3.8 AGRICULTURE (443)

In the year 2022, 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 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 2023, one of the projects required candidates to grow kales, maize, carrots or strawberry while the second one was on rearing of chicken or 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 2022 KCSE Agriculture Examination. Performance in the previous five years has been included for comparison.

Table 17: Candidates overall performance in Agriculture for the last six years

Year	Paper	Candidature	Maximum Mark	Mean Score	Standard Deviation
2022	1		90	44.19	19.71
	2		90	44.96	18.24
	3		20	9.31	3.42
	Overall	**327,993**	**200**	**98.06**	**39.30**
2021	1		90	29.55	15.38
	2		90	42.01	18.78
	3		20	06.12	2.49
	Overall	**317,692**	**200**	**77.28**	**34.22**
2020	1		90	39.08	17.05
	2		90	56.29	21.40
	3		20	8.15	2.99
	Overall	**300,878**	**200**	**102.66**	**39.70**

Year	Paper	Candidature	Maximum Mark	Mean Score	Standard Deviation
2019	1		90	31.09	15.39
	2		90	27.27	12.68
	3		20	6.46	2.34
	Overall	**289,315**	**200**	**64.82**	**28.83**
2018	1		90	20.81	11.78
	2		90	31.58	15.20
	3		20	4.24	1.88
	Overall	**278,658**	**200**	**60.57**	**27.36**
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**

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

(i) Candidates' performance in Agriculture improved. This is shown by the increase in the overall mean score from **77.28** in 2021 to **98.06** in 2022. **Paper 1 (443/1)** mean score improved from **29.55** in 2021 to **44.19** in 2022. These mean scores indicate that the candidate's performance was close to the expected ideal mean.

(ii) The overall standard deviation also improved from **34.22** in 2021 to **39.30** in 2022. The value of the standard deviation indicates that the candidates' scores were well spread from the mean. The papers therefore adequately discriminated candidates of different abilities.

(iii) The candidature increased from **317,692** in 2021 to **327,993** in 2022. A similar trend was also observed in the years 2020, 2019, 2018, 2017 and 2016. This is a likely indication of increasing popularity of the subject in schools.

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.

3.8.2 Agriculture Paper 1 (443/1)

No question was reported by the Chief Examiner to have been difficult However, candidates had challenges in handling the following questions:

Question 16

16. If a tomato crop is planted at a spacing of 100 cm by 50 cm, calculate the plant population for a plot of land measuring 5 m by 6 m. (5 marks)

Expectation
This question required candidates to determine plant population.

Weaknesses
Most of the candidates were not able to convert the different measurements (cm and m) given to either centimetres or metres. Instead, they worked out as if the measurements were in the same units.

Advice to teachers
Learners should be engaged on tasks that involve different units of measurement.

Expected responses.

16. Plant population

$$= \frac{\text{Area of land}}{\text{Spacing}}$$

$$= \frac{5\text{ m} \times 6\text{ m}}{100\text{ cm} \times 50\text{ cm}}$$

$$= \frac{500 \times 600}{100 \times 50}; = \frac{300,\cancel{000}}{5\cancel{000}};$$

= 60 plants; 5 x 1 = (5 marks)

Question 17

The diagram below shows a method of grafting.

(a) Identify the method of grafting. (1 mark)

(b) Name **two** other methods of grafting apart from the one illustrated. (2 marks)

(c) Give **two** reasons why a farmer may prefer using the grafting method illustrated. (2 marks)

Expectation
The candidates were required to identify side grafting, other types of grating and when it is appropriate to use side grafting.

Weaknesses
Most of the candidates confused grafting with layering and budding.

Advice to teachers
Instruction should emphasize types of grafting and when each is applied.

Expected responses

17. (a) Side grafting;

(b)
- Whip/ tongue;
- Approach;
- Bark;
- Notch;

(c)
- When the scion is smaller in diameter than the root stock;
- To repair damaged trees;
- To produce different types of fruits on the same root stock;
- To utilize a high quality root stock.

3.8.3 Agriculture Paper 2 (443/2)

No question was reported by the Chief Examiner to have been difficult However, the following questions were a challenge to some candidates.

Question 13

(a) State the colour difference between the Galla and Saanen goat breeds. (1 mark)

(b) Name **one** goat breed that is reared for:

(i) mohair (½ mark)

(ii) meat (½ mark)

Expectation
The candidates were required to (a) distinguish between Galla and Saanen goats and (b) name a goat that is reared for (i) mohair and (ii) meat.

Weaknesses
Most of the candidates confused the distinguishing characteristics of the goats and purposes for which different goat breeds are reared.

Advice to teachers
Emphasize the distinguishing characteristics of different breeds of livestock and the purpose they are reared.

Expected responses

(a) Colour difference between Galla and Saanen. Saanen is white with pink stain while Galla is white with black stain.

(b) (i) Goat used for mohair - Angora goat.

(ii) Meat goats: Small East African Goat; Galla, Boer:

Question 15

State **one** use of each of the following farm tools:

(a) pruning hook (½ mark)

(b) dosing gun (½ mark)

(c) bow saw (½ mark)

(d) crowbar (½ mark)

Expectation
The candidates were required to give functions of the farm tools.

Weaknesses
Most of the candidates confused the functions of farm tools.

Advice to teachers
Practically guide learners on how to use farm tools and equipment.

Expected responses

15. One use of:

(a) **Pruning hook** - Hook down branches high up on the tree to enable the farmer to reach them for purpose of pruning.

$1 \times \frac{1}{2} = \frac{1}{2}$ **mark**

(b) **Dosing gun** - giving oral liquid drugs to animals

$1 \times \frac{1}{2} = \frac{1}{2}$ **mark**

(c) **Bow saw** - cutting logs or thick pieces of timber

$1 \times \frac{1}{2} = \frac{1}{2}$ **mark**

(d) **Crowbar** – Removing long nails from timber/ wood
- Straining fencing wire
- Digging fencing holes

$1 \times \frac{1}{2} = \frac{1}{2}$ **mark**

3.8.4 Agriculture Paper 3 (443/3 –PROJECT)

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

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

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

In the year 2022, candidates chose one project from kales, maize, strawberry, watermelon, chicken and rabbit rearing. The agriculture teacher's duty was to objectively assess and evaluate each candidate's work at all the stages of project implementation.

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.