

5.0 MATHEMATICS

In the year 2007, 698,364 candidates sat for the KCPE Mathematics examination. These candidates registered a mean score of 24.62 with a standard deviation of 10.38 compared to a mean score of 26.97 with a standard deviation of 10.33 the previous year.

5.1 GENERAL PERFORMANCE

Table 6 below shows the general performance for the year 2007 KCPE Mathematics examination. For the purpose of comparison, data for the years 2004 to 2006 is also provided.

Table 6: General Performance in Mathematics over the Last Four Years

YEAR	2004	2005	2006	2007
National Raw Mean	23.32	23.45	26.97	24.62
Mode mark	15	15	18	15
Highest Marks	50	50	50	50
Standard Deviation	9.95	9.90	10.33	10.38

Table 7 below shows the general performance for the year 2007 KCPE Mathematics examination by gender.

Table 7: General Performance in Mathematics in the Year 2007 by Gender

GENDER	MALE	FEMALE
National Raw Mean	26.07	23.00
Modal Mark	16	15
Highest Mark	50	50
Standard Deviation	10.66	9.80

Table 8 below shows the number of questions set in each aspect of the syllabus and candidates' performance in the set areas.

Table 8: Performance in Mathematics KCPE Examination in the Year 2007 on each area of the syllabus

TYPE OF QUESTIONS	NO. OF QUESTIONS	% OF CANDIDATES SCORING CORRECTLY			
		2004	2005	2006	2007
Arithmetic:					
a) Mechanical	4	61.87	42.04	54.01	55.57
b) Applied	30	41.45	47.86	52.66	29.39
Data from Table	3	59.84	38.17	56.00	43.68
Geometry	8	39.18	38.05	45.96	46.19
Graphs	2	35.03	49.14	55.31	37.44
Algebra	3	31.90	45.72	42.64	34.77

From the above data, the following conclusions may be drawn:

- i) Majority of the questions tested on application of arithmetic skills. However, the year 2007 candidates performed dismally on this area of the syllabus.
- ii) A slight improvement in performance was registered in Mechanical and Geometry. This needs to be maintained.

5.2 ANALYSIS OF PERFORMANCE IN SELECTED ITEMS

The following is an analysis of performance of candidates who sat for the year 2007 KCPE Mathematics examination. These candidates recorded a mean score of 24.62 out of 50 with a standard deviation of 10.38.

Figure 5 below shows the percentage of candidates scoring correctly in each item in the year 2007 KCPE Mathematics examination. Any item with a percentage of 30% or below of candidates scoring correctly is considered to have been poorly performed hence difficult and will be included for more detailed analysis.

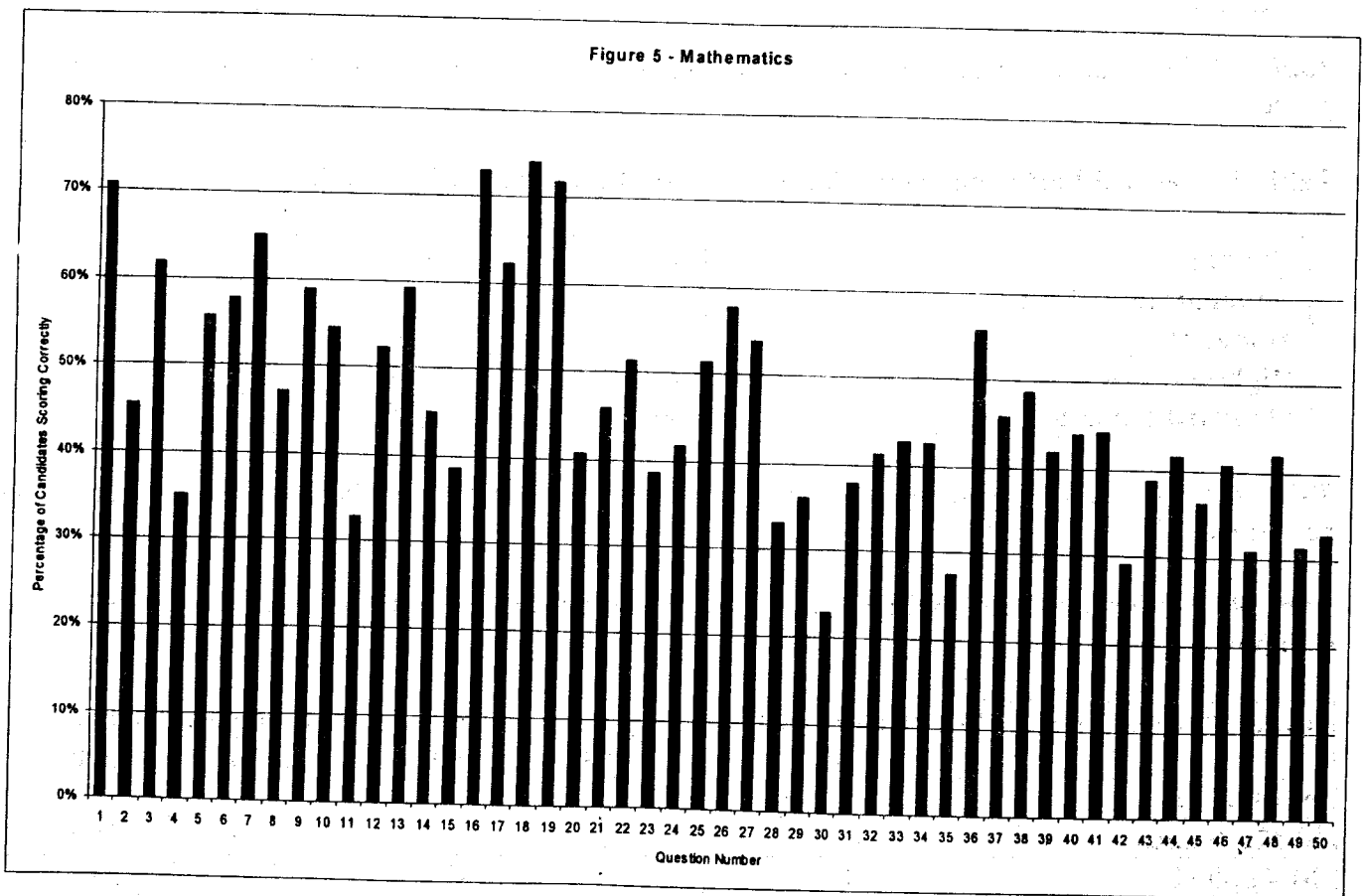


Table 9: Questions in which candidates Performed Poorly

QUESTION NUMBER	30	35	42	47
% of candidates scoring the item correctly	22.80	27.49	29.05	30.94

The discussion that follows will focus on analysis of the items above, based on the concepts and skills each item tested and the thinking processes the candidates possibly went through to arrive at the correct responses and the misconceptions that are likely to have made candidates get attracted to the wrong response. An asterisk (*) in a response pattern denotes the correct response.

Question 30

In a certain company candidates G, K and L contested for a seat. The number of those who voted for K was 800, which was 0.25 of the total votes. Out of the remaining votes, L received 0.03 more than G.

How many more votes than K did the winning candidate get?

- A 72
- B 364
- C 436
- D 448

Response Pattern

Option	A	B	C	D*
% Choosing Option	28.84	21.69	24.59	22.80
Mean mark in other question	22.27	21.88	24.01	26.09

This was a comprehension question in which candidates were expected to identify the decimal fraction votes for the winning candidate L. That is 0.39. This translates to 1248 more votes than K. Thus the winning candidate had 448 more votes than K. The correct option was therefore D (448). This option attracted 22.80% of the candidates which was chosen by the bright candidates as shown by a mean mark of 26.09 in other questions. Those candidates who did not choose this option were unable to obtain 0.39, the decimal fraction votes for the winning candidate.

Question 35

There were m men in a bus. The number of children in the bus was three times that of men but eleven more than that of women. The total number of women, men and children in the bus was 45. Which one of the equations below can be used to find the number of men that were in the bus?

- A $5m - 11 = 45$
- B $4m + 11 = 45$
- C $7m + 11 = 45$
- D $7m - 11 = 45$

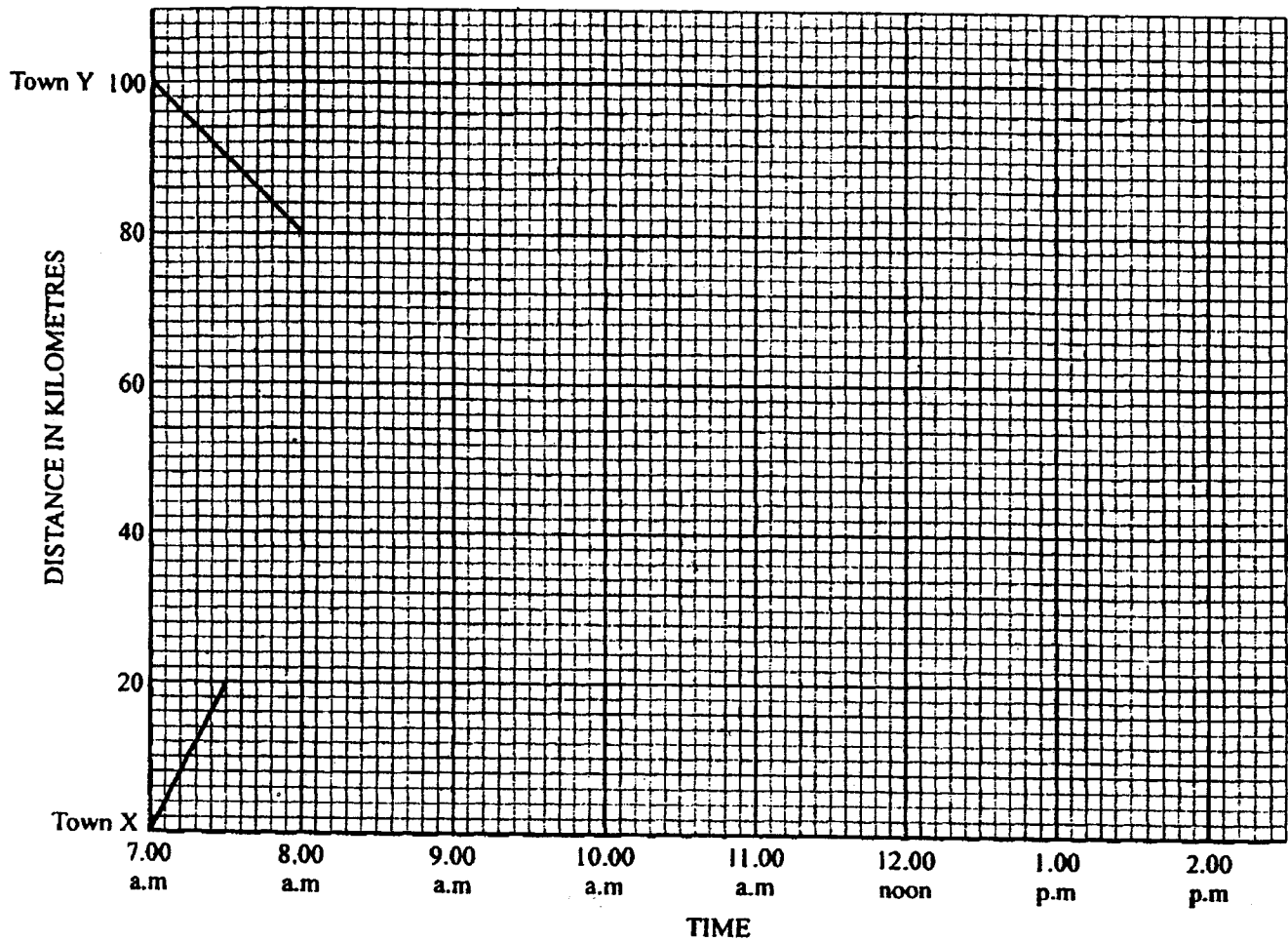
Response Pattern

Option	A	B	C	D*
% Choosing Option	14.19	33.08	23.59	27.49
Mean mark in other question	19.92	19.55	20.75	32.57

This question tested the candidates' knowledge on formation of an algebraic equation with one unknown from a word problem. 27.49% of the candidates chose the correct response D ($7m-11=45$). These were the bright candidates as shown by the mean mark of 32.57 in the other questions. Candidates were expected to realize that the number of children were $3m$ and hence the number of women were $3m-11$. Thus, the total number of people in the bus were $7m-11$ which is equal to 45. The candidates who chose Option B interpreted the number of women to be 11 only. Those who chose Option C misread the expression **more than** as **less than**. Those who chose Option A interpreted the number of children as m and that of men as $3m$.

Question 42

The graph below shows part of the journeys made by Chebet and Keya on the same road.



Chebet travelled from town Y to town X at a constant speed.

Keya travelled from town X to town Y. After covering 20 km he rested for 30 minutes. He then continued at an average speed of 40 km/h.

Complete the graphs of the journeys.

At what time did they meet?

- A 9.00 a.m
- B 8.40 a.m
- C 9.10 a.m
- D 8.50 a.m

Response Pattern

Option	A*	B	C	D
% Choosing Option	29.05	27.67	27.61	13.84
Mean mark in other question	27.25	20.84	23.21	21.74

This question tested candidates' ability to read and interpret graphs. The correct Option was A (9.00a.m). Candidates needed to complete the journeys of Chebet and Keya. Chebet's journey is uninterrupted while Keya stops for 30 minutes after 20 km then proceeds at 40km/h. The two travellers will meet at 9.00 a.m. 29.05% of the candidates chose the correct option. These were the bright candidates who were able to draw and read the graph according to the scale provided. Those candidates who chose the other options were merely guessing.

Question 47

Which one of the following expressions is the simplest

form of $\frac{7(2r+3)+4r-3}{2(r+1)+4r+7}$?

- A $\frac{6r+6}{2r+3}$
- B $\frac{6r+8}{2r+3}$
- C $\frac{9r}{3r+4}$
- D $2\frac{1}{2}$

Response Pattern

Option	A*	B	C	D
% Choosing Option	30.94	36.16	19.38	11.40
Mean mark in other question	29.00	21.46	20.36	20.60

This question tested candidates knowledge on simplification of algebraic expressions. The correct option was A $\left(\frac{6r+6}{2r+3}\right)$. This option was chosen by 30.94% of the candidates. The option was chosen by the bright candidates as indicated by the mean mark of 29.00 in other questions. Those who opened the brackets correctly were able to obtain the correct option. Those who chose Option B were able to open the brackets but misread the minus sign for positive. Those who chose Option C opened the brackets using the first entries only. Those who chose Option D merely cancelled out the unknown r.

5.3 GENERAL COMMENTS

There is need for candidates to carefully read the items and understand the tasks as demanded by the questions. Misunderstanding the tasks asked leads to responding to an incorrect answer.