16.0 AGRICULTURE (443)

The KCSE Agriculture examination for the year 2006 tested candidates' competence in understanding the agricultural principles, concepts and practices as stipulated in the syllabus. The examination which tested a wide range of skills and knowledge consisted of the following papers:

- **Paper 1(443/1)** : This was a theory paper which comprised questions on ***crop production, agricultural economics, soil science, introduction to agriculture*** and ***factors influencing agricultural production***. This paper consisted of three sections ***A, B*** and ***C*** and was marked out of 90 marks.

- **Paper 2 (443/2)**: This was also a theory paper which comprised questions on ***livestock production and health, agricultural engineering (farm tools and equipment, farm structures***, and ***farm power and machinery)***. The paper consisted of three sections ***A, B*** and **C**, had similar weighting as paper 1(443/1) and was also marked out of 90 marks.

- **Paper 3 (443/3)**: This was a project paper which comprised of two main agricultural projects from which the candidates were expected to select only one to carry out. The projects were on ***"rabbit rearing"*** and ***"the production of maize, sorghum, millet or cabbages"***. The schools were expected to select and prepare materials for only one project from those listed above during the course of the project period.

It should be noted that this was the first time the new syllabus was being tested using a completely new format. There was definitely a deviation from the format the candidates were used to.

16.1 GENERAL CANDIDATES' PERFORMANCE

The table below shows candidates' performance in the KCSE Agriculture examination in the year 2006.

Table 19: Candidates' Overall Performance in Agriculture in the Year 2006

Year	Paper	Candidature	Maximum Marks	Mean Score	Standard Deviation
2006	1		90	32.67	11.99
	2		90	37.53	12.57
	Overall	**107,068**	**180**	**77.56**	**24.00**

This year's report undertakes to analyse the candidates' performance in the year 2006 KCSE Agriculture examination. It attempts to highlight the questions that were poorly performed and gives advice to teachers on how to improve performance in the future.

16.2 PAPER 1 (443/1)

The questions discussed below were poorly performed by candidates in Agriculture paper 1 (443/1).

Question 1

Differentiate between Olericulture and Pomoculture as used in crop production.

Weaknesses

Majority of candidates did not give correct responses here apparently due to the fact that they had not bothered to do a thorough revision on this part of the agriculture syllabus. It appears teachers ignored this area since it is part of work normally covered in form one.

Expected Response

Olericulture is growing of vegetables while ***pomoculture*** is the growing of fruits.

Advice to Teachers

Teachers should not neglect any part of the syllabus even if it is the work which was covered in form one.

Question 14

What is profit maximization in agricultural economics?

Weaknesses

Although this question looked quite simple, most of the candidates did not get it right. Perhaps this was due to lack of proper mastery of the economics concepts. The candidates could not relate the concept of total revenue with total cost and also marginal revenue.

Expected Response

Profit maximization is the point in a production process where the highest net returns (net revenue) on invested capital is realized / when the difference between total revenue (TR) and total cost (TC) is the highest point in a production process where profit is highest/ a profit at which marginal cost (MC) is equal to or almost equal to marginal revenue (MR)

Advice to Teachers

Teachers should use relevant examples plus appropriate graphical illustrations to help the learners understand the concepts involved in profit maximization.

Question 16

*Give **two** reasons why farmers keep farm accounts.*

Weaknesses

Majority of candidates confused the ***"farm accounts"*** with ***"farm records"*** as was evidenced by their responses. This was probably due to inadequate preparation in this area of the agriculture syllabus. Most candidates were unable to distinguish between accounts and records.

Expected Responses

- To keep check on income and expenditure/ determine profits and losses.
- To know which activities are financially viable/weakness and strength of the business.
- To obtain knowledge of the total value of the farm/ the value of assets and liabilities.
- For farming planning.
- To assess credit worthiness.
- To provide information for tax purposes.

Advice to Teachers

During revision work the teacher should try to help the students to distinguish between the two concepts by using simple relevant examples.

Question 21 (b), (i), (ii) and (iii)

Use the information on the table below to answer the questions that follow.

Fertilizer input (units)	Maize yield (bags)	Marginal product (bags)
0	50	-
1	62	12
2	66	4
3	68	2
4	69	1
5	69	0

The cost of fertilizer is Sh 1 500 per unit and the price of maize is Sh 1200 per bag.

(i) *At what unit of fertilizer input should the farmer be advised to stop applying any more fertilizer to the maize?*

(ii) *Give a reason for your answer in (b) (i) above.*

(iii) *Calculate the marginal return at the point of optimum production.*

Weaknesses

Majority of candidates performed very poorly in this question due to the fact that they did not analyse the data contained in the table given above carefully. As a result of this, they gave wrong responses.

Expected Responses

(b) (i) At the end of the third (3^{rd}) unit of fertilizer application.

(ii) This is the last profitable unit of fertilizer application beyond which there would be a loss.

(iii) Marginal returns (MR) at the point of optimum production MR=Sh.1,200 x 2 =Sh. 2,400

Advice to Teachers

Teachers should ensure that they give students more practice on similar problems so that they can master how to interpret data and calculate marginal returns or such like economic problems.

Question 22(a)

Describe the procedure which should be followed in spraying a crop of tomatoes using a fungicide in powder form, water and a knapsack sprayer.

Weaknesses

Majority of candidates did not realize that when a chemical is given in powder form it must first be dissolved in water in order to make slurry before it is mixed with water for spraying.

The other problem was that candidates left out the main steps in the process of spraying and instead gave incorrect responses on the precautionary measures that should be taken. This led to poor performance of candidates in the question.

Expected Responses

- Read the label/ the manufacturers instructions.
- Measure the required amount of fungicide.
- Place it into a container and mix thoroughly with a little amount of water to ensure that the powder has dissolved completely/has formed slurry.
- Pour the mixture into the knapsack sprayer through the sieve.
- Add water up to required level in the knapsack sprayer.
- Spray the mixture on the crop.

Advice to Teachers

Teachers should assist students through well planned and organized practical activities to carry out procedures of this nature step by step so that the students can be able to remember what is required. The importance of each step in the procedure should be emphasized in order to eliminate the confusion with the precautions.

16.3 PAPER 2 (443/2)

Generally, the performance in this paper was fairly satisfactory compared to that of paper 1 (443/1). This average performance was attributed to the fact that the candidates were still adjusting themselves to the new format which they are yet to get used to. Otherwise the questions discussed here below are among those which were poorly performed by candidates.

Question 7

*State **four** construction features necessary in a fish pond*

Weaknesses

Most candidates were confused here because some of them gave responses responding to the site requirements of the fish pond rather than the constructional features.

Expected Responses

- An outlet to drain off excess water.
- An inlet for fresh water supply.
- A spilled way channel to take away excess water/overflow water.
- A screen to prevent escaping of fish/entry of unwanted objects/fish.

Advice to Teachers

Teachers should attempt to cover a topic of this nature through appropriate practical activities. Perhaps if students are taken for an educational visit to a fish farm they would be in a better position to respond to such a question.

Question 12

*Give **four** reasons why camels are suited to living in arid areas.*

Weaknesses

Most candidates did not perform well in this question probably because the teachers might have ignored covering this part of the syllabus took it for granted that nothing would be set on camels. Majority of candidates only mentioned the heat tolerance and ability to do with very little or no water but forgot the other important characteristics of features.

Expected Responses

- They can browse and survive on poor vegetation.
- They have hooves with hardy pads which enable them to traverse large areas of sandy grounds.
- They are tolerant to high temperatures/have thick skin.
- They can travel long distances for several days with very little water.
- Stores fats in the lungs/fats which can be metabolized into water.
- Long eye lashes which prevent entry of dust/nose traps.

Advice to Teachers

Teachers should realize that camels are part of the syllabus and therefore adequate emphasis should be made when teaching about breeds of animals especially the general aspects of their management. Strategy should be adopted to ensure that most of the livestock breeds are covered adequately and appropriately revised.

Question 22(a)

Outline the procedure followed when hand spraying cattle to ensure effective use of acaricides to control ticks.

Weaknesses

Majority of candidates confused what was required here with the precautionary measures that are taken when one is handling chemicals generally. The responses given in most cases were therefore irrelevant to the question.

Expected Responses

- Spray the entire backline from the shoulders to the tail head.
- Spray the sides in a zigzag motion to trap and retain the wash from the backline.
- Spray the belly with the nozzle facing upwards.
- Spray the scrotum/udder and the hind flanks carefully.
- Spray both hind legs up to and including the heels.
- Spray under the tail head and the area around the anus and vulva.
- Hold the tail switch on to the rump and spray it thoroughly to ensure complete wetting.
- Spray the neck and the fore legs from the flanks to the heels.
- Spray the head and face making sure that the bases of the horns are thoroughly wetted.
- Spray the inside of the ears.

Advice to Teachers

If teachers ensure that such activities are carried out practically then students will respond to such questions accordingly without bringing in issues like precautionary measures such as avoid spraying against the wind.

16.4 PAPER 3 (443/3)

Paper 3 (443/3) is a project paper which is supposed to test the candidate's practical skills in growing of a selected crop from land preparation to harvesting or rearing selected livestock to maturity. According to the instructions given to schools the candidates were expected to carry out the project work on their own after the school provided the necessary inputs required.

The project takes eight months, that is, from ***February to September*** of a given year. The Agriculture teacher, this time round, was expected to objectively assess and evaluate the candidates work at all stages.

This paper aims at testing the practical skills that the candidates acquire during the four year period in secondary school.

In the year 2006, the candidates had to choose between rearing of rabbits or either producing maize, sorghum, millet or cabbages. Most schools choose the rearing of rabbits. This could have been necessitated by cost implication involved in rearing livestock and the amount of time and care required for such a project.

16.5 GENERAL ADVICE TO TEACHERS

16.5.1 Teachers should strive to teach all the topics in the syllabus effectively because questions in the examination will be drawn from all parts of the syllabus ranging from topics covered from form one to form four.

16.5.2 It is important to note that correct interpretation of specific objectives in the syllabus will enhance effective teaching of the respective topics.

16.5.3 In order to prepare the learners adequately for the examination, especially the practical component, it is important that the teachers attempt to carry out all the suggested practical activities in the syllabus.

16.5.4 It is important to stress that the teachers should employ the use of a variety of teaching methods to effectively deliver the content. In case a specific topic requires a field trip/visit, it is important that such a trip is arranged to enhance understanding of the topic.