

## 16.0 AGRICULTURE (443).

The year 2008 K.C.S.E Agriculture Examination tested the candidates' competence in understanding the agricultural principles, concepts and practices as stipulated in the syllabus. The examination tested a wide range of knowledge and skills in order to bring out the different abilities of the candidates. The examination consisted of three papers, *Paper 1 (443/1)*, *Paper 2 (443/2)* and *Paper 3 (443/3)*.

- *Paper 1 (443/1)*: This was a theory paper covering *General Agriculture, Crop production, Agriculture, Economics* and *Soil and Water Conservation*. It had three sections, A, B and C, which were marked out of 30, 20 and 40 marks respectively.
- *Paper 2 (443/2)*: This was also a theory paper but covered *Livestock Production, Farm Power, Farm Machinery, Farm Structures* and *Farm Tools and Equipment*. It had three sections, A, B and C, which were also marked out of 30, 20 and 40 marks respectively.
- *Paper 3 (443/3)*: This was a project paper with two project questions, *Project A* and *B*. Project A required candidates to prepare *Compost Manure* while B was on production of either *Carrots* or *Bulb onions*. Candidates selected and carried out only one of the two projects.

### 16.1 CANDIDATES' OVERALL PERFORMANCE.

The table below shows the general performance of candidates in the year 2008 K.C.S.E Agriculture Examination. Performance in the years 2006 and 2007 has also been included for comparison.

*Table 21: Candidates' Overall Performance in Agriculture in the years 2006, 2007 and 2008*

Year	Paper	Candidature	Maximum Mark	Mean Score	Standard Deviation
2006	1	107,068	90	32.67	11.99
	2		90	37.53	12.57
	overall		180	77.56	24.00
2007	1	121,193	90	26.94	12.04
	2		90	53.98	16.89
	Overall		180	87.34	28.00
2008	1	134,039	90	32.32	15.11
	2		90	25.59	11.64
	Overall		180	67.10	27.32

The following observations can be made from the table above:

- 16.1.1 Candidates' performance in *paper 1 (443/1)* improved. This is shown by the rise in the mean score from **26.94** in the year 2007 to **32.32** in the year 2008. The mean score for *paper 2 (443/2)* drastically dropped from **53.98** in the year 2007 to **25.59** in the year 2008.
- 16.1.2 The candidates' overall performance declined as shown by the subject mean score, which declined from **87.34** in the year 2007 to **67.10** in the year 2008.
- 16.1.3 The overall standard deviation for the whole paper declined from **28.00** in the year 2007 to **27.32** in the year 2008.
- 16.1.4 The candidature increased from **121,193** in the year 2007 to **134,039** in the year 2008. A similar trend was also observed between the year 2006 and 2008. This is a likely indication of increasing popularity of the subject in schools.

A number of questions in the year 2008 K.C.S.E Agriculture examination were not adequately answered and as a result, candidates posted low performance in the items. This report highlights these questions, giving the expected responses and advice to teachers on the possible methodologies to emphasize during instruction.

## 16.2 PAPER 1 (443/1)

### Question 5

State **two** effects of siltation in dams.

The item required candidates to apply the knowledge acquired from soil erosion and water pollution to respond to the question.

#### Weaknesses.

Most candidates interpreted the word “*siltation*” to be derived from the word salt.

#### Expected Responses

- Causes water pollution.
- Interferes with hydroelectric power generation.
- Leads to decline in fish population.
- Reduction of water volume.

#### Advice to Teachers.

During instruction, teachers should emphasize and ensure that learners understand the technical terms used in agriculture.

### Question 26(a)

State and explain **five** roles of agriculture in economic development of Kenya.

The question was derived from the sub-topic, “*Role of Agriculture in the Economy*”. Candidates were expected to state the roles and explain the contribution of each role in economic development.

#### Weaknesses

Instead of giving explanations, most candidates repeated the roles to disguise them as explanations.

#### Expected Responses

- **Source of food supply:** It supplies food to the population. It ensures healthy and strong people who participate in economic development activities. Money saved is used on other economic activities.
- **Source of employment:** It provides direct employment to farmers and farm workers and indirect employment in the agro-based industries. It provides employment to over 70% of Kenya’s population.
- **Foreign exchange earner:** Through exportation of agricultural products such as tea, coffee, pyrethrum, horticultural and livestock products. Foreign currency earned is then used to import products such as machinery. Saves money that would have been put on importing these commodities.
- **Source of raw materials for industries:** Most agricultural products such as rice, hides and skins, coffee, tea, etc require processing before use. Industries such as rice mills, leather

- tanning and canning factories have been set up to use them as raw materials.
- ***Provides market for industrial goods:*** It provides a market for industrial goods such as agro-chemicals, tools, equipment and machinery.
  - ***Source of income/revenue:*** This is used to purchase farm inputs such as tools, fertilizers, pesticides and machinery. The government earns revenue from income tax on agricultural produce to finance development projects.
  - ***Promotes international relationships:*** This creates jobs and foreign market.

#### **Advice to Teachers**

The candidates should be developed and trained on how to interpret the rubric and respond to essay items that require a restricted response. The requirements of specific objectives in the syllabus should be effectively addressed during instruction.

#### **Question 28(a)**

**Explain why settlement schemes were established in Kenya soon after independence.**

The item was developed from the sub-topic, “***Settlement and Resettlement***” in the syllabus. It required candidates to explain the objectives of land settlement and resettlement.

#### **Weaknesses**

Most candidates were able to state the objectives of establishing settlement schemes but could not give explanations. Instead, most of them repeatedly wrote the objectives for settlement and resettlement.

#### **Expected Responses**

- To transfer land from Europeans to Africans to enable Africans to own land.
- To settle the landless/squatters by transferring them to new land allocations.
- To make use of underutilized/idle land to increase production.
- To create employment /self-employment opportunities on farms to increase production of crops and livestock.
- To increase agricultural production through better methods of land utilization and foreign markets for increased exports to earn foreign exchange.
- To ease population pressure on land by transferring people from overpopulated areas to sparsely populated areas.

#### **Question 28(b)**

**State and explain the various land tenure systems practised in Kenya.**

The question was set from the sub-topic, “***Land Tenure Systems***” in the syllabus. Candidates were expected to give the different types of land tenure systems and the unique features of each through an explanation.

#### **Weaknesses**

Most candidates were not able to give an explanation to each of the land tenure systems they had written.

#### **Expected Responses**

- **Leasehold/landlordism/tenancy:** It gives an individual the right to own and use land at a fee for a specific period. It gives legal rights to a tenant to use land.
- **Company/concession/plantation:** A company and the government enter an agreement on the use of land for a specific period.
- **Communal land tenure:** The whole community has the right to the use of land/each member of the community has equal rights to use of land.
- **Individual ownership/individual owner operator/freehold:** Land is owned by an individual/farmer who either makes use of it or leases to another person to farm.
- **State ownership:** The government (state) controls land use/the right to use of land.
- **Co-operative land tenure:** Land is owned by a group of members (co operative) who run it on co-operative basis.

#### Advice to Teachers

The instruction should be tailored to the specific objectives stipulated in the syllabus and learners trained on how to answer essay questions that require restricted responses.

### 16.3 PAPER 2 (443/2)

#### Question 7

**What is dry cow therapy?**

The item was developed from the topic, **Livestock Production** and required candidates to define dry cow therapy practice as used in dairy cattle management during drying off.

#### Weaknesses

Many candidates confused “*dry cow therapy*” with “*drying off*”.

#### Expected Responses

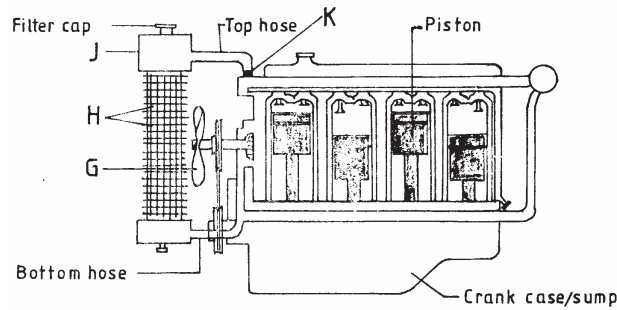
Is the application/infusion of antibiotics into the teat canals of the cow’s udder after drying off to prevent mastitis/bacterial infection.

#### Advice to Teachers

Topic areas involving practices in agriculture should be taught practically to enhance understanding and retention by learners/candidates.

#### Question 27

The diagram below shows the cooling system of a tractor engine. Study it carefully and answer the questions that follow.



- (a) Name the parts labelled **G**, **H**, **J** and **K**.
- (b) State the functions of the parts labelled **G**, **J** and **K** in the cooling system.

This question required candidates to identify and give the functions of the labelled parts of a tractor engine cooling system.

#### Weaknesses

Most candidates were not able to positively identify and give the functions of the labelled parts.

#### Expected Responses

- (a)
  - G:** Fan.
  - H:** Fin/radiator fin.
  - J:** Head tank.
  - K:** Thermostat.
- (b)
  - G (Fan):** Blowing air currents through the fins to cool the hot water coming from the engine block as it moves to the head tank for further circulation.
  - J (Head tank):** Holding/storing water for the cooling system.
  - K (Thermostat):** Regulation of water temperature in the engine.

#### Question 31

- (a) Describe how the following tractor components are used to attach implements to the tractor:
  - (i) Three (3) point linkage/hitch.
  - (ii) Power Take Off shaft (P.T.O)
- (b) Describe how the ignition system of a tractor petrol engine works.

In part (a) of the question, candidates were expected to give the procedure of attaching implements to a tractor using the three-point linkage and the power take off (P.T.O) shaft. In part (b) of the question, candidates were required to give the sequence of events during ignition.

#### Weaknesses

Most candidates avoided this question and the few who attempted it did not perform well. They were not able to single out how the various parts and modifications on the three-point hitch/power take off (P.T.O) shaft attach implements on a tractor.

#### Expected Responses

(a)

**(i) *The three-point linkage.***

- The three-point hitch/linkage is used to attach the trailed or mounted implements onto a tractor.
- The lower links are hitched to the lower links of the implement while the adjustable top link is attached to the top link of the implement.
- The adjustable top link on the tractor is used to lift the implement through the hydraulic power system when in operation or during transportation.
- The lower links are used to hold the implement in place to provide stability.
- The check chains on the lower links prevent the implement from coming into contact with the tractor tyres when the tractor is moving.

**(ii) *P.T.O Shaft.***

- It transmits power from the tractor engine to operate various mounted and stationary implements.
- The extension shaft of the P.T.O connects the P.T.O shaft to the implement shaft.
- The extension shaft has universal joints at both ends for adjusting the distance between the tractor and the implement.
- The short splined shaft at the rear of the tractor is also used for attaching/coupling to the implement.

(b)

- The battery/generator supplies sparks for ignition to occur.
- The ignition coil changes the low voltage from the battery to a high voltage current required by the spark plugs in petrol engine.
- The condenser absorbs self-induced current in the primary current to prevent the contact breaker points from excessive pitting.
- It stores electric current for a short time.
- The condenser passes on the electric current to the distributor, which distributes the high voltage current to the spark plugs.
- This causes a spark to occur in each cylinder in the required firing order.
- The contact breakers' function is to interrupt the normal flow of current in the primary circuits.
- The spark ignites the air-fuel mixture in the cylinder and the tractor engine starts.

(b)

- In this system the battery or generator supplies sparks which are required for ignition to take place.
- The ignition coil changes the low voltage from the battery to a high voltage current required in the spark plug in petrol engine.
- The condenser absorbs self induced current in the primary circuit hence preventing the contact breaker point from excessive pitting.
- It stores electric current for a short time
- The condenser passes on the electric current to the distributor which distributes the high voltage current to the spark plugs.
- This causes the spark to occur at each cylinder in the required firing order.
- The contact breakers' function is to interrupt the normal flow of current in the primary circuits.

- An electric spark from the plug then ignites the air-fuel mixture in the cylinder, then the tractor engine starts.

#### **Advice to Teachers**

Teachers should expose learners to the various components and systems of a tractor through practical lessons/demonstrations. Field visits to established farms with tractors should be used in schools where a tractor is not available. Guest speakers can be utilised in areas where the teacher is not well versed with the instruction content on tractors.

#### **16.4 PAPER 3 (443/3 –PROJECT).**

This is the agriculture project paper 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 tested in 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 2008, candidates chose between preparation of compost manure and production of either carrots or bulb onions. The agriculture teacher's duty was to objectively assess and evaluate each candidate's work at all the stages of project implementation.

#### **16.5 GENERAL ADVICE TO TEACHERS.**

- 16.5.1 The whole syllabus should be effectively covered during instruction because examination questions will be drawn from the entire syllabus.
- 16.5.2 The teacher/school should acquire the relevant reference materials and assist candidates to obtain and use the recommended textbooks.
- 16.5.3 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 adequately and effectively.
- 16.5.4 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.
- 16.5.5 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.