3.8   AGRICULTURE (443)

In the year 2014, 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 2014, Project A required candidates to prepare **compost manure** while B was on production of **beans or cabbages**. Candidates selected and carried out only one of the two projects. The 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 2014 KCSE Agriculture Examination. Performance in the previous five years has been included for comparison.

Table 16: Candidates overall performance in Agriculture for the last six years

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2014	1		90	40.93	15.75
	2		90	31.47	12.85
	3		20	8.63	2.76
	Overall	191362	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
2012	1		90	38.87	15.15
	2		90	25.61	12.86
	3		20	7.72	2.49
	Overall	178,419	200	69.96	28.85
2011	1		90	26.33	13.73
	2		90	40.30	15.29
	Overall	167,709	180	74.33	29.62
2010	1		90	24.82	11.58
	2		90	36.07	15.07
	Overall	140,237	180	67.96	27.12
2009	1		90	33.54	15.10
	2		90	34.91	13.49
	Overall	137,217	180	77.67	29.12

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 **67.19** in 2013 to **83.00** in 2014. **Paper 1 (443/1)** mean score improved from **29.80** in 2013 to **40.93** in 2014. The mean score for **Paper 2 (443/2)** slightly improved from **31.22** in 2013 to **31.47** in 2014.

(ii)   The overall standard deviation was **29.29**. The value of the standard deviation indicates that the two papers were able to adequately discriminate candidates of different abilities.

(iii)   The candidature increased from **178,771** in 2013 to **191,632** in 2014. A similar trend was also observed in the years 2013, 2012, 2011, 2010, 2009 and 2008. This is a likely indication of increasing popularity of the subject in schools.

3.8.2 ANALYSIS OF POORLY PERFORMED QUESTIONS

The following is the analysis of the items that were poorly performed by candidates in the year 2014 KCSE Agriculture examination. This report highlights these 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)

Question 2

Give **four** factors that can increase seed rates in crop production.   (2 marks)

Weaknesses
Most of the candidates did not comprehend the stem of the item. Instead of giving factors that increase seed rates, they gave the factors that influence seed rates.

Expected responses

(i)   Seed impurity;
(ii)   Low germination percentage;
(iii)   Close spacing;
(iv)   More seeds per hole / broadcasting;
(v)   Early planting / dry planting;

Question 10

What is meant by each of the following in agroforestry?

(a)   Pollarding;   (1 mark)

(b)   Coppicing;   (1 mark)

(c)   Lopping.   (1 mark)

Weaknesses
Most of the candidates were not able to define *pollarding, coppicing* and *lopping*.

Expected responses

(a)   Pollarding - cutting back the crown and the top branches of a tree;

(b)   Coppicing - cutting down trees about half a meter from the ground;

(c)   Lopping - cutting one or more branches from the stem;

Question 20 (a)

Describe the various risks and uncertainties in crop farming.   (10 marks)

Weaknesses
Most of the candidates were not able to describe the risks and uncertainties in crop production.

Expected responses

- Technology uncertainty.
- Price uncertainty.
- Personal injury or sickness.
- Government policy.
- Demand for a commodity uncertainty.
- Yield uncertainty.
- Theft of crop.
- Fire risk.
- Political instability.
- Labour uncertainty.
- Natural catastrophes.
- Pests and diseases.
- Obsolescence.

3.8.4   Agriculture Paper 2 (443/2)

Question 14

State **four** reasons why kids should be weighed immediately after birth.   (2 marks)

Weaknesses
Most of the candidates did not understand the reasons for weighing a kid after birth. Most of them only gave one response, ''to determine birth weight''.
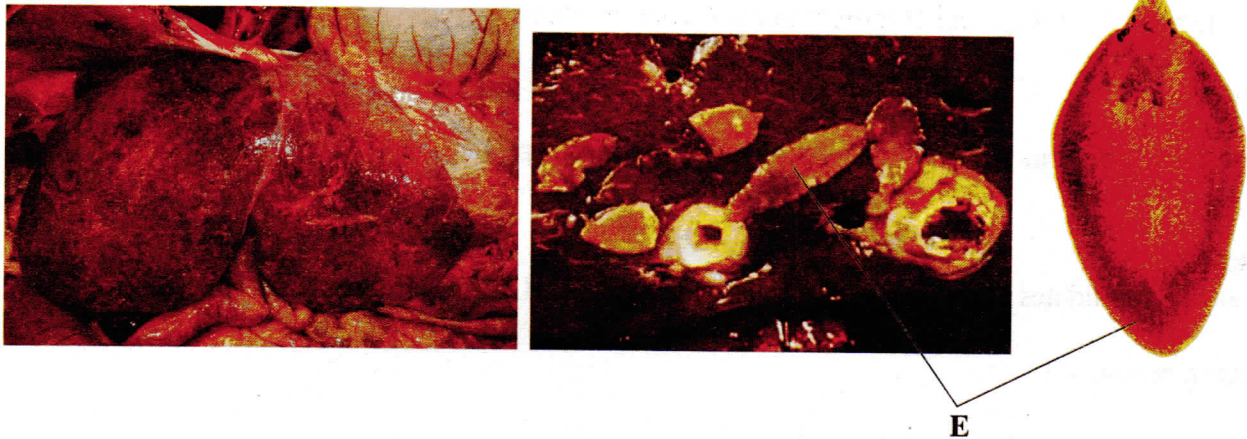
Expected responses

Manage market weight
Determine birth weight
Determine growth rate

Manage feeding
Determine weaning stage
Determine mothering ability

Question 16

The picture below illustrates a livestock organ infested by a parasite labelled **E**.

E

(a)	Name the disease the livestock is suffering from.	(1 mark)
(b)	Identify the parasite labelled **E**.	(1 mark)
(c)	State **two** control measures for the parasite.	(2 marks)
(d)	State **two** signs of infestation shown in the picture above.	(2 marks)

Weaknesses

16 (a) Most candidates were not able to name the disease.
16 (d) Many candidates were not able to infer the signs of infestation from the picture.

Expected responses

(a)   Fascioliasis;

(b)   *Fasciola hepatica*;

(c)   Control the secondary host/snail;
Drenching using antihelmintics;
Burning pastures;
Avoid grazing in marshy areas;

(d)   Damaged liver/organs;
Presence of the parasite;
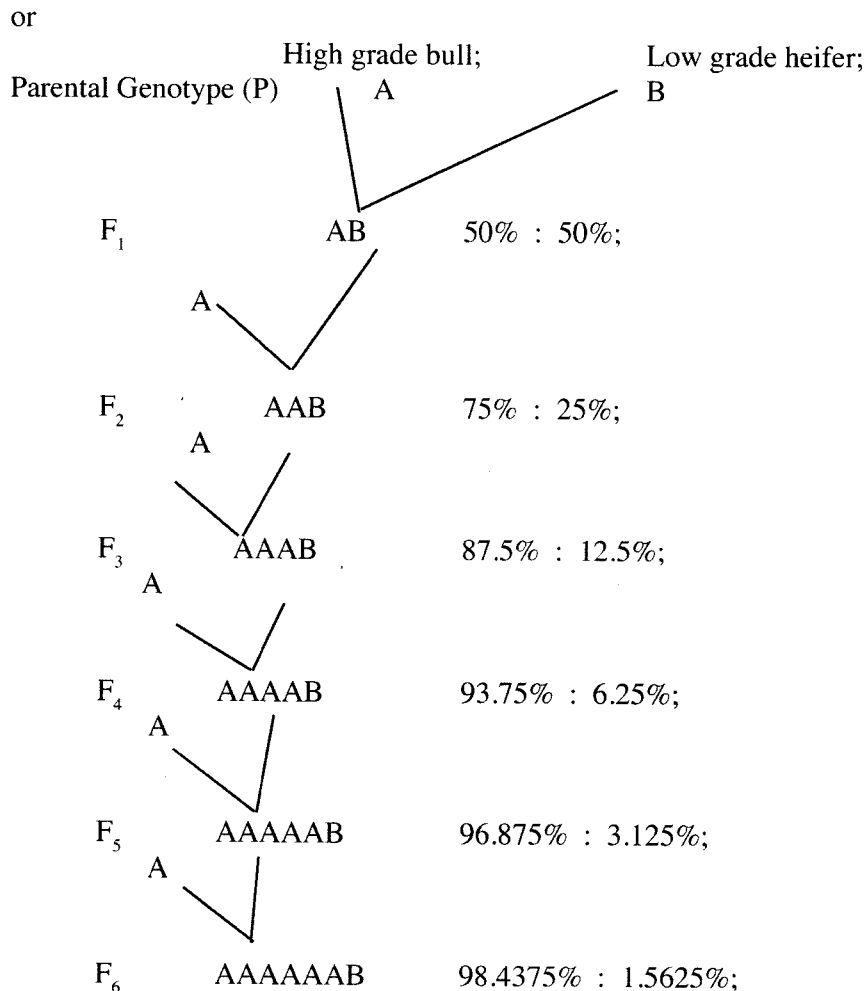Turnels of parasite movements;

Question 19 (a)

(a)   Describe upgrading as a method of improving indigenous cattle for milk production.

(8 marks)

Weaknesses

Many candidates were not able to describe upgrading as a method of breeding in cattle. The syllabus requires the candidates to describe breeding systems.

Expected responses

(a)   Select a high grade pure breed bull; and a well managed low grade heifer;
Mate them to produce a heifer with half of the sire's genes;
Mate the heifer with a sire of the same pure breed as original sire;
Subsequent; heifers should be mated with sires of the same pure breed as original sire;
upto the sixth cross/generation; to produce a hygrade heifer with over 98% genes of the pure breed high grade bull;

or

	High grade bull;		Low grade heifer;
Parental Genotype (P)	A		B
F_1	AB	50% : 50%;	
F_2	AAB	75% : 25%;	
F_3	AAAB	87.5% : 12.5%;	
F_4	AAAAB	93.75% : 6.25%;	
F_5	AAAAAB	96.875% : 3.125%;	
F_6	AAAAAAB	98.4375% : 1.5625%;	

(8 marks)

91

3.8.5 Agriculture Paper 3 (443/3 – PROJECT)·

The agriculture project paper is 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, 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 2014, candidates chose between preparation of compost manure and production of beans or cabbages. The agriculture teacher's duty was to objectively assess and evaluate each candidate's work at all the stages of project implementation. **The assessment by the teacher should be on the basis of the class such that there is an even distribution of scores from the lowest, average and finally the highest performers. Inflating project scores disadvantages the candidates when standardisation is done.**

3.8.6 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.