%) candidates were able to follow the procedures of calculating and changing the given measurements correctly. This shows that, they had adequate skills in converting the given measurements from Km to m as follows:

	Km	m
	105	105
-	5	200

$\Rightarrow$

	Km	m
	104	1105
-	5	200
	99	905

.

On the other hand, 205,754 candidates, equivalent to 20.34 percent, chose the incorrect options B, C, D or E. These candidates lacked knowledge on calculating and changing the measurements as required. They failed to relate *Km* to *m*. On the other hand, 2,570 (0.25%) candidates chose more than one option, while 5,151 (0.51%) candidates did not answer this question.

Question 21: Write the missing number in the following sequence:

$$3, 1, \frac{1}{3}, \frac{1}{9} \ldots$$

A $\frac{1}{18}$ B $\frac{1}{27}$ C $\frac{1}{81}$ D $\frac{1}{12}$ E $\frac{1}{15}$.

This question tested the candidates' ability to identify and write the missing number in a sequence of numbers. The analysis of data shows that 365,912 (36.17%) chose the correct answer B "$\frac{1}{27}$". This reveals that the performance of candidates in this question was weak.

The options, total number and percentage of candidates are shown in Table 11.

Table 11: Number and Percentage of Candidates for Each Option

Option	A	B*	C	D	E	Others
Number of Candidates	96,527	365,912	167,003	231,240	140,360	10,668
Percentage of Candidates	9.54	36.17	16.51	22.86	13.87	1.05

The analysis of data shows that the candidates' performance in this question was weak as 62.78 percent of the candidates who attempted this question failed to get the correct answer. These candidates lacked the knowledge and skills of identifying the missing number. The candidates who chose A "$\frac{1}{18}$" multiplied the denominator by 2, those who chose C "$\frac{1}{81}$" multiplied the denominator by 9, while those who chose distractor D "$\frac{1}{12}$" added 3 to the denominator and those who chose E "$\frac{1}{15}$" added the difference between 3 and 9 to the denominator.

On the other hand, there were 365,912 (36.17%) candidates who managed to get the correct answer B "$\frac{1}{27}$". This answer was obtained after dividing the preceding number by 3 to get the next number. Moreover, 3,672 (0.36%) candidates wrote more than one answer, while 6,996 (0.69%) candidates did not answer the question.

Question 22: Simplify; $-3(y+x)-2y$.

A $-3y-2x+2y$ B $-5y-3x$ C $5y-3x$

D $-3y-3x-2y$ E $-5y+3x$.

This question tested the candidates' ability to apply the BODMAS rule in simplifying the algebraic expression. The analysis shows that 363,640 (35.94%) chose the correct option B "$-5y-3x$". This indicates the performance of candidates in this question was weak. The options, number and percentage of candidates are shown in Table 12.

Table 12: Number and Percentage of Candidates for Each Option

Option	A	B*	C	D	E	Others
Number of Candidates	127,558	363,640	190,710	140,110	178,821	10,871
Percentage of Candidates	12.61	35.94	18.85	13.85	17.68	1.07

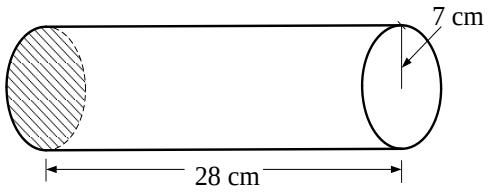
There were 637,199 (62.99%) candidates who chose the incorrect answers A, C, D or E. The candidates failed to open the brackets and combine the terms with the same sign like (+ or -) in the given expression. Those who chose A "$-3y-2x+2y$" confused the use of positive and negative signs, the candidates who chose C "$5y-3x$" misused the positive and negative signs, while those who chose D "$-3y-3x-2y$" failed to collect together the like terms in the given expression and those who chose E "$-5y+3x$" failed to use properly the operation signs in the given expression.

However, there were 363,640 (35.94%) candidates who chose the correct option. They managed to simplify correctly the expression as follows;

$$\begin{aligned} &-3(y+x)-2y \\ &= -3y-3x-2y \\ &= -3y-2y-3x \\ &= -5y-3x. \end{aligned}$$

In addition, there were 3,371 (0.33%) candidates who chose more than one option and 7,500 (0.74%) candidates omitted this question.

Question 23: Find the surface area of this cylinder which is open on one side $\left(\text{use } \pi = \frac{22}{7}\right)$.



A $1,254\,cm^2$ B $1,354cm^2$ C $1,286cm^2$
D $1,232cm^2$ E $1,386cm^2$.

This question tested the candidates' ability to find the area of cylinder which is open on one side by using the relevant formula. The analysis shows that 289,270 (28.59%) chose the correct option E "1,386 cm^2". This indicates the performance of candidates in this question was weak. The total number and percentages of the candidates including their responses are shown in Table 13.

Table 13: Number and Percentage of Candidates for Each Option

Option	A	B	C	D	E*	Others
Number of Candidates	130,816	172,438	184,343	214,064	289,270	20,779
Percentage of Candidates	12.93	17.04	18.22	21.16	28.59	2.05

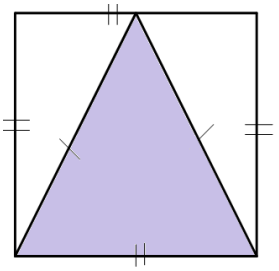
The analysis of data shows that the candidates' performance in this question was weak. A total of 701,661 (69.35%) candidates chose the distractors A, B, C or D. These candidates failed to use the correct formula for finding the area of a cylinder. For instance, the candidates who chose the distractor A "$1,254\,cm^2$" used a wrong formula. Those who chose distractor B "$1,354cm^2$" and C "$1,286cm^2$" made mistakes in performing mathematical operations while those who chose distractor D" $1,232cm^2$" did not add the area of the circular base.

However, 289,270 (28.59%) candidates were able to find the area of a cylinder by applying the correct formula and hence they chose the correct answer E "$1,386cm^2$". The candidates solved the question as follows:

$$
\begin{aligned}
&= 2\left(\frac{22}{7}\times 7cm\times 28cm\right)+\left(\frac{22}{7}\times 7cm\times 7cm\right)\\
&= 1,232cm^2+154cm^2\\
&= 1,386cm^2.
\end{aligned}
$$

On the other hand, there were 3,211 (0.32%) candidates who chose more than one option and 17,568 (1.74%) candidates who omitted this question.

Question 24: Find the shaded area if the isosceles triangle inside the square has a height of 8 cm.



A $64\,cm^2$ B $16cm^2$ C $32cm^2$

D $36cm^2$ E $24cm^2$.

This question tested the candidates' ability to find the shaded area of the isosceles triangle inside the square. The analysis shows that 449,400 (44.42%) chose the correct option C "$32cm^2$". This indicates the performance of candidates in this question was average. The total number and percentage of candidates and their options are shown in Table. 14.

Table 14: Number and Percentage of Candidates for Each Option

Option	A	B	C*	D	E	Others
Number of Candidates	247,392	159,447	449,400	60,428	84,896	10,147
Percentage of Candidates	24.45	15.76	44.42	5.97	8.39	1.00

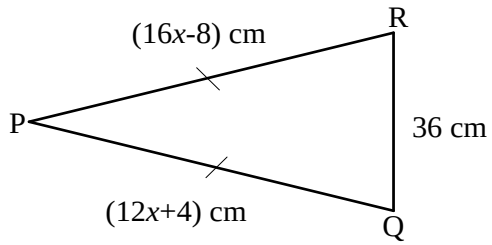
The data analysis shows that the candidates' performance in this question was average. A total of 449,400 candidates, equivalent to 44.42 percent, correctly applied the formula for finding the area of a triangle as follows:

$$\text{Area} = \frac{1}{2}\text{bh} = \frac{1}{2} \times 8 \times 8 = 32\text{cm}^2.$$

However, 552,163 (54.58%) candidates failed to find the shaded area of the isosceles triangle inside the square. Thus, they chose the incorrect option A, B, D or E. They were unable to identify the base and the correct formula. For example, the candidates who chose the distractor A "$64\,cm^2$" failed to calculate correctly the area of the square before determining the shaded area. Those who chose

distractor B "16cm^2" applied the correct formula, but they used wrong data. The candidates who chose D "36cm^2" failed to multiply correctly the given units of the square and those who chose distractor E "24cm^2" multiplied 8 by 3 which is a wrong procedure. On the other hand, 3,021 (0.30%) candidates chose more than one option, while 7,126 (0.70%) omitted this question.

Question 25: Find the perimeter of isosceles triangle PQR.



A 116 cm B 80 cm C 3 cm D 40cm E 76cm .

This question tested the candidates' ability to find the perimeter of an isosceles triangle. The analysis shows that 410,426 (40.57%) chose the correct option A "116 cm". This indicates that the performance of candidates in this question was average. The total number and percentage of the candidates with their responses are shown in Table 15.

Table 15: Number and Percentage of Candidates for Each Option

Option	A*	B	C	D	E	Others
Number of Candidates	410,426	163,683	134,206	147,274	137,558	18,563
Percentage of Candidates	40.57	16.18	13.27	14.56	13.60	1.83

The analysis of data shows that 410,426 (40.57%) candidates were able to calculate the perimeter of an isosceles triangle. Therefore, they chose the correct answer A "116 cm".

$$16x - 8 = 12x + 4$$

$$16x = 12x + 4 + 8$$

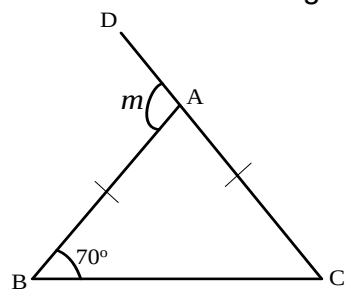
$4x = 12$

$x = 3$

Perimeter $= PR + RQ + PQ$
$= (16 \times 3 - 8)cm + (12 \times 3 + 4)cm + 36cm = sm40 + sm40 + sm36$
$= 116cm.$

However, a total of 582,721 (57.60%) chose the incorrect options B, C, D or E. These candidates failed to apply the correct formula for finding the perimeter of isosceles triangle. For example, the candidates who chose the option B "80cm" failed to add the two sides of the isosceles, those who chose C "3cm", calculated the value of *x* without finding the perimeter. The candidates who chose D "40cm" failed to find the length of one side of the Figure and those who chose distractor E "76cm" were unable to add the two similar sides to the base of the isosceles given. Furthermore, 3,431 (0.34%) candidates chose more than one option and 15,132 (1.50%) candidates did not attempt this question.

Question 26: Find the value of angle *m* in the following Figure:



A 110^{o} B 55^{o} C 100^{o} D 140^{o} E 125^{o}.

This question tested the candidates' competence to find the value of an angle in a triangular figure. The analysis shows that 475,648 (47.01%) chose the correct option D "140^{0}". This indicates the performance of candidates in this question was average. The total number and percentage of candidates including their responses are shown in Table 16.

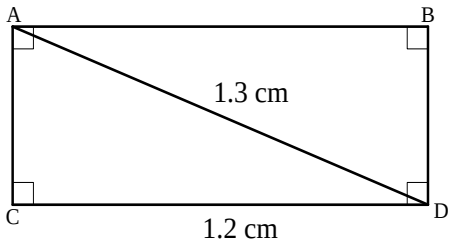
Table 16: Number and Percentage of Candidates for Each Option

Option	A	B	C	D*	E	Others
Number of Candidates	295,220	100,487	77,715	475,648	52,646	9,994
Percentage of Candidates	29.18	9.93	7.68	47.01	5.20	0.99

The analysis of data shows 475,648 (47.01%) candidates were able to work out the answer for this question and choose the correct answer D. Such candidates were able to remember that the angle $BAD = 180^{o} - 40^{o}$ according to the diagram. Thus, they correctly calculated it to get $m = 140^{o}$.

Despite the average performance, 526,068 (52.00%) candidates chose the incorrect answers A, B, C or E. These candidates lacked knowledge on angles formed in a triangle and how they are found. For instance, those who chose distractor A "110^{o}" determined the sum of BAC and BCA instead of side BAD, those who chose B "55^{o}"considered angle m as half of the total of angle BAC and BCA, those who chose C "100^{o}" multiplied 70^{o} by 2 then subtracted 40^{o} and those who chose E "125^{o}" determined the sum of $\frac{1}{2}(180^{o} - ABC)$ and BCA. Furthermore, 3,636 (0.36%) candidates chose more than one option and 6,358 (0.63%) candidates omitted this question.

Question 27: Find the area of the following rectangle:



A $0.5\,cm^2$ B $0.65cm^2$ C $0.6cm^2$ D $0.3cm^2$ E $0.78cm^2$.

This question tested the candidate's ability to find the area of a rectangle. The analysis shows that 424,328 (41.94%) chose the

correct option C "0.6 cm^2". This indicates the performance of candidates in this question was weak. The total number, percentage and options are shown in Table 17.

Table 17: Number and Percentage of Candidates for Each Option

Option	A	B	C*	D	E	Others
Number of Candidates	189,583	182,139	424,328	105,711	95,188	14,761
Percentage of Candidates	18.74	18.00	41.94	10.45	9.41	1.46

The analysis of data shows that 424,328 (41.94%) were able to use the correct formula for calculating the area of a rectangle with the help of Pythagoras theorem.

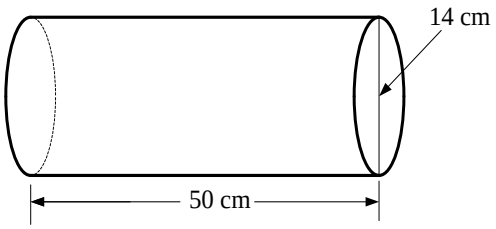
Height of triangle, AC $= \sqrt{AC^2 - CD^2}$

$= \sqrt{1.69 - 1.44} = \sqrt{0.25} = 0.5\text{cm}$

Area of rectangle ABCD $= 2\left(\frac{1}{2} AC \times CD\right) = 0.5 \times 1.2 = 0.6\ \text{cm}^2$.

On the other hand, a total of 572,624 (56.60%) were unable to find the area of the rectangle due to incorrect use of the required formula for finding area of rectangles. Some of them calculated the height of the rectangle which was 0.5 cm and conclude it to be the area required by choosing distractor A "$0.5\,\text{cm}^2$", those who chose B "$0.65\,\text{cm}^2$" failed to find the value of the height of the rectangle given. The candidates who chose distractor D "$0.3\,\text{cm}^2$" were unable to find the square root after multiplying the measurements of the rectangle and those who chose E "0.78cm^2" failed to multiply correctly the base and height of the rectangle. Moreover, 2,707 (0.27%) candidates did not abide by the given instructions by choosing more than one options while 12,054 (1.19%) candidates did not answer this question.

Question 28: Find the volume of the following cylinder $\left(\text{use } \pi = \frac{22}{7}\right)$.



A $7,500\,cm^3$ B $7,700cm^3$ C $5,700cm^3$

D $30,800cm^3$ E $30,500cm^3$.

The question tested candidates' ability to find the volume of a cylinder. The analysis shows that 505,259 (49.94%) chose the correct option B "sm^3 7,700". This indicates the performance of candidates in this question was average. The total number and percentage of the candidates and their responses are shown in Table 18.

Table 18: Number and Percentage of Candidates for Each Option

Option	A	B*	C	D	E	Others
Number of Candidates	121,546	505,259	129,545	179,364	64,078	11,918
Percentage of Candidates	12.01	49.94	12.80	17.73	6.33	1.18

The analysis of the candidates' responses shows that the performance on this question was average since 505,259 (49.94%) candidates did it correctly. These candidates were able to apply correctly the formula for determining the volume of a cylinder as follows;

$$\text{The volume of a cylinder} = \pi \frac{d^2}{4} h$$

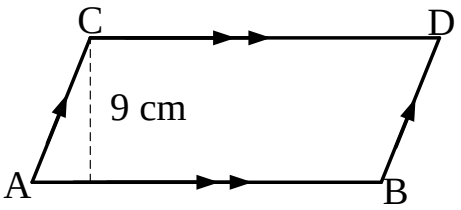
$$= \frac{22}{7} \times \frac{14cm \times 14cm}{4} \times 50cm$$

$$= 154cm^2 \times 50cm^2$$

$$\therefore \text{Volume} = 7,700cm^3$$

However, 494,533 candidates, equivalent to 48.88 percent, chose the wrong distractors A, C, D or E. These candidates were unable to apply correctly the formula for finding the volume of a cylinder. Some of them applied a wrong formula and failed to make correct substitution of data into the formula. Those who chose option A "$7,500\,cm^3$" and C "$5,700cm^3$" failed to perform multiplication and division. Those who chose D "$30,800cm^3$" and E "$30,500cm^3$" were unable to divide the product of multiplication to 4. In addition, there were also 2,058 (0.20%) candidates who chose more than one option and 9,860 (0.97%) candidates who omitted this question.

Question 29: The area of the following parallelogram is 117 cm^2. Find its base $\overline{AB}$.



.

A 17 cm B 9 cm C 14 cm
D 13 cm E 15 cm.

This question tested the candidates' ability to identify and find the base of a parallelogram. The analysis shows that 548,691 (54.23%) chose the correct option D "sm 13". This indicates the performance of candidates in this question was average. The total number and percentage of the candidates with their responses are shown in Table 19.

Table 19: Number and Percentage of Candidates in Each Option

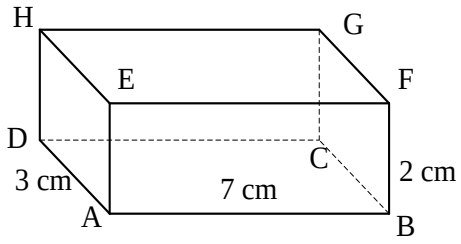
Option	A	B	C	D*	E	Others
Number of Candidates	103,418	164,685	124,366	548,691	57,713	12,837
Percentage of Candidates	10.22	16.28	12.29	54.23	5.70	1.27

The analysis of data shows that the candidates' performance in this question was average as 548,691 (54.23%) were able to find the base of a parallelogram and choose D "13cm" which is the correct answer. They did as follows;

Area of a parallelogram = Height x base,
$117=9\times AB \Rightarrow AB=117\div 9=13$
Base = 13 cm.

However, 450,182 (44.50%) candidates chose the distractor A, B, C or E. Such candidates lacked the knowledge of the relationship between the base and height of the parallelogram. Some of them failed to know the requirement of the question because they wrote some measurements of the parallelogram and concluded them as the required base. For example; the candidates who chose distractor A "17cm", C "14cm" and E "15cm" made some mistakes during division of the area given to the height of the parallelogram. Those who chose distractor B "9cm" took the base of the parallelogram as the answer required. Moreover, 2,396 (0.24%) candidates failed to comply with the given instructions by providing more than one option while 10,441 (1.03%) candidates omitted this question.

Question 30: Find the surface area of the following closed rectangular prism.



A $82\,cm^2$ B $61cm^2$ C $72cm^2$
D $42cm^2$ E $51cm^2$.

This question tested the candidates' ability to find the surface area of a closed rectangular prism. The analysis shows that 351,545 (34.75%) chose the correct option A "82 cm^2". This indicates that the performance of candidates in this question was weak. The total

number and percentage of candidates together with their options are summarized in Table 20.

Table 20: Number and Percentage of Candidates for Each Option

Option	A*	B	C	D	E	Others
Number of Candidates	351,545	79,738	132,686	386,397	46,831	14,513
Percentage of Candidates	34.75	7.88	13.12	38.19	4.63	1.43

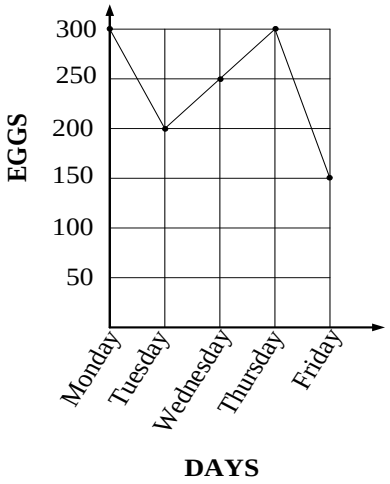
The analysis of the candidates' responses shows that 645,652 (63.82%) candidates chose the incorrect options B, C, D or E. This indicates that the performance was weak. The candidates failed to remember the correct formula. The candidates who chose distractor B "61cm^2" and C "72cm^2" and E "51cm^2" failed to add correctly the sides of the rectangular prism. Those who chose distractor D "42cm^2" found the volume of the prism instead of surface area.

However, 351,545 candidates, equivalent to 34.75 percent, who chose the correct answer A "82cm^2" applied the correct formula as follows;

$$\begin{aligned}\text{Area} &= 2\times(\text{ADHE}+\text{EFGH}+\text{ABFE})\\ &= 2\times[(3\text{cm}\times 2\text{cm})+(7\text{cm}\times 3\text{cm})+(7\text{cm}\times 2\text{cm})]\\ &= 2\times[6\text{cm}^2+21\text{cm}^2+14\text{cm}^2]\\ &= 2\times[41\text{cm}^2]\\ &\therefore \text{Area} = 82\text{cm}^2.\end{aligned}$$

Similarly, 3,403 (0.34%) candidates chose more than one answer while 11,110 (1.10%) candidates did not answer the question.

Question 31: The following line graph shows the number of eggs collected in a week from Monday to Friday. Find the average of the eggs collected.



A 250 B 200 C 300
D 220 E 240.

This question tested the candidates' ability to find the average of items using the line graph. The analysis shows that 389,892 (38.54%) chose the correct option E "240". This indicates the performance of candidates in this question was weak. The percentage of the candidates as well as their responses are summarized in Figure 12.

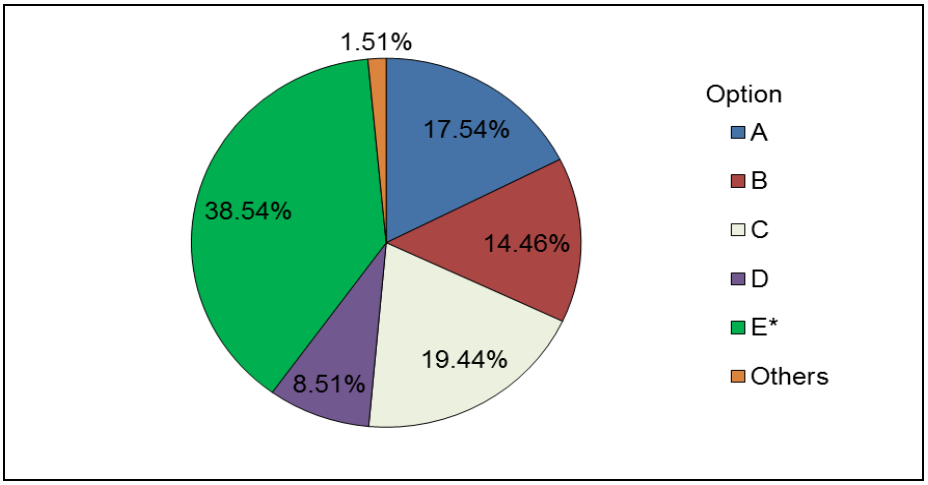


Figure 12: *Percentage of Candidates for Each Option*

The analysis of data shows that 606,526 candidates, equivalent to 59.95 percent, chose the incorrect options A, B, C or D. These candidates failed to calculate the average number of eggs using the line graph. For example, the candidates who chose distractor A "250"

concluded the collection of Wednesday to the average, those who chose B "200" took the collection of Tuesday as the average. The candidate who chose distractor C "300" were unable to read correctly the number of days from the line graphs. Similarly, the candidates who chose option D "220" were unable to divide and find the required average.

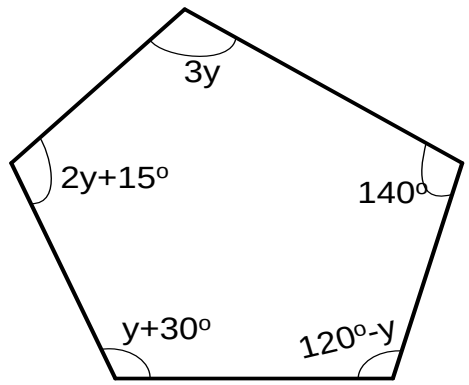
However, 389,892 (38.54%) candidates chose the correct answer E "240". These candidates were able to calculate the average of eggs using the line graph. They used the correct procedures of reading and calculating the average as follows;

$$\text{Average number of eggs} = \frac{\text{Total number of eggs}}{\text{Number of days}}$$

$$= \frac{300+200+250+300+150}{5} = \frac{1200}{5} = 240.$$

Likewise, there were 4,052 (0.40%) candidates who chose more than one answer while 11,240 (1.11%) candidates omitted the question.

Question 32: Find the value of *y* in the following figure:



A 11^{o} B 13^{o} C 47^{o}

D 45^{o} E 49^{o}.

This question tested the candidates' ability to find the value of y with regard to the total degree measure of the pentagon. The analysis shows that 436,873 (43.18%) chose the correct option C "47^{o}". This indicates the performance of candidates in this question was average.

The percentage of candidates with their responses are shown in Figure 13.

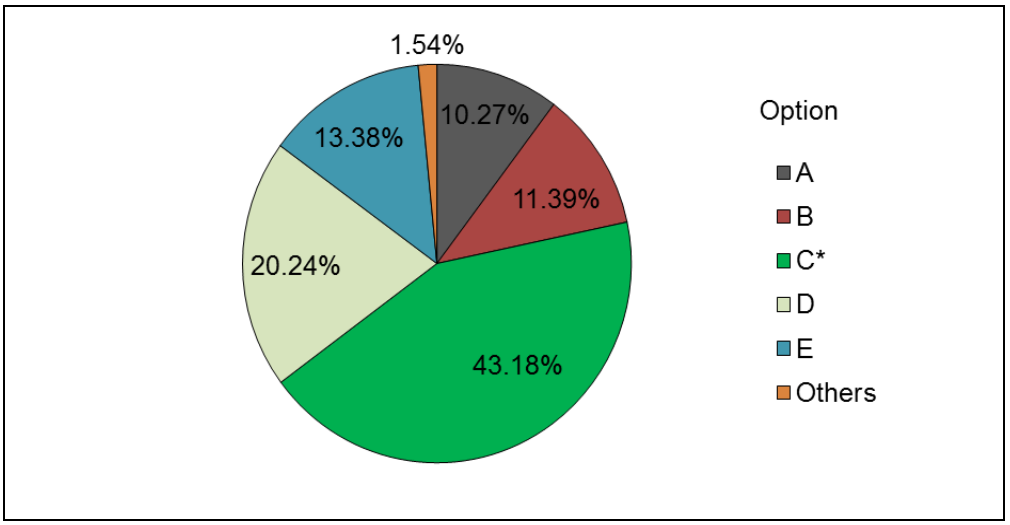


Figure 13: *Percentage of Candidates for Each Option*

The analysis of data shows the performance of candidates in this question was average because 436,873 (43.18%) candidates chose the correct answer C "47°". Such candidates were able to find the value of y that could make the correct total of degree measure in the pentagon which is 540^{o}. They were able to form the correct equation before solving for y as follows;

The sum of the interior angles in the Pentagon is 540°.

$\therefore 3y + 2y + 15° + y + 30° + 120° - y + 140° = 540°$

$5y + 305° = 540°$

$5y = 540° - 305°$

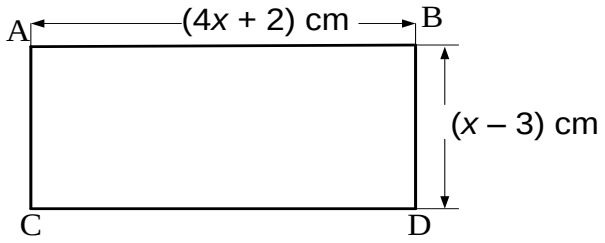
$5y = 235°$

$\therefore y = 47°.$

On the other hand, the analysis of data shows that 55.28 percent of the candidates chose the incorrect options A, B, D or E. These candidates lacked knowledge on the concepts of the total number of degree measures in the pentagon. For example, the candidates who chose distractor A "11°" had a wrong concept that the total of degree measure in a pentagon is 360^{o}. The candidates who chose distractor B "13°" failed to identify the equation connecting the angles in the

pentagon and 540°. Those who chose D "45°" and E "49°" were unable to perform mathematical operations correctly. Also, 3,634 (0.36%) candidates did not follow the given instructions by choosing more than one option while 11,943 (1.18%) candidates omitted the question.

Question 33: Find the area of the following rectangle if its perimeter is 198 cm:



A $20cm^2$ B $17cm^2$ C $82cm^2$

D $1,394cm^2$ E $1,384cm^2$.

This question tested the candidates' ability to find the area of the rectangle when the perimeter is given. The analysis shows that 335,776 (33.19%) chose the correct option D "1,394 cm^2". This indicates that the performance of candidates in this question was weak. The percentage of candidates together with their responses are shown in Figure 14.

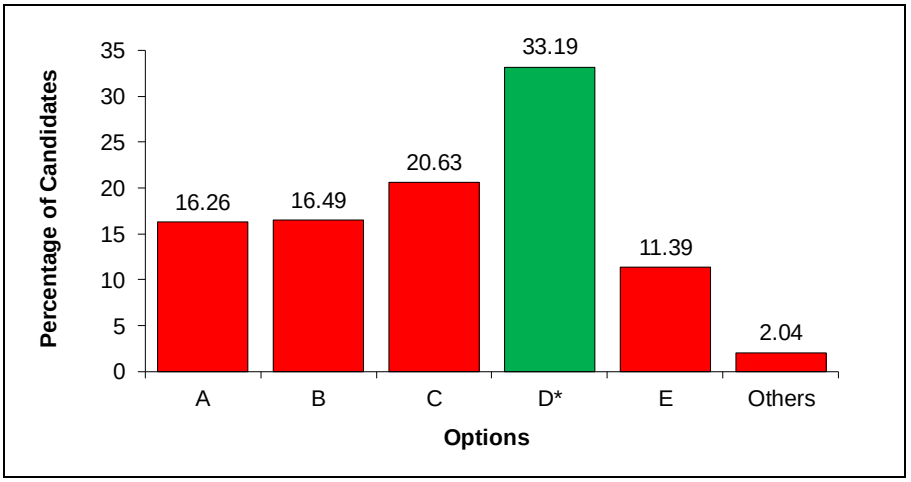


Figure 14: *Percentage of Candidates for Each Option*

The analysis of data shows that the candidates' performance in this question was weak because more than half of the candidates i.e.; 655,297 (64.77%) chose the incorrect answers A, B, C or E. Such candidates failed to find the length and width of a rectangle before calculating the area. Some of the candidates failed to use the value of *x* that was obtained to find the length and width of the rectangle before determining the required area. Hence, they chose distractor A, which is not a correct answer, those who chose B "$17cm^2$" failed to find the base of the rectangle. Those who chose C "$82cm^2$" found the length of the rectangle and those who chose distractor E "$1,384cm^2$" failed to multiply the length and height of the rectangle.

Despite the weak performance of the candidates in this question, there were 335,776 (33.19%) candidates who chose the correct answer D "$1,394cm^2$". These candidates were able to use the information given about the perimeter to find the value of *x* before substituting it to get the length and width then they calculated the area as follows;

$$\text{Perimeter} = 2\times(\text{width}+\text{length})$$
$$2\times[(x-3)\text{cm}+(4x+2)\text{cm}] = 198\text{cm}$$
$$2\times(5x-1\text{cm}) = 198\text{cm}$$
$$(10x-2)\text{cm} = 198\text{cm}$$
$$10x-2+2 = 198+2$$
$$10x = 200$$
$$x = 20$$
$$\therefore \text{Length} = 82\text{cm}, \quad \text{Width} = 17\text{cm}$$
$$\text{Area} = \text{Length}\times\text{Width}$$
$$= 82\text{cm}\times 17\text{cm}$$
$$\therefore \text{Area} = 1,394\text{cm}^2.$$

Furthermore, 2,889 (0.29%) failed to abide to the given instructions by choosing more than one option and 17,748 (1.75%) candidates did not answer this question.

Question 34: A pupil had sh 10,000 and bought the following items: 6 exercise books @ sh 270, 2 counter books @ sh 3000, 10 pens @ sh 150, 2 pencils @ sh 100. How much money did the pupil spend to buy those items?

A sh 8,320 B sh 9,320 C sh 1,680
D sh 1,780 E sh 680.

The question tested the candidates' ability to solve word problem concerning money. The analysis shows that 524,594 (51.85%) chose the correct option B "sh 9, 320". This indicates that the performance of candidates in this question was average. The percentage of the candidates and their responses are shown in Figure 15.

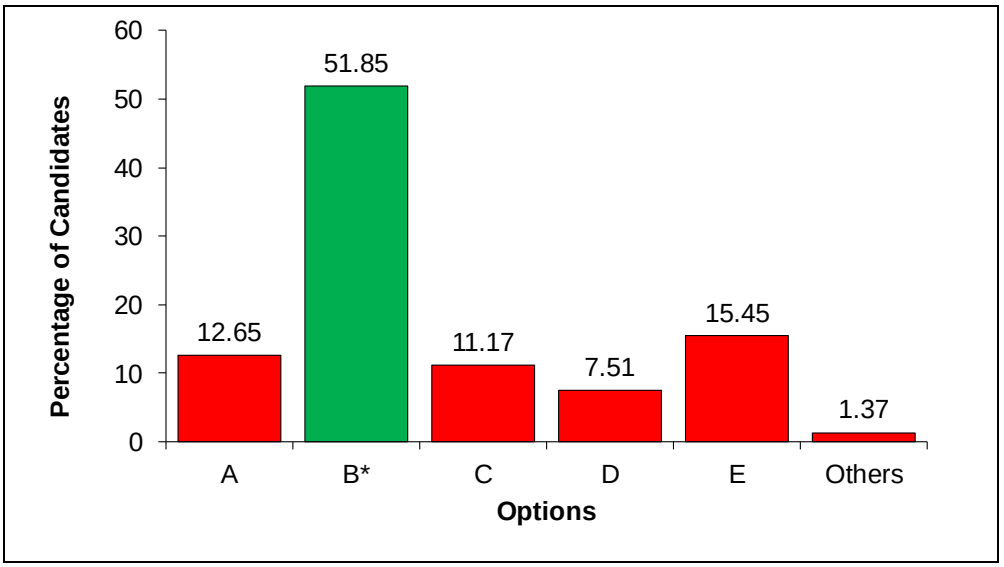


Figure 15: *Percentage of Candidates for Each Option*

The analysis of data shows that, a total of 524,594 (51.85%) candidates performed the question correctly. Such candidates were able to analyse and add the money using the account book, hence they chose the correct answer B "sh 9,320" as follows:

Item	Quantity	Price (sh)	Amount
Exercise book	6	270	1,620
Counter book	2	3,000	6,000
Pen	10	1,500	1,500
Pencil	2	100	200
Total			**9,320**

However, 473,303 (46.78%) candidates chose the incorrect answers A, C, D or E. These candidates failed to solve the word problem on analysis and addition of money. The candidates who chose distractor A "sh 8,320" failed to add correctly the given data about money, those who chose C "sh 1,680" and D "sh 1,780" failed to multiply 6 to 270 and 2 to 3,000 before adding the money and those who chose distractor E "sh 680" failed to understand the requirement of the question, because they found the remaining amount of money instead of the used money. Moreover, 3,442 (0.34%) failed follow the given instructions by choosing more than one option while 10,371 (1.03%) candidates did not answer this question.

Question 35: Kanagana has 17 cows for milk. If each cow produces 15 litres of milk every day, how many litres of milk does he get in every two weeks?

A 3,570 B 3,150 C 2,170
D 3,350 E 3,370.

This question tested the candidates' ability to solve a word problem involving the ratio of two numbers. The analysis shows that 433,301 (42.83%) chose the correct option A "3,570". This indicates the performance of candidates in this question was average. The percentage of candidates together with their options are shown in Figure 16.

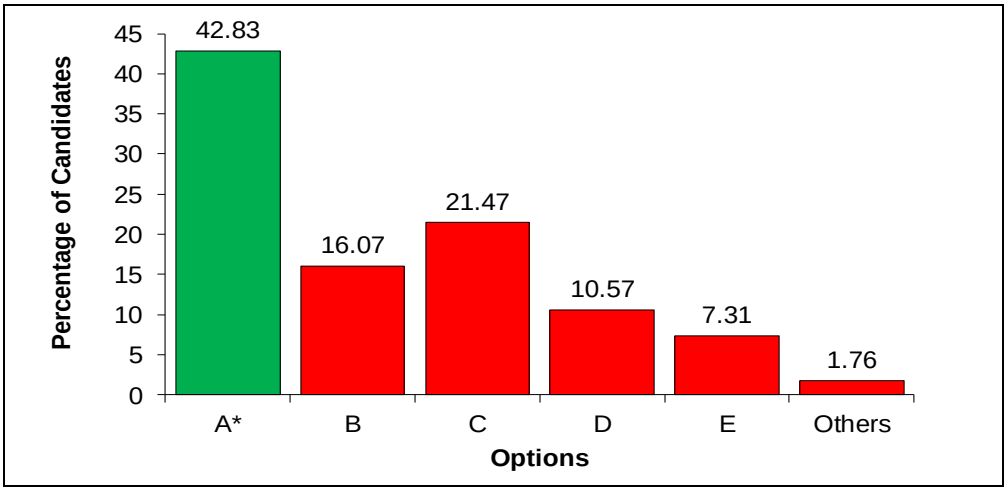


Figure 16: *Percentage of Candidates for Each Option*

The analysis shows that 433,301 (42.83%) candidates were able to answer the question correctly by choosing the correct answer A "3,570". The candidates calculated the number of litres in every two weeks as follows;

Amount of milk,

$$= \text{Number of cows} \times \text{Amount per cow} \times \text{Number of days}$$

$$= 17 \times 15 \times 7 \times 2 = 3{,}570$$

This shows that, the candidates had sufficient knowledge and skills on how to find the number of litres produced.

However, 560,578 (55.41%) candidates chose incorrect answer B, C, D or E. The analysis shows that candidates who chose the distractor B "3,150" and D "3,350" failed to multiply correctly the given numbers 17 and 15 and 14 days, the candidates who chose distractor C "2,170" failed to realise that two weeks is equivalent to 14 days and those who chose distractor E "3,370" were using the correct formula but they forget to carry the tens to the hundreds position during adding.

Question 36: Yusufu deposited some money in a bank that gives 5% interest rate per annum. If he deposited 100,000 shillings for a period of three years, how much interest did he get?

A 20,000/= B 15,000/= C 30,000/=
D 45,000/= E 10,000/=

The question tested candidates' ability to analyse and solve the problems about money. The analysis shows that 578,879 (57.22%) chose the correct option B "15,000/=". This indicates the performance of candidates in this question was average. Figure 17 shows the percentage of the candidates for each option.

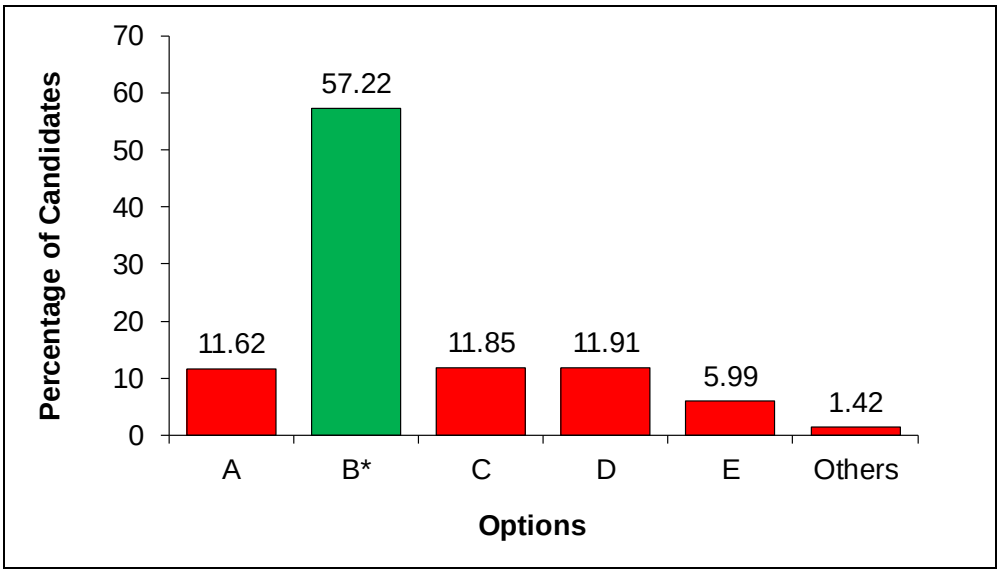


Figure 17: *Percentage of Candidates for Each Option*

The analysis of data shows that, the performance of candidates in this question was average because 578,879 (57.22%) answered the question correctly by choosing the correct answer B "15,000/=". These candidates used correctly the formula for calculating interest in the problems involving money as shown below;

$$\begin{aligned}\text{Interest} &= \frac{\text{Principal} \times \text{rate} \times \text{time}}{100} \\ &= \frac{100{,}000 \times 5 \times 3}{100} \\ &= \text{sh}\,15{,}000.\end{aligned}$$

However, 418,459 (41.36%) candidates chose other options A, C, D or E. These candidates failed to realize the required formula for calculating interest in money problems. Some of them used wrong formulae. They divided the initial amount by interest. The candidates who chose distractor C "30,000/=" multiplied the interest by 2, those who chose D "45,000/=" multiplied the interest by 3 and those who chose E "10,000/=" considered a half of initial amount divide by interest which is incorrect. Also, 3,124 (0.31%) candidates ignored the given instructions by choosing more than one option and 11,248 (1.11%) candidates did not attempt this question.

Question 37: My mother gave $\frac{1}{4}$ of a pineapple to my brother, $\frac{1}{4}$ to my friend and $\frac{1}{4}$ to my sister. What percentage of the pineaple remained?

A 30% B 20% C 75%
D 50% E 25%.

The question tested the candidates' ability to solve a word problem involving fractions and percentages of real things. The analysis shows that 400,114 (39.55%) chose the correct option E “25%”. This indicates the performance of candidates in this question was average. Figure 18 shows the percentage of candidates for each alternative.

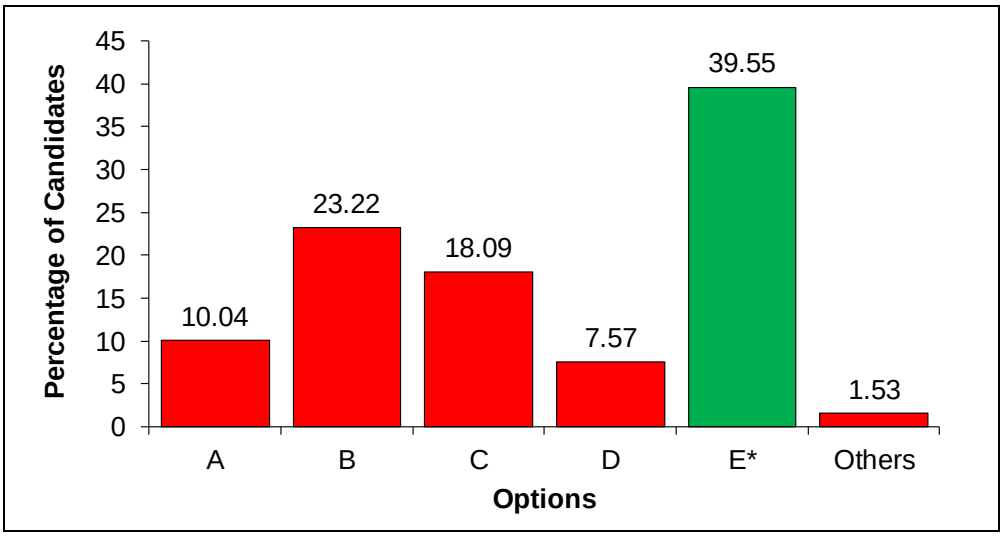


Figure 18: *Percentage of Candidates for Each Option*

The analysis shows that, there were 694,327 (74.39%) candidates who chose a correct answer E “25%”. These candidates were able to recognise that the question required the remaining piece and used the required fraction to change it into percentage then chose the correct answer as follows:

$$\text{The divided piece} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

$$= \frac{3}{4}$$

$$\text{Remained piece} = 1 - \frac{3}{4}$$

$$= \frac{1}{4}$$

Change into percentage;

$$= \frac{1}{4} \times 100\%$$

$$= 25\%.$$

The analysis of data shows that the performance of candidates in this question was weak because, 596,144 (58.92%) candidates chose the incorrect options A, B, C or D. Some of them calculated the percentage of the used fraction of pineapple instead of the remaining part of pineapple as it was asked. This means that they failed to understand the demand of the question. Those candidates who chose A "30%" failed to identify the used fraction in the word problem. Those who chose B "20%" failed to change fraction into percentage. Others who chose C "75%" considered the percentages that were used and those who chose distractor D "50%" calculated half of the distributed share which is 50% instead of 25%. On the other hand, 4,232 (0.42%) candidates chose more than one option while 11,220 (1.11%) omitted this question.

Question 38: In the books' shelf, $\frac{1}{4}$ are books for Mathematics and $\frac{1}{3}$ for Science. What fraction of books in the shelf is for Mathematics and Science together?

A $\frac{1}{12}$ B $\frac{3}{4}$ C $\frac{7}{12}$ D $\frac{2}{7}$ E $\frac{4}{3}$.

The question tested the candidates' competence in solving word problems involving fractions. The analysis shows that 449,803

(44.46%) chose the correct option C "$\frac{7}{12}$". This indicates the performance of candidates in this question was average. Figure 19 shows percentage of the candidates for each alternative.

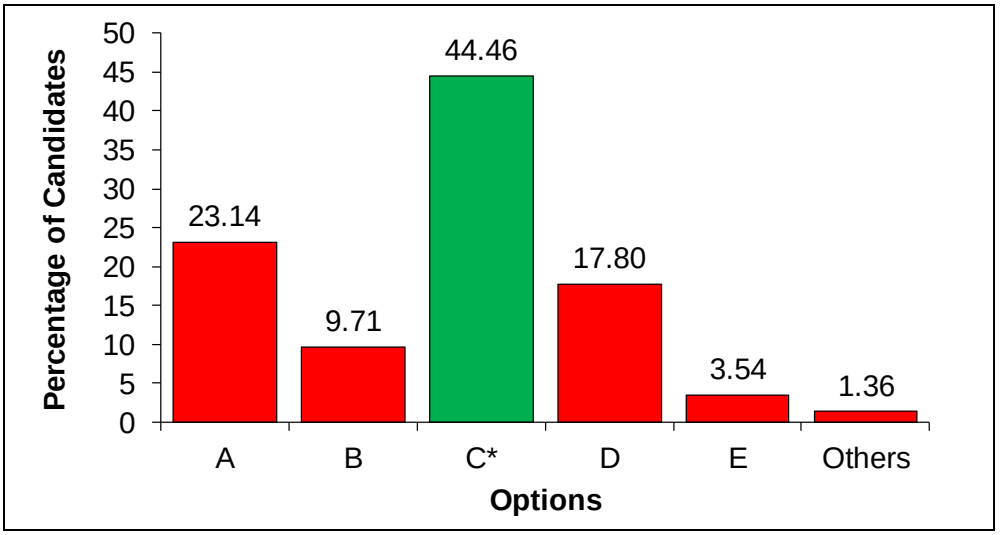


Figure 19: *Percentage of Candidates for Each Option*

The analysis of data shows that 449,803 (44.46%) candidates answered the question correctly. This implies that the performance of candidates in this question was average. The competent candidates were able to calculate the total of $\frac{1}{4}$ and $\frac{1}{3}$ correctly to get $\frac{7}{12}$.

However, there were 548,183 (54.13%) candidates who chose the incorrect answer A, B, D or E. The candidates who chose distractor A "$\frac{1}{12}$" multiplied two fractions $\frac{1}{4}$ and $\frac{1}{3}$ from the numerators and denominators separately while others subtracted $\frac{1}{4}$ from $\frac{1}{3}$ to get $\frac{1}{12}$ which is a wrong answer. Those who chose distractor B "$\frac{3}{4}$" divided $\frac{1}{4}$ by $\frac{1}{3}$. Those who chose distractor D "$\frac{2}{7}$" added the numerators and the denominators separately to get $\frac{2}{7}$ and the candidates who

chose E "$\frac{4}{3}$" failed to understand the fractions to be divided. This means that most of the candidates lacked knowledge of adding simple fractions.

Additionally, 3,298 (0.33%) candidates chose more than one option and 10,426 (1.03%) omitted this question.

Question 39: If 6 pipes of water fill a water tank for 40 minutes. How much time will it take for 10 similar pipelines to fill the same tank?

A 24 minutes B 24 hours C 1.5 hours
D 66.6 minutes E 2,400 seconds.

The question tested candidates' competence on the concept of ratios for word problem. The analysis shows that 371,848 (36.75%) chose the correct option A "24 Minutes". This indicates the performance of candidates in this question was weak. The following figure shows the percentage of the candidates for each option.

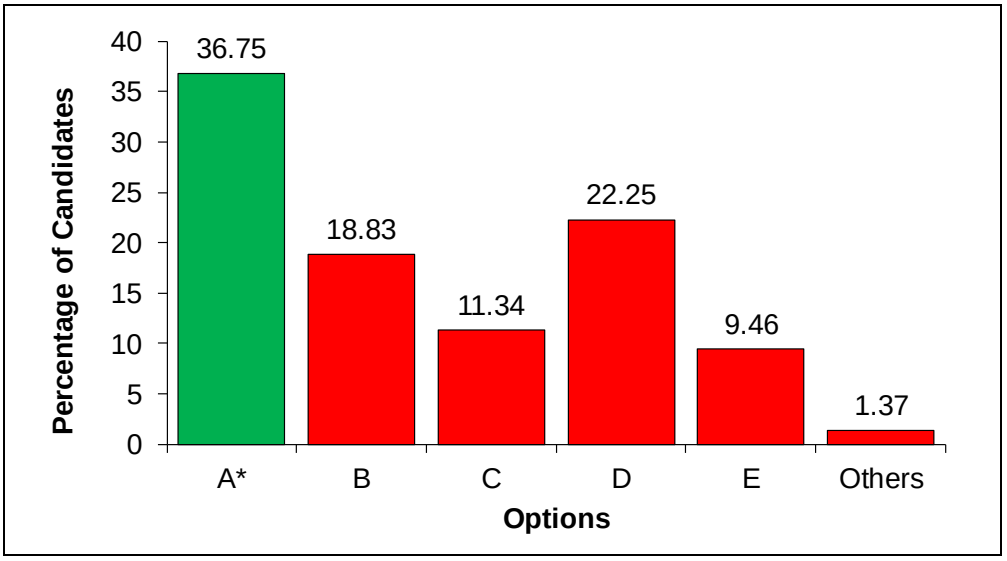


Figure 20: *Percentage of Candidates for Each Option*

The analysis of data shows that 625,974 (61.87%) candidates chose incorrect answers B, C, D or E. The candidates in this category were not able to formulate the equation that represents correctly the ratio in word problems. So generally, the performance of candidates in this

question was weak. The candidates who chose distractor B "24 hours" failed to differentiate between minutes and hours. Those who chose C "1.5 hours" multiplied 10 pipes and 6 pipes and divided by 40 minutes. Those who chose the distractor D "66.6 minutes" made the ratio between the pipe and tank and those who chose E "2,400 seconds" multiplied 6 tanks to 40 and 10 pipes.

However, the analysis of the candidates' responses shows that there were 371,848 (36.75%) competent candidates who managed to formulate correctly the equation that relates the ratio expression in word problems and formulate the correct equation then choose the correct answer A "24 minutes" as follows;

Pipe		Tank		Time
6	$\rightarrow$	1	$\rightarrow$	40
10	$\rightarrow$	1	$\rightarrow$	x

$\therefore 6 \times 1 \times 40 = 10 \times 1 \times x$

$10x = 240$

$\therefore x = 24$

Time = 24 minutes.

Also 2,842 (0.28%) candidates chose more than one options and 11,046 (1.09%) omitted this question.

Question 40: John bought an egg for 500 shillings and sold it for 800 shillings. What percentage of profit did he get?

A 60% B 37% C $37\frac{1}{2}\%$ D $62\frac{1}{2}\%$ E 45%.

The question tested ability of candidates to solve the percentage task in the word problem. The analysis shows that 427,433 (42.25%) chose the correct option A "60%". This indicates the performance of candidates in this question was average as shown in Figure 21.

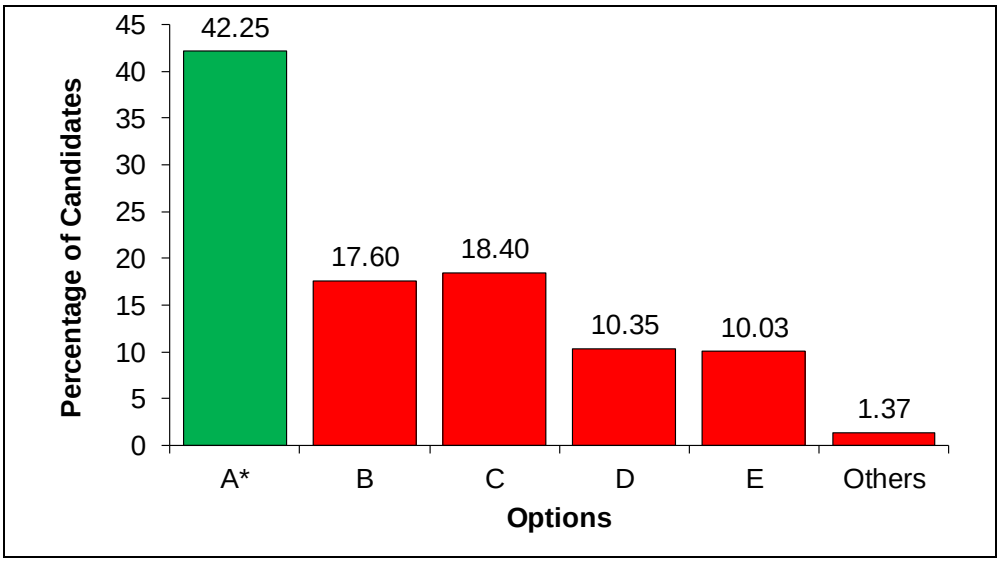


Figure 21: *Percentage of Candidates for Each Option*

A total of 427,433 (42.25%) candidates managed to analyse the problem clearly and got a correct answer A "60%". These candidates relate the buying and selling price in order to find the percentage of the profit obtained as follows;

$$\text{Percentage interest} = \frac{\text{Selling price} - \text{Buying price}}{\text{Buying price}} \times 100\%$$

$$= \frac{\text{sh}\,800 - \text{sh}\,500}{\text{sh}\,500} \times 100\%$$

$$= \frac{300}{500} \times 100\%$$

$$\therefore \text{Interest} = 60\%.$$

However, 570,412 (56.38%) candidates chose the incorrect answers B, C D or E. Some of these candidates used wrong formulae for calculating the percentage of the profit. The candidates who chose distractor B "37%" failed to multiply and divide the given data, those who chose C "$37\frac{1}{2}$%" used 800 as the denominator instead of 500, those who chose D "$62\frac{1}{2}$%" and E "45%" failed to subtract in order to get the interest at the final step of the calculation. Moreover, 2,157

(0.21%) candidates chose more than one options and 11,708 (1.16%) candidates did not answer this question.

2. 2 Section B: Short Answer Items

Question 41: Aneth's weight is 50 kg 260 g and Asha's weight is 20 kg 350g less than that of Aneth. Find the weight of Asha.

The question tested the candidates' competence to identify the weight units of things. The analysis of data shows that 283,495 candidates, equivalent to 28.11 percent, scored marks 1 or 2. Therefore, the candidates' performance in this question was weak. Figure 22 shows the candidates' performance in this question.

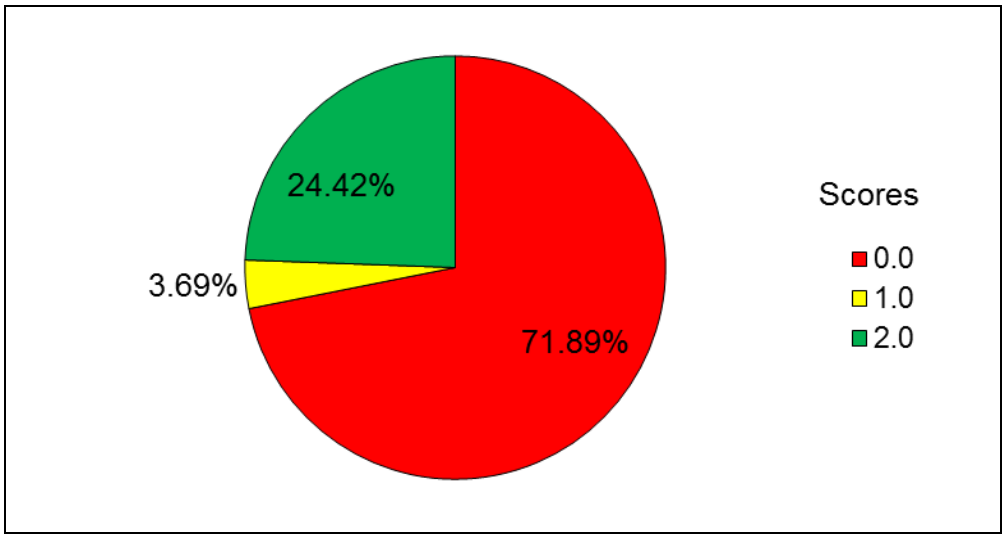


Figure 22: *Candidates performance in this question*

On the other hand, 724,983 (71.89%) candidates scored 0 marks. The candidates' solutions revealed that they failed to recognise the requirements of the question. Some of them added the weight of Aneth to that of Asha instead of subtracting, see Extract 41.1.

No.	Question	Working Place	Answer
41.	Aneth's weight is 50 kg 260 g and Asha's weight is 20 kg 350 g less than that of Aneth. Find the weight of Asha.	KG G 50 260 +20 850 70 610	=70KG 610grams

Extract 41.1: *An incorrect response from one of the candidates*

Extract 41.1 shows the response of a candidate who made wrong calculations in this question and got a wrong answer.

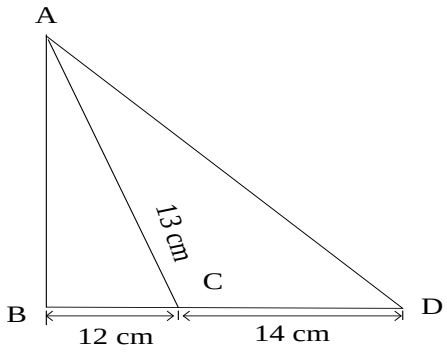
However, 246314 (24.42%) candidates answered this question correctly by scoring 2 marks. Extract 41.2 shows, one of the candidates who realized that the task of the question was to subtract the given weights of Aneth and Asha.

41.	Aneth's weight is 50 kg 260 g and Asha's weight is 20 kg 350 g less than that of Aneth. Find the weight of Asha.	KG G 45 1260 -20 350 29 910	29KG 910G

Extract 41.2: A correct response from one of the candidates

Extract 41.2 shows the response of a candidate who made correct calculation and got the correct answer.

Question 42: Find the area of triangle ACD.



The question tested the ability of the candidates to calculate the area of a triangle resulting from a plain Figure. The analysis of data shows that only 90,291 (8.96%) candidates scored 1 or 2 marks. Therefore,

the candidates' performance was weak. Figure 23 shows the candidates' percentage and their scores.

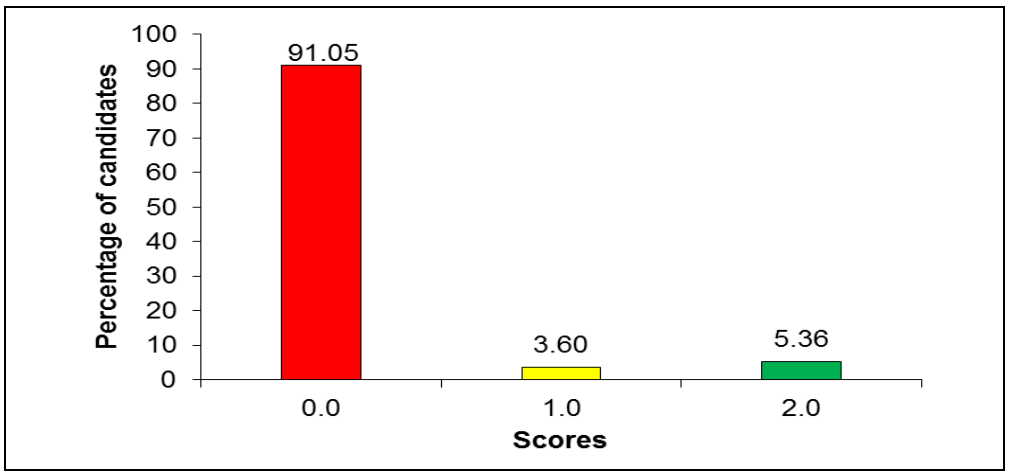
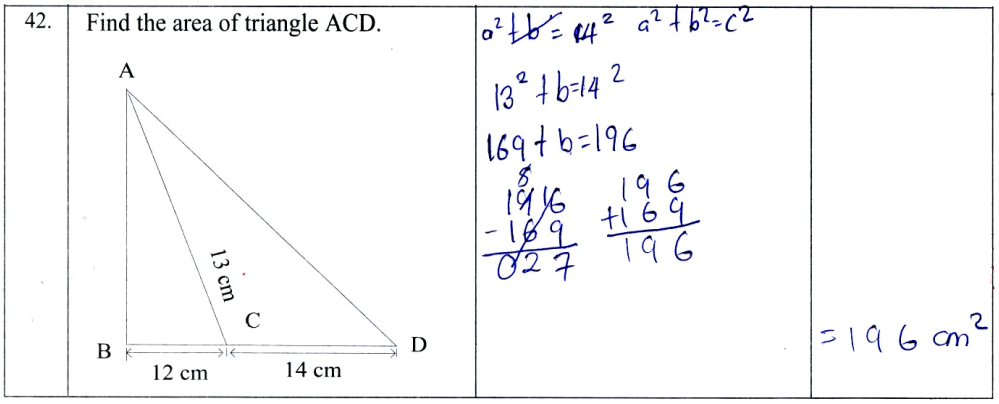


Figure 23: *Candidates' Performance in Question 42*

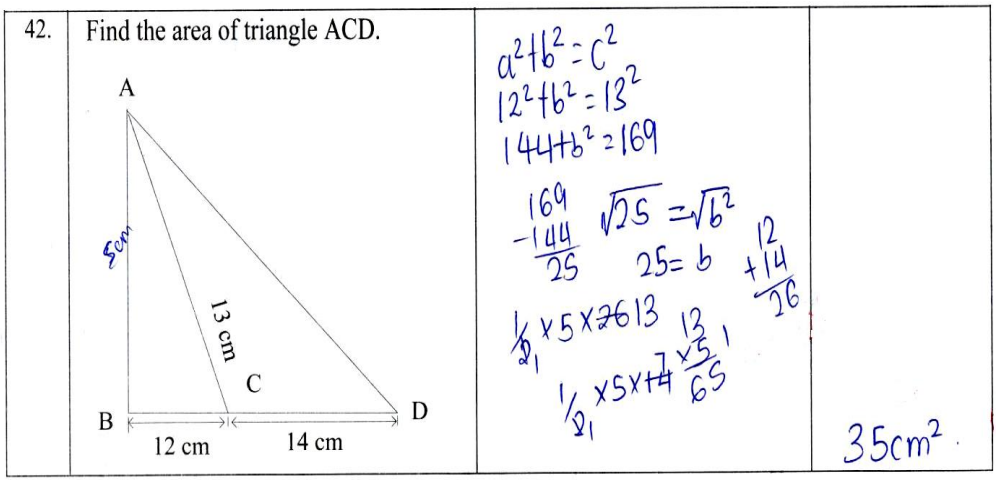
A total of 918,187 candidates, equivalent to 91.05 percent scored 0 marks. In this case some of the candidates failed to understand the requirements of the question because they were using Pythagoras rule to find the area instead of establishing the length of $\overrightarrow{AB}$ before calculating for the area by using the formula; $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$ as shown in Extract 42.1.



Extract 42.1: An incorrect response from one of the candidates

Extract 42.1 presents the answer of one of the candidates who made wrong calculations and ended up with incorrect answer in question 42.

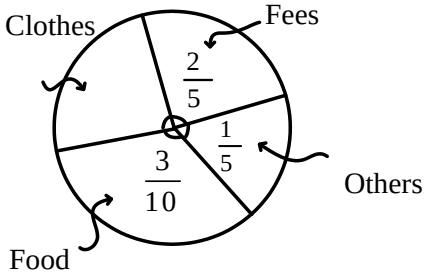
On the other hand, the competent candidates were able to apply the correct formula which is; $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$ after determining first the value of the length $\overrightarrow{AB}$ as illustrated in Extract 42.2.



Extract 42.2: A correct response from one of the candidates

Extract 42.2 shows the answer of a candidate who managed to calculate correctly and get the required answer in question 42.

Question 43: Mamapesa spent her monthly salary as shown in the following pie chart:



If her salary was sh 64,000 per month, how much money was used for buying clothes?

This question tested the candidates' ability to solve for the statistical problem presented in pie chart. Figure 24 depicts the candidates' performance in this question.

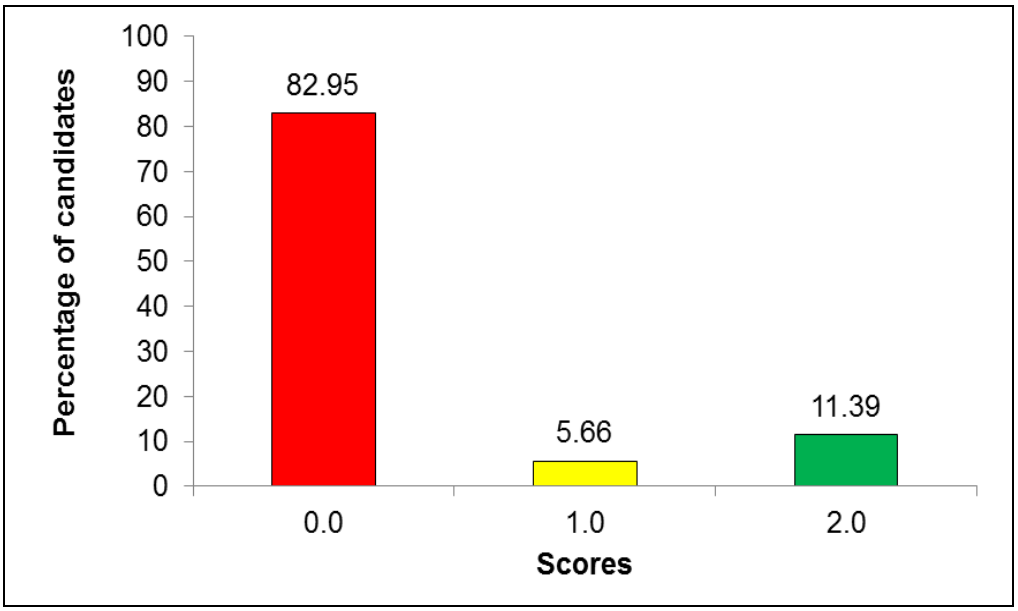
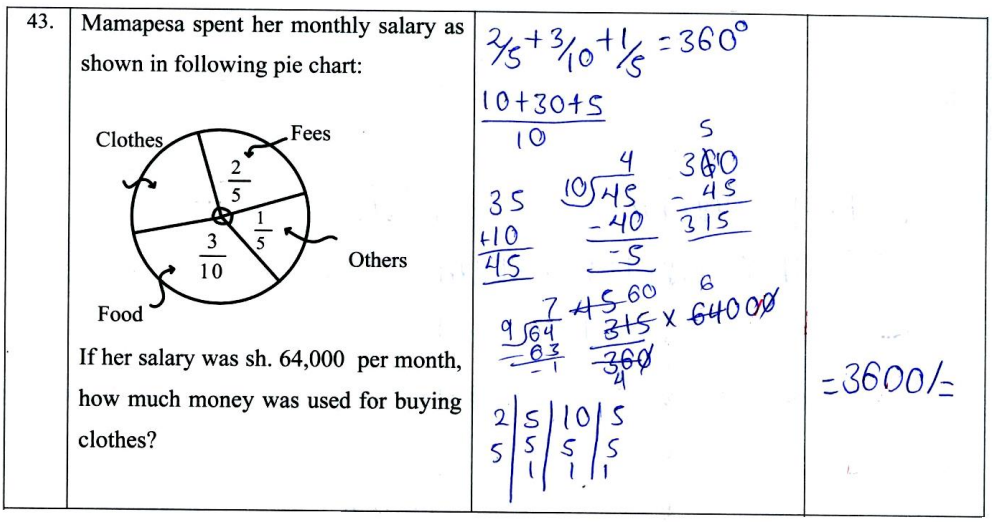


Figure 24: *Candidates' Performance in Question 43*

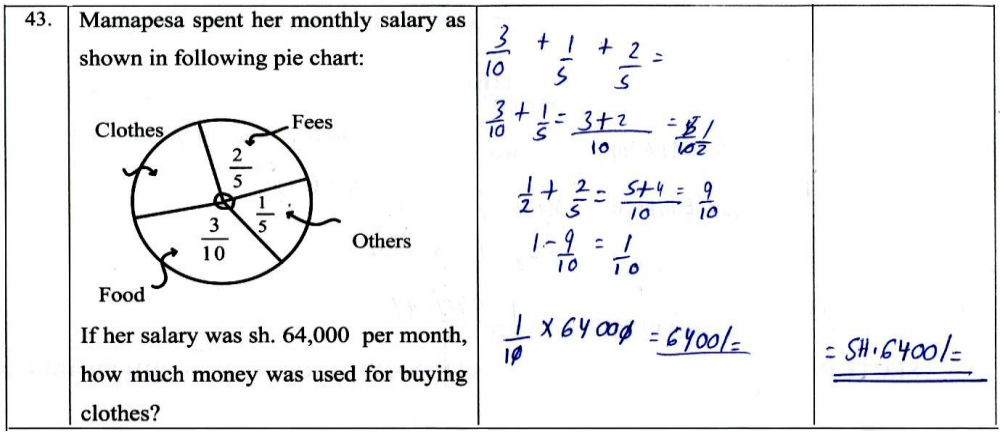
The analysis of data shows that 836,547 (82.95%) candidates scored 0 which indicates poor performance. These candidates did not understand that the sum of the degree measure in the pie chart is equal to 360^{O} after adding all items. The correct procedures to achieve this was $x+\frac{2}{5}+\frac{1}{5}+\frac{3}{10}=360^{\circ}$ where x represnts the value spent for clothes. Some of the candidates in this category ignored to find for x as in Extract 43.1.



Extract 43.1: An incorrect work from one of the candidates

Extract 43.1 shows the wrong answer of one of the candidates due to wrong procedures applied in calculating question 43.

Further analysis of data shows that 114823 (11.39%) scored all 2 marks. These candidates managed to find the value representing the fraction spent for clothers before determining the amount of money that was used with reference to the monthly salary as shown in Extract 43.2.



Extract 43.2: A correct response from one of the candidates

Extract 43.2 shows the answer of a candidate who had adequate knowledge on how to calculate the money used for buying clothes.

Question 44: Bernadeta divided six thousands and four hundred shillings among her three children; Suzana, Janeth and Kamata in the ratio of 4: 3: 1 respectively. Find the amount of money which Janeth got.

This question assessed the candidates' competence in performing division by using ratio. The candidates' performance in this question is shown in Figure 25.

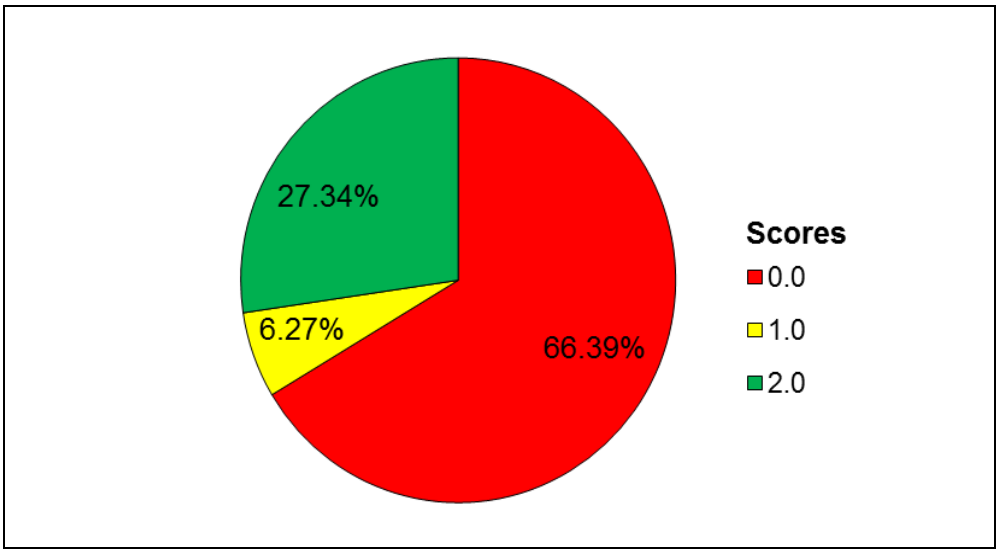
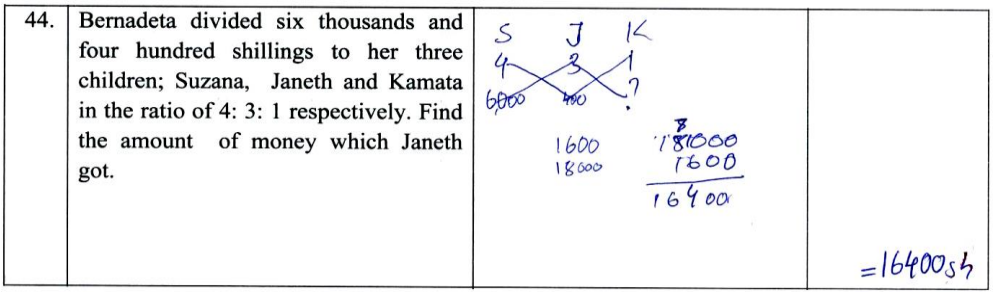


Figure 25: *Candidates' Performance in Question 44*

The analysis of data shows that the candidates' performance in this question was weak. This is because, 669,462 (66.38%) candidates had insufficient understanding on application of ratios to calculate the money Janeth got. Some of the candidates made computational errors by multiplying the given ratios wrongly. They were looking for the unknown value in the given ratio that was not required as shown in Extract 44.1.



Extract 44.1: An incorrect answer from one of the candidates

Extract 44.1 shows the wrong response of a candidate who applied wrong formula in question 44.

On the other hand, 339,016 (33.61%) candidates scored marks 1 or 2. The candidates managed to use the knowledge of ratios to find the amount of money which Janeth got. The candidates who scored 2 marks were able to calculate the ratio Janeth got as shown in Exract

44.2 which is a sample response from a candidate who answered this question correctly.

44.	Bernadeta divided six thousands and four hundred shillings to her three children; Suzana, Janeth and Kamata in the ratio of 4: 3: 1 respectively. Find the amount of money which Janeth got.	6400 $\frac{3}{8} \times 6\overset{800}{\cancel{400}} = 2400/=$	=SH. 2400/=

Extract 44.2: *A correct response from one of the candidates*

Extract 44.2 shows the correct answer from a candidate who used the correct formula in his/her calculations for question 44.

Question 45: James rode his bicycle at a distance of 112 km at the speed of 8 km/hr. How many minutes did he take to complete his journey?

This question tested the candidates' ability to solve word problems about distance and speed. The candidates' performance in this question as shown in Figure 26.

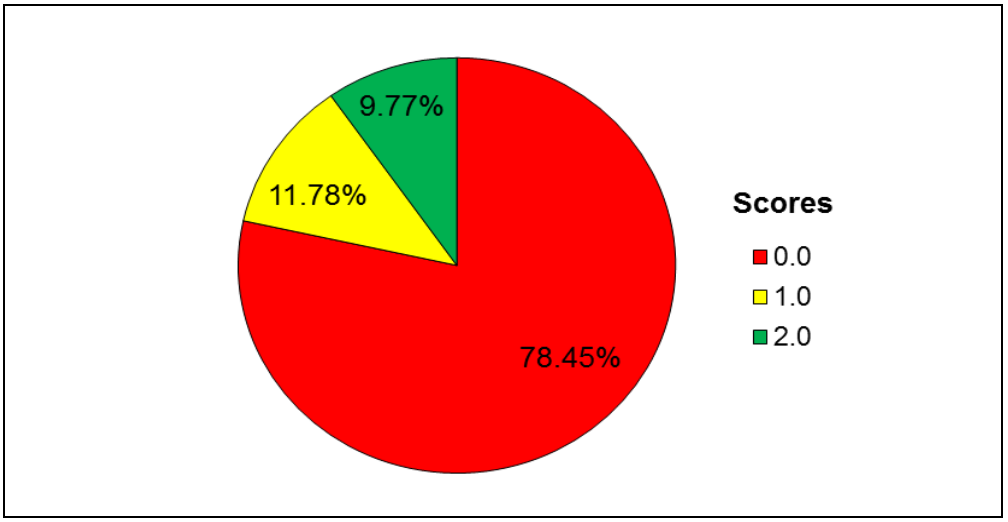
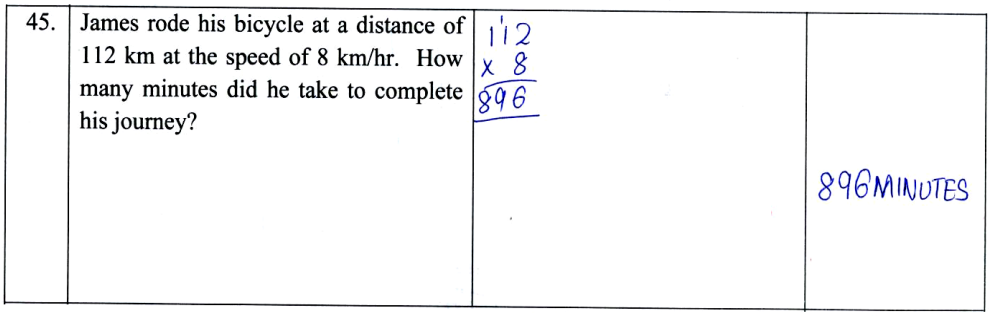


Figure 26: *Candidates' Performance in Question 45*

Figure 26 shows that 791,155 (78.45%) candidates scored 0 which indicates weak performance. Some of the candidates failed to get the correct answer because they added 112 to 8 to get 896 minutes instead of dividing. Others added 112 and 8 to get 120 minutes.

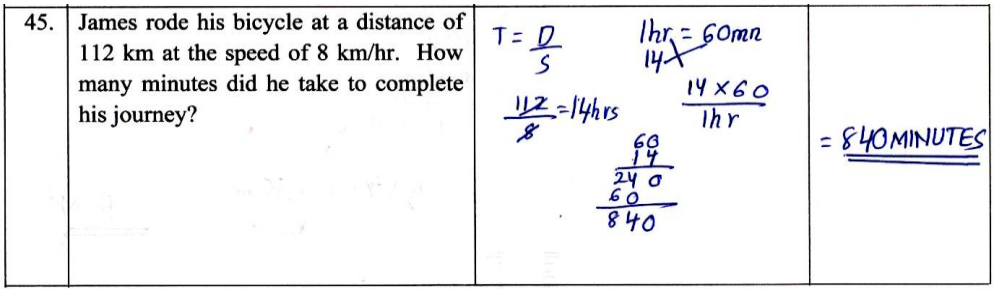
Extract 45.1 displays an incorrect response from one of the candidates.



Extract 45.1 *An incorrect answer from one of the candidates*

Extract 45.1 presents the response from one of the candidates who used wrong data for calculating the answer in question 45.

However, few candidates 98,563 (9.77%) got the correct answer by dividing 112 by 8 to get 14 hours which is equal to 840 minutes. Extract 45.2 shows a sample of a candidate who answered this question correctly.



Extract 45.2: A correct answer from one of the candidate

Extract 45.2 shows the correct answer for question 45 from a candidate who used correct procedures to obtain the required response.

3.0 A SUMMARY OF THE ANALYSIS OF CANDIDATES' RESPONSES

The analysis of the candidates' responses in the 2020 Mathematics examination shows that, out of 40 questions from Section A, 15 questions were well performed. These questions were set from the topics of *Decimals, Whole Numbers, Algebra, Roman Numbers* and *Fractions*. Further analysis shows that 15 questions from the topic of *Fractions, Currency, Algebra, Measurements*, *Percentage* and

Geometry were averagely performed. On the other hand, 10 questions from the topics of *Whole Number, Algebra, Measurements* and *Geometry* had weak performance.

In Section B, 5 questions from the topics of *Algebra, Geometry* and *Measurements* had weak performance. The analysis of the candidates' performance topic-wise is shown in Appendices I and II.

The weak performance in both Sections A and B was contributed by failure of candidates to apply the appropriate techniques for formulating equations from word problems and geometrical figures. They also failed to apply appropriate formulae for finding the volume of a cylinder, to find the area of; triangles, rectangles, prism, parallelogram and cylinder. Similarly they failed to find the perimeters of Isosceles triangles and the surface area of a rectangular prism, failure to find the volume of a cylinder and inability to change various units.

4.0 CONCLUSION

Generally, the performance in the Mathematics examination for 2020 has increased compared to that of 2019. The analysis shows that, in 2020 out of 11 topics that were examined there are 04 topics that had a good performance; these topics are *Decimals, Whole Numbers, Roman Numbers and Fractions.* Also, out of 13 topics which were examined in 2019, 05 topics which are *Whole Numbers*, *Roman Numbers, Coordinate Geometry, Decimals* and *Fractions* were well performed. Thus, the topics of *Whole Numbers*, *Decimals*, *Roman Numbers* and *Fractions* were well performed in both 2019 and 2020 examinations.

Further analysis shows that out of 11, 4 topics were well performed. These topics are *Decimals, Whole Numbers, Roman Numbers* and *Fractions.* Further analysis shows that 4 topics had average performance. These topics are *Algebra*, *Measurements*, *Currency* and *Percentages*. Furthermore, 3 topics of *Geometry*, *Statistics* and *Number patterns* had a weak performance.

It was revealed that, the reasons for the poor performance includes; the candidates' failure to construct equations from word problems by

using the formulae for finding the area of triangles, circles, squares, faces of rectangular prisms, volume of cylinder as well as converting various measurements.

Moreover, in statistics the candidates failed to read and record the data from the charts or graphs which were provided. Similarly, they failed to recognise how to use the actual values represented by those coordinates so as to respond to the asked question.

On the other hand, on Number patterns, the candidates could not recognise the rule which was used to determine the next term.

5.0 RECOMMENDATIONS

In order to improve the candidates' performance for future in Mathematics examinations, the following are recommended:

(a) Teachers should put more emphasis on teaching the topics of *Geometry, Statistics* and *Number patterns* which were poorly performed.

(b) Teachers should exert more effort in order to improve the pupils' skills in performing basic mathematical operations, especially on *Whole Numbers*, *Integers*, *Fractions* and *Decimals*.

(c) Teachers should equip pupils with the ability to form various formulae. For instance, deriving the formula for calculating the perimeter of a rectangle and the surface area of a rectangular prism.

(d) Providing to pupils adequate exercises on ascending and descending number patterns involving fractions, mixed numbers and whole numbers in which the pupils performed poorly.

Appendix I

Percentages of Performance for Each Topic

S/N	Topic	2020			
		Performance for Each Question			
		Number of Question	Performance (%)	Average Performance (%)	Remarks
1	Decimals	3	87.62	84.13	Good
		4	90.80		
		6	73.97		
2	Whole numbers	7	91.61	71.86	Good
		8	91.55		
		9	76.74		
		11	36.68		
		12	74.44		
		13	68.61		
		19	63.37		
3	Roman numbers	17	65.21	65.21	Good
4	Fractions	1	57.25	62.52	Good
		2	65.48		
		5	82.90		
		38	44.46		
5	Money	34	51.85	54.54	Average
		36	57.22		
6	Algebra	10	60.45	51.57	Average
		15	46.21		
		16	76.21		
		18	57.00		
		22	35.94		
		44	33.62		
7	Measurements	20	78.90	41.63	Average
		35	42.83		
		39	36.75		

S/N	Topic	2020			
		Performance for Each Question			
		Number of Question	Performance (%)	Average Performance (%)	Remarks
		41	28.11		
		45	21.55		
8	Percentages	14	37.52	40.00	Average
		37	39.55		
		40	42.25		
9	Geometry	23	28.59	37.27	Weak
		24	44.42		
		25	40.57		
		26	47.01		
		27	41.94		
		28	49.94		
		29	54.23		
		30	38.19		
		32	43.18		
		33	33.19		
		42	8.95		
		43	17.05		
10	Statistics	31	38.54	38.54	Weak
11	Number patterns	21	36.17	36.17	Weak

Appendix II

Comparison of Candidates' Performance per Topic between PSLE 2019 and PSLE 2020

S/N	Topic	2019				2020			
		Performance for Each Question				Performance for Each Question			
		Number of Question	Performance (%)	Average Performance (%)	Remarks	Number of Question	Performance (%)	Average Performance (%)	Remarks
1	Whole numbers	1	88.07	75.01	Good	7	91.61	71.86	Good
		2	81.75			8	91.55		
		4	83.82			9	76.74		
		10	75.99			11	36.68		
		15	69.7			12	74.44		
		16	71.55			13	68.61		
		22	71.39						
		34	58.45			19	63.37		
		37	74.39						
2	Roman numbers	9	67	67.00	Good	17	65.21	65.21	Good
3	Demals	3	70.37	66.73	Good	3	87.62	84.13	Good
		11	77.87			4	90.8		
		12	66.6			6	73.97		
		20	52.09						
4	Fractions	5	68.98	61.93	Good	1	57.25	62.52	Good
		6	72.1			2	65.48		
		9	67.93			5	82.9		
		17	73			38	44.46		
		38	27.63						
5	Statistics	39	55.53	55.53	Average	31	38.54	38.54	Weak
6	Money	33	45.1	45.1	Average	34	51.85	54.54	Average
						36	57.22		

S/N	Topic	2019				2020			
		Performance for Each Question				Performance for Each Question			
		Number of Question	Performance (%)	Average Performance (%)	Remarks	Number of Question	Performance (%)	Average Performance (%)	Remarks
7	Percentages	13	56.8	42.47	Average	14	37.52	40.00	Average
		35	28.14			37	39.55		
						40	42.25		
8	Algebra	14	37.89	38.53	Weak	10	60.45	51.57	Average
		18	25.28			15	46.21		
						16	76.21		
		36	46.87			18	57.00		
		45	44.08			22	35.94		
						44	33.62		
9	Geometry	23	18.61	33.62	Weak	23	28.59	37.27	Weak
		24	64.46						
		25	41.33			24	44.42		
		26	22.97			25	40.57		
		27	27.24			26	47.01		
		28	34.12			27	41.94		
		30	31.99			28	49.94		
		31	44.25			29	54.23		
		32	14.18			30	38.19		
		40	33.9			32	43.18		
		43	36.74			33	33.19		
						42	8.95		
						43	17.05		
10	Measurements	41	20.29	30.28	Weak	20	78.9	41.63	Average
						35	42.83		
						39	36.75		
		42	21.2			41	28.11		
		44	49.36			45	21.55		