3.8 AGRICULTURE (443)

In the year 2017, K.C.S.E Agriculture Examination consisted of three papers; Paper 1, Paper 2 and Paper 3. The three papers tested the candidates' competence in understanding the agricultural principles concepts and practices as stipulated in the syllabus. A wide range of knowledge and skills was tested in order to bring out the different abilities of the candidates. The format of the three papers is as follows:

- **Paper 1 (443/1):** This is a theory paper that covers General Agriculture, Crop Production, Agriculture Economics and Soil and Water Conservation. It has three sections A, B and C, which are marked out of 30, 20 and 40 marks respectively.

- **Paper 2 (443/2):** It is also a theory paper but covers Livestock Production, Farm Power, Farm Machinery, Farm Structures and Farm Tools and Equipment. It has three sections, A, B and C, which are also marked out of 30, 20 and 40 marks respectively.

- **Paper 3 (443/3):** This is a project paper with two project questions, **Project A** and **B**. In 2017, one of the projects required candidates to grow **cabbages or kales** while the second one was on rearing of **Rabbits**. Candidates selected and carried out only one of the two projects. The project paper is scored out of 100 marks.

3.8.1 CANDIDATES' OVERALL PERFORMANCE

The table below shows the general performance of candidates in the year 2017 KCSE Agriculture Examination. Performance in the previous five years has been included for comparison.

Table 15: Candidates overall performance in Agriculture for the last six years

YEAR	PAPER	CANDIDATURE	MAXIMUM MARK	MEAN SCORE	STANDARD DEVIATION
2017	1		90	26.21	13.86
	2		90	23.28	12.25
	3		20	5.41	2.31
	Overall	247,265	200	54.75	26.82
2016	1		90	26.21	14.28
	2		90	28.88	15.77
	3		20	5.66	2.34
	Overall	228,443	200	61.75	30.83
2015	1		90	43.91	17.19
	2		90	36.45	17.19
	3		20	9.29	3.02
	Overall	206,127	200	89.61	34.62
2014	1		90	40.93	15.75
	2		90	31.47	12.85
	3		20	8.63	2.76
	Overall	191,362	200	83.00	29.29
2013	1		90	29.80	13.53
	2		90	31.22	14.30
	3		20	6.19	2.28
	Overall	178,771	200	67.19	28.26

The following observations can be made from the summary in the table:

(i)   Candidates' performance in Agriculture dropped. This is shown by the drop in the overall mean score from **61.75.00** in 2016 to **54.75** in 2017. **Paper 1 (443/1)** mean score dropped from **27.41** in 2016 to **26.21** in 2015. The mean score for **Paper 2 (443/2)** dropped from **28.88** in 2016 to **23.28** in 2017.

(ii)   The overall standard deviation was **26.82.** The value of the standard deviation indicates that the papers were able to adequately discriminate candidates of different abilities.

(iii)   The candidature increased from **228,443** in 2016 to **247,265** in 2017. A similar trend was also observed in the years 2015, 2014, 2013, 2012 and 2011. This is a likely indication of increasing popularity of the subject in schools.

3.8.2   ANALYSIS OF POORLY PERFORMED QUESTIONS

Below is an analysis of the items that posed some challenge to the candidates. This report highlights the questions and gives the expected responses. It also offers a general advice to teachers on the possible methodologies to emphasise during instruction.

3.8.3   Agriculture Paper 1 (443/1)

Only one question was reported by the Chief Examiner to have been difficult.

Question 19

A farmer is advised to apply 60 kg N, 20 kg P2O5 and 30 kg K2O per hectare. Calculate the quantity of urea (46% N), single super phosphate (20% P2O5) and muriate of potash (50% K2O) the farmer should apply on his 10 hectares' land.   (5 marks)

Weaknesses

Most of the candidates were not able to relate the fertilizer grade (nutrient content) to 100 kg of the fertilizer.

Expected responses

    60 kg N
    20 kg P_2O_5
    30 kg K_2O
    Land size = 10 ha
  i)   Urea = 46kgN – 100kg Urea;
       = 60 x100/46 x 10 ha;
       = 1,304.305 kg of urea;

  ii)   SSP (20% P_2O_5)
         20 kgN – 100kg Urea
      =20 x100/20 x 10 ha
      = 1000 kg of SSP;

iii)   Muriate of Potash (50% K₂O)
      50 kg K₂O – 100kg Muriate Potash
         = 30 x 100/50 x 10 ha
         = 60 kg/ha
         = 60 x 10
         = 600 Muriate of Potash;
         5 x1

3.8.4   Agriculture Paper 2 (443/2)

Only one question was reported by the Chief Examiner to have been difficult.

Question 12

Explain how each of the following is measured in cattle:

(a) blood temperature   (□ mark)

(b) respiratory rate   (□ mark)

(c) pulse rate.   (□ mark)

Weaknesses

Most of the candidates were unable to explain how blood temperature, respiratory rate and pulse rate are measured In cattle.

Expected responses
a) Using clinical/veterinary thermometer inserted in the rectum;
b) Using a respirometer; observing and counting the rate of inspiration/expiration per minute;
c) Place a finger or thumb on an artery passing on a bone or on the lower edge of the animal jaw;

3.8.4   Agriculture Paper 3 (443/3 – PROJECT)

The agriculture project paper is administered to provide an opportunity for the candidates to show an put into practice, the psychomotor skills acquired during the four years period in secondary school.

Candidates are tested in practical skills in the growing of a selected crop from land preparation t harvesting, rearing selected livestock to maturity or constructing a farm structure such as beehive, fee trough, rabbit hutch, compost pit/heap, among others.

The instructions are taken to schools, which then provide the required inputs for candidates to car out the project work independently. The project takes eight months, from February to September of th given year.

In the year 2017, candidates chose between Cabbage/kale production and rabbit rearing. The agricultu teacher's duty was to objectively assess and evaluate each candidate's work at all the stages of proje implementation. **The assessment by the teacher should be on the basis of the class such that there**

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an even distribution of scores from the lowest, average and finally to the highest performers.

3.8.5 GENERAL ADVICE TO TEACHERS

(i)   The whole syllabus should be effectively covered during instruction because   examination items will be sampled from the entire syllabus. A topic should not be ignored because it was recently or is never tested. All the topics are tested.

(ii)   The teacher/school should acquire the relevant reference materials and assist candidates to obtain and use the recommended textbooks. The approved books are found in the orange book published by the Kenya Institute of Curriculum Development.

(iii)   The use of textbooks by teachers should always be guided by the syllabus. The specific objectives stipulated in the syllabus should be correctly interpreted to ensure the topics in question are taught at the appropriate breath and depth.

(iv)   A variety of teaching methods and resources should be utilised by teachers to ensure that the content is effectively delivered during instruction. Resource persons/guest speakers and field visits should be arranged and used in areas where the teacher and the school lack the resources to teach the topic/lesson effectively. Agriculture is a science and should be treated accordingly during instruction. The teaching and learning process should go beyond the mere statement of facts. The candidates should be able to explain and apply the knowledge acquired during instruction. Many candidates had problems in answering questions of high cognitive demand.

(v)   All the suggested practical activities in the syllabus should be carried out to prepare candidates adequately for questions that require application of psychomotor skills acquired during instruction.