5.0 MATHEMATICS

In the year 2011, **768,610** candidates sat for the KCPE Mathematics examination. The candidates registered a mean score of **26.16** with a standard deviation of **10.01**. This was a slight drop in performance when compared to the performance in the year 2010, which had a mean score of **26.90** with a standard deviation of **10.26**.

5.1 GENERAL PERFORMANCE

Table 10: General Performance in Mathematics for the last five years

Year	2007	2008	2009	2010	2011
National Mean	24.62	23.58	24.78	26.90	26.16
Standard Deviation	10.38	9.96	10.09	10.26	10.01

From *table 10* above, it can be observed that the performance in 2011 KCPE Mathematics dropped slightly compared to that of the previous year except for year 2008.

Table 11: General Performance in 2011 KCPE by Gender

Gender	Male	Female
Entry	397,127	371,483
National Raw Mean	27.21	25.04
Standard Deviation	10.32	9.54

From *table 11* above, it can be observed that:
(i)   Male candidates performed better with a mean sore of 27.21 compared to female candidates who had a mean score of 25.04.
(ii) Male candidates had a better spread in scores distribution than females candidates.
(iii) There were more male candidates than female who sat for the Mathematics paper in the year 2011 KCPE examination.

Table 12: Performance in 2011 KCPE Mathematics on each content area of the syllabus

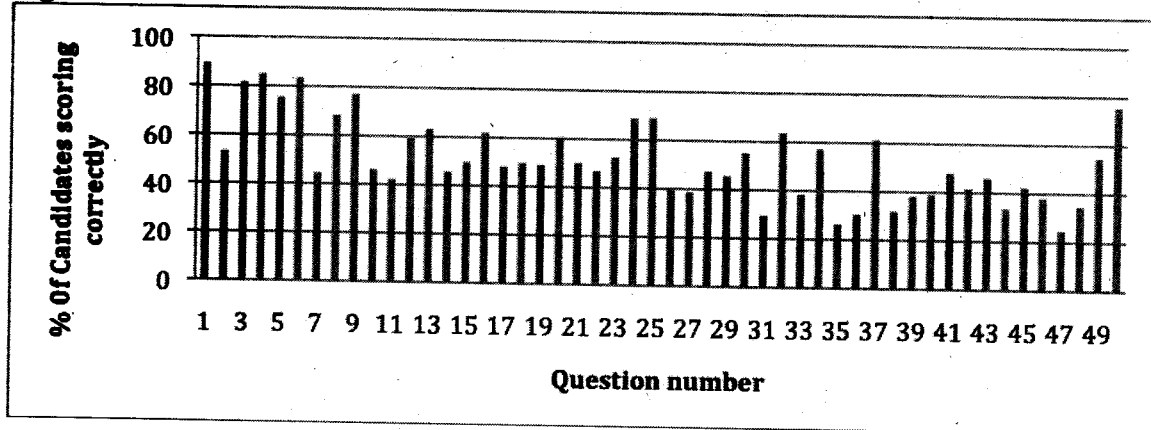| Content Area	No. of Questions	% of candidates scoring correctly
Numbers	14	38.59
Measurement	10	42.62
Geometry	9	49.82
Money	8	54.16
Algebra	3	44.41
Percentage Profit/Loss	2	44.83
Graphs	2	47.96
Statistics	1	63.09
Average Speed	1	22.26

From *table 12* above, it can be observed that:

(i)   Candidates performed better in content area involving money and statistics than in other areas of the syllabus.

(ii) Candidates performed poorly in content area involving average speed.

5.2   ANALYSIS OF PERFORMANCE IN SELECTED ITEMS

From *figure 5* below, it can be noted that few items had a facility index of 30% and below. However, there were many questions which had a facility index of 40% and below. Some of these questions shall be considered for detailed discussion and analysis.
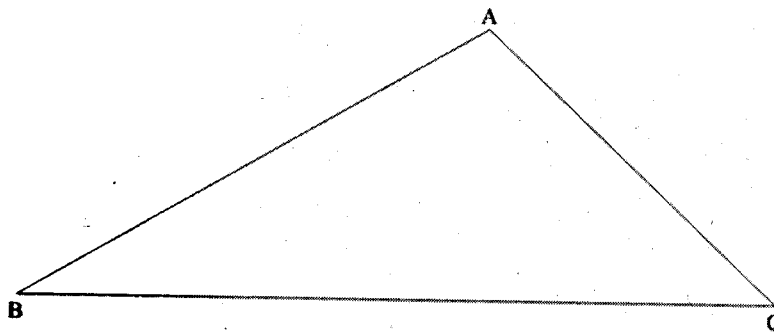
Figure 5

The discussion below will focus on analysis based on the concept and skills the items discussed tested and the cognitive processes the candidates presumably underwent to arrive at the correct responses.

Question 26

In the triangle ABC below, construct a perpendicular from A to meet line BC at N.

Which one of the following statements is correct?
A. Line AN bisects line BC
B. Angle BAN is equal to angle CAN
C. Angle ANB is equal to angle ANC
D. Line AB is equal to line BN.

Response Pattern for Question 26

Option	A	B	C*	D
%Choosing option	32.02	17.83	39.49	9.44
Mean mark in other questions	24.15	23.94	30.51	19.10

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The question tested candidate's skills on construction and knowledge on angle and line properties of triangles. Candidates were expected to drop a perpendicular line from point A of triangle ABC to meet line BC at N and then chose the correct response from the given statements.

The correct response is C **(Line ANB is equal to angle ANC)**. Angle ANB = Angle ANC = 90°. Candidates who chose option A had not conceptualized the meaning of bisection; to them bisection meant division into two instead of division into two equal parts. The candidates who chose options B and D had no idea on angle and line properties of triangles as far as lines and angles are concerned.

Apart from testing candidates' knowledge on angle and line properties of triangles, the question also tested candidates' analytical skills in choosing the correct response.

Teachers are advised to not only impart knowledge but also guide their pupils in analyzing given tasks in a question, accordingly.

Question 31

Halima bought 50 bananas @ sh3 each. She spent sh75 for transportation. During transportation 5 bananas got spoilt but she sold the rest making a 20% profit. For how much did she sell each banana?

A. sh 4.00
B. sh 5.40
C. sh 5.60
D. sh 6.00

Response pattern for question 31

Option	A	B	C	D*
%Choosing option	26.54	23.49	18.87	29.49
Mean mark in other questions	28.17	23.07	22.71	29.16

The question tested on commercial skills. The correct option is **D (6.00)**. Candidates who chose option **A (4.00)** treated profit to mean loss. Those who chose option **B (5.40)** did not consider the spoilt bananas while, those who chose option **C (5.60)** added the amount spent on transportation to the amount used to buy the bananas.

Teachers are advised to offer pupils more exercises on profit and loss in order to help them correct misconceptions.

Question 33

Mutuma left Mombasa on Tuesday at 6.30 p.m. and took 8 hours 45 minutes to reach his home. On what day and at what time in a 24 hour system did he reach home?

A. Wednesday 0315 h
B. Wednesday 1515 h
C. Tuesday 1515 h
D. Tuesday 0315 h

Response pattern for question 33

Option	A*	B	C	D
%Choosing option	38.37	40.52	12.86	6.87
Mean mark in other questions	30.64	24.43	21.48	20.75

The question tested on time in 12 hour and 24 hour systems. The correct option was **A (Wednesday 0315h)**. The candidates who chose option **B (Wednesday 1515hr)** and option **C (Tuesday 1515h)** merely added the 8 hours 45 minutes to the time Mutuma left Mombasa disregarding changing 6.30 p.m. to 24 hour system. The candidates who chose option **D (Tuesday 0315h)** did not take into account that Mutuma reached home on Wednesday.

Question 35

A car travelled 216 km at an average speed of 48 km/h. On the return journey the average speed increased to 72 km/h. Calculate the average speed, in km/h, for the whole journey?

A. 57.6
B. 60
C. 28.8
D. 68.6

Response pattern for question 35

Option	A*	B	C	D
%Choosing option	26.26	23.10	29.86	18.90
Mean mark in other question	31.98	22.75	24.86	24.52

The question tested on Average Speed. The correct option was **A (57.6)** chosen by bright candidates as shown by the mean mark of **31.98** in other questions. Majority of the candidates **(29.86%)** chose option **C (28.8)**; these are the candidates who did not consider the distance of the return journey. The 23.10% of the candidates who chose option **B (60)** merely worked out the average of the speed for the journey and that of the return journey. Those who chose option **D (68.8)** merely used guesswork.

5.3   GENERAL COMMENTS

From the above analysis it can be noted that:

5.3.1   There were three questions with a facility index of 30% and below while four questions had a facility index of 80% and above an indication that there were only a few. The questions were either too difficult or too easy for the candidates.

5.3.2   The difficult questions that registered a facility index of 30% and below were mostly from numbers 40 to 50. This is an indicator of most candidates not completing answering questions.

5.3.3   Average speed registered a facility index of 26.26% proving to be the most difficult content area. Teachers are advised to be keen in this area when teaching the concepts involved to the pupils.