

THE UNITED REPUBLIC OF TANZANIA INISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY ATIONAL EXAMINATIONS COUNCIL OF TANZANIA



CANDIDATES' ITEMS RESPONSE ANALYSIS REPORT ON THE ADVANCED CERTIFICATE OF SECONDARY EDUCATION EXAMINATION (ACSEE) IN 2022

AGRICULTURE



THE UNITED REPUBLIC OF TANZANIA MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY NATIONAL EXAMINATIONS COUNCIL OF TANZANIA



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134 AGRICULTURE

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FOREWORD

This report analyses candidates' responses to taxamination questions in the 2022 Advanced Certificate of Secondary Education Examination (ACSEE) in Agriculture subject. The report aims at providing feedback to education stakeholders on the performance of the candidates. The ACSEE is a summative evaluation administered at the end of two years of study in the advanced level secondary education.

The general performance of candidates in this year's examination was good. Topics and fields in which candidates had a good performance were Crop Science and Production, Livestock Science and Production, Crop Pests, Pasture Agronomy, Workshop Technology and Farm Structures, Plant Diseases, Farm Power, Farm Mechanization and Machinery and Introduction to Irrigation, Fundamental of International Trade and Farm Planning, Plant Breeding, Environmental and Technological Challenges in Agricultural Development, Soil Science, Introduction to Weed Science, Livestock Reproduction, Breeding and Improvement, Introduction to Animal Health and Introduction to Animal Nutrition. Candidates performed averagely in the topics of Introduction to Agricultural Prices, Introduction to Soil Chemistry and Introduction to Soil Science. However, they had a weak performance in the topic of Agricultural Production Economics.

The good performance was attributed to the candidates' adequate nowledge and skills of the subject matter and the comprehension of the requirements of the questions. On the other hand, the weak performance was attributed to the candidates' inadequate nowledge of the subject matter and the lack of practical skills. The candidates also failed to comprehend the requirements of the questions.

Basically, the analysis will assist in improving the performance of candidates in future examinations, if the recommendations provided are followed. It is the expectation of the Council that all the education stakeholders will take proper measures for improving candidates' performance ACSEE in Agriculture subject.

The Council is quite grateful to examination officers, subject examiners and all people who participated in the preparation of this report.

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Athumani S. Amasi EXECUTIVE SECRETARY

1.0 INTRODUCTION

The Agriculture examination was set according to the 2019 Examination Format based on the 2009 Agriculture Syllabus.

The examination consisted of three papers; 134/1 Agriculture 1 and 134/2 Agriculture 2 being theory papers and 134/3 Agriculture 3, a practical paper. Agriculture 1 and Agriculture 2 consisted of ten questions each. Each question carried 10 marks, making a total of 100 marks in each paper. Agriculture 3 consisted of three questions. Question one carried 20 marks, where the other two questions carried 15 marks each, making a total of 50 marks. Candidates were required to answer all questions in all examination papers.

This year's examination was attempted by 726 candidates from 21 examination centres whereby 725 (100%) passed. This is an increase of 4.84 per cent pass compared to the 2021 results. The examination result of one candidate was withheld. The performance of candidates in the subject has remained to be good in four consecutive years (from 2019 to 2022) despite the fluctuation as shown in Figure 1.



Figure 1: Candidates Performance in Agriculture Subject from 2019 to 2022

Figure 1 illustrates the increase in the performance of candidates in Agriculture subject from 98.49 per cent in 2019 to 98.73 per cent in 2020. The performance dropped to 95.16 per cent in 2021; before rising up to 100 per cent in 2022.

The performance of candidates by grades in the 2022 ACSEE in Agriculture subject is summarised in Table 1.

Table1: Candidates' Performance by Grade in the 2022 ACSEE in Agriculture subject

				Grade	es			%	%	Sat	WITH
Year	Α	B	C	D	Ε	S	F	Pass	Fail		HELD
2021	0	3	34	267	327	57	35	95.16	4.84	724	1
2022	0	24	297	345	58	1	0	100	00	726	1

Source: NECTA Statistics Book, pg 6 ACSEE, 2022

The data in Table 1 show that all candidates who sat for the examination in 2022 passed by scoring from grade B to S. In 2021, 4.84% of the candidates scored grade F. The candidates who score high pass grades increased from 5.38 per cent in 2021 to 44.27 per cent in 2022, while those who score low pass grades decreased from 94.62 per cent in 2021 to 55.73 per cent in 2022.

The next sections of the report present the analysis of the candidates' performance in each question and the analysis of the candidates' performance in each topic and field. Their performances are presented in terms of the percentage of the candidates who passed in a respective question topic or field. The conclusion summarises the report and gave recommendations for improving candidates' performance in future examinations.

2.0 THE ANALYSIS OF THE CANDIDATES' PERFORMANCE IN EACH QUESTION

This section presents the analysis of the candidates' performance in each question. The analysis highlights the requirements of each question, general performance of candidates, candidates' responses and possible reasons for their degree of performance. Extracts representing samples of candidates' correct and incorrect responses and graphics in each question have been included to illustrate specific cases presented. In the analysis, the performance is considered as weak, average or good if the percentage of the candidates' performance ranges between 0-34, 35-59 and 60-100, respectively. The green, yellow, and red colours have been used to denote good, average and weak performance respectively.

2.1 134/1- AGRICULTURE 1

2.1.1 Question 1: Introduction to Soil Science

The question had parts (a) and (b) which required candidates to: (a) explain how soil water is involved in the soil profile development and (b) describe briefly two distinguishing features of each of the master horizon in the soil profile. The question assessed candidates' understanding of the concept of soil profile.

The question was attempted by 726 (100%) candidates of which 260 (36.8%) scored from 0.0 to 3.0 marks, 382 (51.6%) from 3.5 to 5.5 marks and 84 (11.6%) from 6.0 to 8.5 marks. Figure 2 presents the candidates' scores in the question.



Figure 2: Distribution of the Candidates' Scores on Question 1

Figure 2, indicates that 63.2 per cent of the candidates scored from 3.5 to 8.5 marks and 36.8 per cent from 0.0 to 3.0 marks. The data show that the candidates' performance in the question was good.

The candidates who performed well (11.6%) in this question, succeeded to explain how water is involved in the soil profile development by providing

response such as: soil water as a transport agent help in the movement of materials up and down the soil in part (a). In part (b), most of them provided correct features of each horizon in the soil profile such as the presence of large amount of organic matter in horizon "O" (organic horizon), a layer of minerals with most organic matter accumulation in horizon "A" (eluviation), horizon "E" (eluviation) is rich in nutrients that are leached from "A" and "O" horizons, contains a high concentration of silicate, clay, iron, aluminium and carbonates, horizon "B" (illuviation), is poorly weathered or unweathered, horizon "C" and is a bed rock horizon which is compacted and cemented by the weight of overlying horizons, horizon "R". This implies that the candidates had a good understanding of the concept of soil profile. Extract 1.1 presents a sample of responses from a candidate who had a good performance in the question.

<u> </u>		
1	(a) foil is construct in toil popula development	
	Through LEACHING PROCESS from horizon A to B	
	· Leasting is the treating away of plant nutri	
	ents and Minerals down the soil. This Leave	
	luía laure accumulation of refrients in hori	
	zon B.	
	(b) , "O" hanizon	
	- Have high organic states (humus)	
	- It has daste brown Colour due to the	
	preserve of high humas	
	ij "A" honzon	
	- Have high organic katter	
	- It is called elluviated because heading	
	oncur to wash down the profile the outrient	
	-It has high plant nutrients.	
	- It is dank in colour.	
	in "B" hon'zon	
	- It has low organic realter content	
	-It is called horizon of accumulation of	
	Materials from honizon "O" and "A"	
	10 "C" horizon	
	- contain un consolizated 152Ks	
	- No or little weather has occured.	
	b" b" honzon. (Bed Dock).	
	- contain Consolidated Porki	
	- No weathering process has orcent	

Extract 1.1: A sample of the correct responses on question 1

In Extract 1.1, the candidate provided correct responses in part (a) but failed to explain horizon E and one feature of horizon B in part (b). This signifies the possession of adequate knowledge of the soil profile.

Further, the analysis shows that most candidates who performed averagely (51.6%), provided the correct response on how water is involved in the soil profile development in part (a). In part (b), they provided partial correct

responses given that they only analysed some horizons of the soil profile without exhausting and describing their distinguishing features. Some candidates mixed up the distinguishing features of horizons 'A' with 'B', hence, most of them did not analyse horizon 'E'. The candidates exhibited the possession of partial knowledge of the soil profile.

However, the majority of the candidates who had a weak performance (36.8%)responded incorrectly in almost all parts of the question. In part (a), such candidates did not understand the requirement of the question. Thus, they gave the importance of water in the soil instead of explaining how it is involved in the formation of the soil profile. Responses given were such as: *cool the soil*, raw material for photosynthesis and dissolve mineral salt. Likewise, some candidates defined the term soil profile and others distinguished the soil water from the soil profile contrary to the requirement of the question. In part (b), the candidates were unable to describe the distinguishing features of the horizons in the soil profile. They generalised features to all horizons. Examples of the incorrect responses provided were: it contain plant and animal, it contain water, it contain small pore space, it contain fertile soil, it contain microorganisms as a features for horizons "O", "A", "B", "C" and "R". In addition, some candidates confused the distinctive features of horizon "A" with horizon "B". This is because they confused the terms eluviation and illuviation. The responses provided proved that the candidates had a poor mastery of the subject matter. Extract 1.2 is a sample of the incorrect responses from a candidate who had a weak performance in the question.

= Since soil	protile is ventrical crossation of soil. Now
col water	enter in different horizon to shimulde
receptopment	of soil profile through molituring and
hydrolyzing	them.
D DIAGR	AM OF HORIZON IN A LOLL PROFILE.
	Parent materal
	or of the second
	Himzen D
	thanzen (
×	
	ttonzon B
	Horzon A

Extract 1.2: A sample of the incorrect responses on question 1

In Extract 1.2, the candidate failed to provide correct responses in all parts of the question. For example, in part (b), he/she drew a diagram of the soil profile instead of giving the distinctive features of the horizons of the soil profile.

2.1.2 Question 2: Introduction to Soil Science

The question comprised parts (a) and (b). Candidates were required to: (a) briefly describe four soil structural grades and (b) categorise soil structure types on the basis of the shape and arrangement of peds. The question examined candidates' knowledge of soil structure.

The question was attempted by 726 (100%) candidates, whereby 476 (65.6%) scored from 0.0 to 3.0 marks, 156 (21.5%) from 3.5 to 5.5 marks and 94 (12.9%) from 6.0 to 8.0 marks. Figure 3 represents the candidates' scores in the question.



Figure 3: Distribution of the Candidates' Scores on Question 2

Figure 3, shows that 34.4% per cent of the candidates scored from 3.5 to 8.0 marks whereas 65.6 per cent scored from 0.0 to 3.0 marks. These data indicate that the candidates' performance in the question was average.

Data analysis shows that 12.9 per cent of the candidates had a good performance in the question. Most of the candidates managed to explain the soil structural grades by giving responses such as; 0.structureless, 1.weak, 2. moderate and 3.strong in part (a). Moreover, in part (b), they were able to categorize the soil structure types based on the shape and arrangement of peds such as plate-like, prism-like, block-like and sphere like. The responses signify that the candidates were knowledgeable of the soil structure. Extract 2.1 presents a sample of relatively correct responses in the question.

a) 10 explain four soil stractural grubes Siell structure is the arrangement of 2 individual particle in the soil where the soil micture grade show the formation of aggregate in the soil. Sol structure grades 1) O-structure -4 the soil occur with no coorenable regaregates this called 6-structure 11 Weak The soil have poor aggregate Form pel·inthe with 111 Moderabe gates that form well sell shull 10/ strong > The soil show quite evident of stron aggregater which cannote and b) Categories of soil structure type 1) plate like structure - The soil is more developed horizon fally than vertically flat form plate like soil

the plate like soil have been type used platy - with thick un laminar - with thin up 2 6 curred I'mina Laminan platette Presen Nh tructure imore developed vertically which form Al in telle of two ty rec Conre form edge hun Grander flat chase Angular form ere like miture 11) doe not develop hororental no vertical but show the various shape type Primatic Sub angular like Anoture 10 - Thereit show all three domen given are equal.

Extract 2.1: A sample of the relatively correct responses on question 2

In Extract 2.1, the candidate correctly attempted the question in both parts. The exception is in pat (b) where he/she did not give the correct explanation of the sphere-like soil structure type.

The candidates who had an average performance were 21.5 per cent. Most of them correctly categorised the soil structural types in part (b). In part (a), some of them were able to name the soil structural grades without giving an explanation. Others explained the soil capability classes instead of the soil structural grades. This implies that the candidates had an inadequate knowledge of the soil structure.

On the other hand, 65.6 per cent of the candidates had a weak performance. Most of them failed to provide correct responses in both parts of the question. In part (a), some of them explained the types of soil texture like *clay soil, loam soil, silt soil* and *sand soil* instead of the soil structural grades. Moreover, others described the horizons of the soil profile such as "O" horizon, "A" horizon, "B" horizon and "C" horizon. Other incorrect responses provided focused on the stages of the soil formation like *matured soil, unmatured soil, young soil* and *old soil*. In part (b), the candidates failed to categorize the soil structure types. Some of the incorrect responses provided were; *are small in size, it is cylindrical in shape, they are large in shape, it is medium in size* and *granulation*. The responses did not relate to the requirement of the question the fact which indicates the lack of knowledge of soil structure. Extract 2.2 is a sample of the incorrect responses in the question.

Extract 2.2: A sample of the incorrect responses on question 2

In Extract 2.2, the candidate provided incorrect responses in both parts. In part (a) the candidate named the stages of the soil formation instead of explaining the soil structural grades. Likewise, in part (b), the candidate named the types of soil particles and soil texture instead of categorising the types of soil structure.

2.1.3 Question 3: Introduction to Soil Chemistry

In this question the candidates were required to analyse five factors that influence the nutritional value and quality of farm yard manure. The question tested candidates' understanding of the concept of farm-yard manure.

The question was attempted by 726 (100%) candidates whereas 469 (64.6%) scored from 0.0 to 3.0 marks, 127 (17.5%) from 3.5 to 5.5 marks and 130 (17.9%) from 6.0 to 10 marks. Figure 4 portrays the candidates' scores in the question.



Figure 4: Distribution of the Candidates' Scores on Question 3

Figure 4 denotes that 35.4 per cent of the candidates scored from 3.5 to 10 marks while 64.6 per cent from 0.0 to 3.0 marks. The general performance of the candidates in the question was average.

The analysis revealed that, 17.9 per cent of the candidates did well in the question. Most of them correctly analysed the factors which influence the nutritional value and the quality of farmyard manure. The responses provided include type of animal from which the manure is made, the quality of the feed given to the animal, the type of bedding materials/litter used, the method of manure handling and storage and age of the animal. This demonstrates that the candidates were conversant with the subject matter. Extract 3.1 presents the correct responses from one of the candidates.

0	The the barrier was a lite of a lite	· · · ·
3	yactors you influence The numbered value	
	and quality of tarm land manue are	
	Of the kind of animal organism	
	different animals exercise or produce farm lead	
	manue which is detered in nutritive and quality.	
	small animale such as porting produce more number	
	fam used manue than large organizer such as	
	Cattle ,	
	The duality a feed anieu & animal.	
	the party freed while anti lage	
	the animal gives pary auch cordam unge	
	number of numpre value shey produce praim	
<u> </u>	yourd manure which is more nutritive than the	
	animal feed with low nutrouts. Example animal	
	given with legumes produce nutritive tany yeard	
	manue than feeding glasser.	
	(it) Types of litter lef,	
	The farm yard manue produced from the	
	letter which are permable to untre and	
	une and prodece much numporal value	
	and quality than that produced from inno	
	rmeable litter, porneable litters are such as straws	
	a marie '	
	0	
	(W) Netwood of Sprage of Lame word manup.	
	The proper Aread theme want manual holows	
	abit a number to best any stars and make	
	and of many land being a much of the second of	
<u> </u>	of miners nearce alleraces of mumau on pair your	
	monue	
g	is The Age of the animal.	
	- The advect arring or organism excrete have ces	
	which contain largest amoust of nutrend than younger	
	Ogan(Im ·	

Extract 3.1: A sample of the correct responses on question 3

In Extract 3.1, the candidate responded correctly in the question, signifying good mastery of the subject matter.

Data analysis showed that 17.5 per cent of the candidates performed averagely in the question. Most of them did not come up with all factors required. Despite that some candidates provided the correct factors, they failed to explain them fully. This implies that they were partially knowledgeable of the subject matter.

Further analysis reveals that 64.6 per cent of the candidates had a weak performance. The majority of them failed to provide correct responses in the question. Examples of the incorrect responses given were *through* application of holes, amount of manure applied to the soil, agronomic practices, presence of humidity, size and shape of the manure and reaction of the soil pH as factors influencing the nutritional value and quality of farm yard manure. This justifies that the candidates lacked knowledge of the farmyard manure. Furthermore, some of them provided the importance of farm yard manure such as; *farmyard manure contains some nutrients* elements for plant growth, it influence water retention to the soil and it enhance good soil aeration instead of the factors required. These candidates did not understand the requirement of the question. Examples of the incorrect responses in the question are presented in Extract 3.2.

3 (2) Decomposable organic materials. There are some	
materials which when they bend to decomposes it	
increases the nutrition value of the farm- yard	
manure hence tends to micrease the quality and	
quantity of agricultural produces when a certain	
form-yard manure used during planting.	
(b) Heap moisture; Moisture in the farm - yard	
manure should be optimum to tayour the various	
activities within the manure to takes place in	
order to increase the nutitional value and	
audite of farm-yard manure.	
(c) Acration: the exchanges of gaves in the farm.	
Yard manure should be parourable for the nuce.	
organisms used in the decomposition & organic	
matter to work expiciently	
(2) Amount of manure and askes added during decomposi	
tion: The manures are added during farm - yard	
manure preparation in order to autivate the micro-	
oragonium to function well but also may out on	
a stanter of the microachivities in the decomposing	
organic matter and ashes maintain the pH of materials.	
(B) Temperature ; High temperature may assert the	
mitro-organism activities to function well and low	
temperature may dearlivate the micro-organism so	
that optimum temperature is required for the	
micro-organism to junction well but also to	
reduce the loss of moisture in the form-yard manue	
9	

Extract 3.2: A sample of the incorrect responses on question 3

In Extract.3.2, the candidate provided responses that were not related to the requirement of the question.

2.1.4 Question 4: Introduction to Soil Chemistry

The question consisted of parts (a) and (b). Candidates were required to: (a) give two points on what would happen if inorganic fertilizers are stored in an open space and subjected to the sunlight and (b) briefly explain why farmers should consider the following aspects to ensure efficient proper use of fertilizer by giving one example in each case (i) right fertilizer type (ii) right fertilizer rate (iii) right time of fertilizer application and (iv) right method of fertilizer application. The question tested candidates' knowledge and skills of the storage and use of inorganic fertilizers.

The question was attempted by 726 (100%) candidates, out of which 260 (35.8%) scored from 0.0 to 3.0 marks, 360 (49.6%) from 3.5 to 5.5 marks and 106 (14.6%) from 6.0 to 10 marks. Figure 5 summarizes the candidates' scores in the question.



Figure 5: Distribution of the Candidates' Scores on Question 4.

With respect to Figure 5, the analysis show that 64.2 per cent of the candidates scored from 3.5 to 10 marks where 35.8 per cent from 0.0 to 3.0 marks. The data generally indicate a good performance of the candidates.

The candidates who performed well in the question were 14.6 per cent. Most of them correctly attempted both parts of the question. In part (a), they were able to point out that fertilizer bags can absorb moisture from the atmosphere or floor and when exposed to the sunlight, resulting into loss of nutrients through volatization. Similarly, in part (b) they managed to explain the proper use of fertilizer and give one example of each case with regard to the right fertilizer type, right fertilizer rate, right time of fertilizer application and right method of fertilizer application. This shows they were knowledgeable and skilled in the storage and use of inorganic fertilizers. Extract 4.1 illustrates a sample of the correct responses in the question.

04, @ When Inorganic fertilizers & stored in a	
open spare and subjected to symplight.	
(i) It will will beginne dry and use it's motif	
me notice which will were it to love it	1
butitus not a i	()
(in Ac about to an striver also about	
(1) HS append to all 11 an and here (alust	
moising from the advice prove and found solar	
h which ted is granny to according may	£ -
113 application to be hardi	
	+
(b) (i) in churching of night type of territor	+
= 27 6 Important so as to use the right tyle of	
Leithizer which contain the numerit required for	+
the specific attinty required to take place to the	
crop dant in the farm,	N -
Example In need of growth of Crops there is need	*
of application of Minigeneous petrificar like	
NPK so as to faulitate & Vagetative growth	
and food production,	C. L-
(ii) In wing of night rate of pertiliser,	
- The nght rate of fertilizer should be applies	₽
So as to satisfy the requirement of plant and	
the application should be as recommended.	
Too much use of the fertilizer can led to	
after problem to plant.	
Example: Too much application of notrogenou	
Pertirey led to too much regetative growth	
which result to the plant to delay maturity	j
and being suspectable to diseases,	

fertilizer application. Dai time of In case of right the Levil inor alle time 8 applica (midered Condition 40 0000 50 as gone the 1 ause ner to absort a 0 applica how 1. mour 200 to fai 0 mil Nec and 0 (an led use aA chowld a orablem scorchina like diseases a to Siammoniam polica ramp tion toos drestin Chorphate 100 120N 5 Used 11 D name effect socause DOOT after an planting nas 0000 the exan round 00 emerconce 0 ato (K na non 1 50 as 011 Considered 0 the the trom abin nutrient 01 more 2 icient 200/120 a nethod netho Re whong as to ed POOV 170× e terti d SIR 205 to no elle dv to e oi and 5 to have effect loaro the 40 14 e applied broad fo casti reed al or bp G netherd Conneler DAP Dammoniam popration of FXamo O hotr svaalcast m ho 8 the to the placement longar Small effer

Extract 4.1: A sample of the correct responses on question 4

In Extract 4.1, the candidate has provided correct responses to all parts of the question.

The question had 49.6 per cent of the candidates who performed averagely. The majority of them responded correctly by giving an explanation of what would happen when storing inorganic fertilizers in the open space and is subjected to the sun light in part (a). In part (b), they responded correct by explaining proper use of fertilizer regarding right fertilizer rate and right time of fertilizer application in item (ii) and (iii), respectively. They failed to explain the proper use of fertilizer, factor to consider when choosing the right fertilizer type and right method of fertilizer application in item (i) and (iv), respectively. This is an indication of partial understanding of the use of inorganic fertilizers.

Nevertheless, 35.8 per cent of the candidates performed poorly in the question. Such candidates responded incorrectly in nearly all parts of the question. Some of them wrote irrelevant things about fertilizer. For example, in part (a), they failed to give the correct explanation as to what would happen upon storing inorganic fertilizers in the open space and subject it to the sunlight. Some of the incorrect responses were; it leads to leaching, it causes environmental pollution, fertilizer may be blown with wind, children may take and swallow it, can cause death and oxidation-reduction may take place. In part (b), they also failed to explain the proper use of the fertilizer with regard to the named factors. Example of the incorrect responses given were; (i) right fertilizer type- foliar application example nitrogen, young plants absorbs fertilizer efficiency for growth, improve microbial activities (ii) right fertilizer rate- fertilizer have higher rate of functions while others have low rate, it help efficient of fertilizer (iii) right time of fertilizer application-during day the fertilizer loose the nutrients through evaporation, early in the morning and evening to avoid evaporation, and after harvesting and (iv) right method of fertilizer application-it help farmer to work at proper time, to determine labour requirement, it prevent soil pollution and it *control soil erosion.* The responses given by the candidates signify the lack of knowledge of the storage and use of inorganic fertilizers. Extract 4.2 is a representative sample of the incorrect responses in the question.

Gai It release it is nutrient quickly	
is it increase the sort acidity	
Abri Sulphate of ammonia	
i lkg.	
is Early in the Morning	

Extract 4.2: A sample of the incorrect responses on question 4

In Extract 4.2, the candidate provided incorrect responses in both parts of the question. For example, in part (b), despite of the incorrect responses provided, the candidate failed to understand the requirements of the question.

2.1.5 Question 5: Farm Power

The question consisted of parts (a) and (b). Candidates were required to: (a) suggest five conditions suitable for the successful implementation of the plan in which the school is planning to use animals as a source of power instead of the farm tractor due to economic constraints and (b) examine five important animal management practices to be adopted in order to obtain a maximum output from the animal farm power. The question required candidates to be knowledgeable of the sources of farm power.

The question was attempted by 726 (100%) candidates, whereas 84 (11.6%) scored from 0.0 to 3.0 marks, 285 (39.2%) from 3.5 to 5.5 and 357 (49.2%) from 6.0 to 10 marks. Figure 6 indicates the candidates' scores in the question.



Figure 6: Distribution of the Candidates' Scores on Question 5

According to Figure 6, the majority of the candidates (88.4%) scored from 3.5 to 10 marks and 11.6 per cent from 0.0 to 5.0 marks. Thus, the general performance of the candidates in the question was good.

The candidates with a good performance in the question were 49.2 per cent. Most of them had both parts of the question correctly attempted. In part (a), they were able to suggest the conditions for a successful use of the animal power such as the vegetation should be relatively short and light, animal diseases and parasites must be controlled, the land should be reasonably levelled with light soils and farmer in a particular area must have animals as part of their farming business. Moreover, in part (b), they correctly examined the animal management practices to be adopted in order to obtain a maximum output from the animal farm power. Examples of the responses given were; working animals must be given feed supplements and minerals, working animals must be well fed on rich pasture grass or hay, green fodder and other recommended feeds, working animals must be protected from diseases and parasites and working animals must be checked for injuries every day. This indicates that the candidates had a good mastery of animals as the source of farm power. Extract 5.1 is an example of the correct responses in the question.

F(a)	undition for success but implementation	
0	of the plan	
i	Is There should be animal laptin	
	silial that will to provide over.	
QI	The land Should be resimably flat.	
iiv	Animal Parisite and disease shall	
	be arcontrolled not agreat problem	
12	There should be shalled personel for	
	truining animal for working in	
	farmi	1
V	There shared be the area for grazing	
	animal suthat they get feed	5
I		2002

		250 cm
5(6)	Important animal management practice to	
	be a depted to obtain maximim autput from	
	animal puer.	
	' Animal shall be given enough	
	Jeed with high proposition of carbohyd	-
	rate flat utill pride energy	
	12 Drimal paralite and dirage Sho	
	uld be controlled in order to mountain	
	I the health of animal for	
	working properly	
	Till Animal shueld be given an ample	
	time to rest after Job softiat	
	can generate energy for another	
	time.	
	W Animal charles be given Suplementar	
	feed was to inscare projectivity of	
	He going	
	VI Anional Charles he arres with a	1100.0
	Plante of write because writer	
	pully of white colling of an include	
	nerpin arganico, caring of anima,	
	budy and in exercicen kend animal	
	Shalld be given a water,	
	· · ·	

Extract 5.1: A sample of the correct responses on question 5

In Extract 5:1, the candidate responded correctly in both parts of the question, showing a good understanding of the animal farm power.

The analysis shows that 39.2 per cent of the candidates had an average performance in the question. Generally, the candidates correctly examined the important animal management practices to be employed in order to obtain their maximum output as the source of farm power in part (b). This suggests that they were familiar with the important considerations when using animals as the source of the farm power. In part (a), most of them gave the advantages of using animals over the farm tractor as source of the farm power instead of the conditions suitable for a successful use of animals other than the farm tractor. The candidates in this case failed to fulfil the requirement of the question.

Nonetheless, 11.6 per cent of the candidates performed poorly in the question. In part (a), most of them suggested the desirable qualities of an oxen to be used as a drought animal instead of the conditions suitable for a successful use of animals as the source of the farm power. Their responses included: *should be at the age of 2-3 years, should be castrated, should have a hump against which a yoke can rest, should have short horns* and *should be of quite temperament*. This indicates the failure to meet the requirement of the question. Likewise, in part (b), they failed to examine the important animal management practices to be adopted to obtain a maximum output. Examples of the incorrect responses were; *dehorning, castration* and *identification*. Some candidates mentioned the types of drought animals such as *oxen, donkey* and *camels*. This proves that the candidates had a poor understanding of the animal as the source of the farm power. Extract 5:2 is an example of the incorrect responses from a candidate who had a weak performance in the question.

5	of condition for successful implementation	
	of the plan is	
	& There must be enough land solted	
	tractor can work properly in the	
	(um'	
	1	
	is There must be sparr and services	
	a that during repair and maintenance.	
	spair made availables	
	111/ There must be skilled people.	
	Truchy need trained person so that	
	can operate properly in the	
	fam so that incase when the	
	fructor fuil to openute the driver	
	can know what is the public.	
	N/ There must be enough	
	Capitul especially during	
	Purchasing, material needed by	
_	The truck during furming	
	opention example oil w Free!	
	V The returns from the firm shade	
	Justity the cost of running (+8)	
L	the pructiv.	
	My climate & the area amale	
	W weather conditions should be	
	conducive by warking trucker	
5	by Management ore.	
	Pr extending time in the furning	
	Operation	
	· · · · · · · · · · · · · · · · · · ·	
	Il ineveasing working hour m	
	The fame	

1/ Mechamping the From 60 lut	
to ensure easy operation of	
animal power-	
 y Minimize the intesty of	
 work it pussible,"	

Extract 5.2: A sample of the incorrect responses on question 5

In Extract 5.2, the candidate provided incorrect responses in both parts of the question. In part (a), he/she suggested conditions for using the tractor instead of animals as the source of the farm power. In part (b), the candidate provided responses that were not asked by the question.

2.1.6 Question 6: Farm Structures and Workshop Technology

The question consisted of parts (a) and (b). Candidates were required to: (a) give six points on how the maintenance of the dip is carried out in order to guarantee its efficiency and last longer and (b) justify in four points that a farm without a workshop is said to be incomplete. The question tested candidates' knowledge of the farm structures.

The question was attempted by 726 (100%) candidates, of which 34 (4.7%) scored from 0.0 to 3.0 marks, 171 (23.5%) from 3.5 to 5.5 marks and 521 (71.8%) from 6.0 to 10 marks. Figure 7 shows the candidates' scores in the question.



Figure 7: Distribution of the Candidates' Scores on Question 6

Referring to Figure 7, the majority of the candidates (95.3%) scored from 3.5 to 10 marks, whereby 4.7 per cent from 0.0 to 3.0 marks. The general performance of the candidates in the question was good.

Data analysis indicated that 71.8 per cent of the candidates performed well in both parts of the question. In part (a), they gave correct responses on the maintenance practices of the dip and correctly justified the importance of the farm workshop. The candidates proved to have a good understanding of the maintenance of the dip and the importance of the farm workshop. Extract 6.1 is a vivid example of the correct responses in the question.

a7	MAINTENANCE OF DIPJ:-
- 17	> Regular changing or replacing the dip wash from
	the dip tank to prevent injection transmission to the
_	animals
ii	> Replacing the Copper Sulphale (CUSO4) in the fool
	bath that has been excessively used by the
	animals in the dip-to maintain the efficiency of
1	the activity

607	iii Repairing any cracks, or creviles in the draining	
	race to sayequard animals at the dip away from	
	unnetessary injuries.	
	ive Contruction and in care cardie of the translation	
	contraction and in case repair of the aip sheller (roof)	
	to prevent excess ditution of the dip.	
_	v> Removal of the Sediments from the Soaking pit	-
	to prevent transper of pathogens to animals.	
	viz Adjust the number of animals to correct number of	
	those entering the collecting word so as to	
	prevent desormation of the dip structure.	
	province j p on the second	
615	NECENTRY DE WORKINDP'	
0.01	In the hole is making inde	
	L' Farm work mop neups in making simple farm	
	tools and equipment that are espential for use	
	in farm activities.	
	is farm workshop ensures the continuity of	
	production as tools, machinery and implements are	
	made available for use on the farm.	
	V	
	iii) Farm workshop prolongs the life of machinery,	
	tools and implements that can be used for a	
	Vasiety of case persons	··· ·
	the form market - any that halks attaction -	-
	in the territory activities are	
	simplified due to presence of proper tools thus giving	
	the farmer an ample time to perform other	
	production activities like animal keeping on the farm.	

Extract 6.1: A sample of the correct responses on question 6

In Extract 6.1, the candidate showed a good mastery of the subject matter hence provided correct responses in both parts of the question.

Furthermore, it was noted in the analysis that 23.5 per cent of the candidates had an average performance. Mostly, they managed to justify the importance of the farm workshop in part (b). In part (a), they failed to exhaust all the required maintenance practices of the dip. For example, some of the incorrect responses they gave included: *change of chemical, use of correct concentration of active ingredient and regular dipping of animals*. The candidates demonstrated partial knowledge of the maintenance of the dip.

Conversely, 4.7 per cent of the candidates had a weak performance in the question. In general, they responded incorrectly in the whole question. In part (a), they were unable to give the maintenance practices of the dip. Most of their responses were the precautions to be taken when using the dip contrary to the requirement of the question. Some of the incorrect responses provided include: do not enter more animal at once in a dip, put enough water and feed in a collecting yard, do not allow pregnant and sick animals in a dip and small animals should not be allowed in a dip. In part (b), they failed to justify the importance of the farm workshop. For example, some of the candidates outlined the importance of the store such as used for storage of inputs such as seeds, fertilizers and chemicals used in farm and it help in storage of farm produce after harvesting instead of the importance of the farm workshop. Other incorrect responses were; used for carrying out activities such as mixing of fertilizers and milking of cows and it helps a farmer to secure the farm. This implies that the candidates were not conversant with the maintenance of the dip and importance of the farm workshop. Examples of the incorrect responses in the question are shown in Extract 6.2.

6 b) increased the cost of incurred repair and	
Mamfairance. A famer without work thop	
(ii failed became incomplete because there is increased	
in Costo Colt of repair and maintainance,	
(iii) Failed to ensure the antinuous forming	
operation in repair is quickly as timer	-
(the failed to form structure	
(iii) fall in the work of Orpenby Lecause if need	
workeship tool.	
(in Decreate the time	
(in for the time economy in relation & operation	
during Varying Season.	
0 0	
Goij The dead dip sherild to removed	
in The dip must be filled with water	
Til The near to the sormer water for early	
. to get water.	
	1

Extract 6.2: A sample of the incorrect responses on question 6

In Extract 6.2, the candidate attempted both parts of the question incorrectly by giving responses that did not meet the requirement of the question.

2.1.7 Question 7: Introduction to Irrigation and Farm Mechanization and Machinery

The question comprised parts (a) and (b). Candidates were required to: (a) give five advantages of the overhead irrigation over the surface irrigation and (b) briefly explain in five points the prerequisite conditions for using the disc plough over the mouldboard plough. The question examined candidates' understanding of methods of irrigation and farm implements.

The question was attempted by 726 (100%) candidates whereby 94 (12.9%) scored from 0.0 to 3.0 marks, 298 (41.1%) from 3.5 to 5.5 marks and 334 (46%) from 6.0 to 9.5 marks. Figure 8 denotes the candidates' scores in the question.


Figure 8: Distributions of the Candidates Scores on Question 7

Figure 8 indicates that, the majority of the candidates (87.1%) scored from 3.5 to 9.5 marks, while 12.9 per cent from 0.0 to 3.0 marks. The general performance of the candidates in the question was good.

The analysis of the results shows that 46 per cent of the candidates had a good performance in the question. To a greater extent, they managed to provide correct responses in both parts of the question. They gave correct advantages of the overhead irrigation over the surface irrigation in part (a) including *soil erosion is minimized, it can be used on sloping areas or flat areas, no special skills is required to operate this system* and *it minimizes wastage of water*. In part (b), they responded well on the prerequisite conditions for using the disc plough over the mouldboard plough. Responses given were such as *the soil was heavy and sticky, the soil was hard and dry, the land had hidden objects (rocks, roots of trees, stumps) and soil surface was covered with fresh and thick vegetation*. The candidates demonstrated the possession of adequate knowledge of the methods of irrigation and use of farm implements. Extract 7.1 exemplifies a sample of the correct responses in the question.

7(0)	A-trantago of overhead imigation over surger	
	imgapion.	
	is overhead imaghion it cites small amount of water	
	compare to surface ingohon, hence using orerhead	
	imigation its cost loss costly interms of water:	
	i) overhaar imigation ensure that large area can be	
	Imageted through using small number of bour	
	compair to the kurtano inigopop hence it lab	
	our saving mathends.	
	m) in overhead imigation sail enorion is high cont	
	relied compare the the surface ingotion as the	
	deers not involve the downward movement of	
	water compare to the surface imigation.	

7	in) it can be clone to the any topography and	<u>```</u>
	any kind of said type but augaes imaginen 14	
	dependent in topography and sort type,	
	v) in exchand incaper the incaper water on	
	be done mixed too that with conflicer through the	
	woone of leobaphin but center introdop closerat	P.
	preess of printing been surged ingene dates	
	· · · · ·	
7 02	Advantage of Dric plaugh over maulthand plaugh.	
10	A lo hand coil first alough planch abaching plantime	
	the mould have along heraus alia: along the	
	Man mount verreg process because crise program	
	the the cert in noting in sect.	
	(1) Kough and stone soil which the mould board plough	
	an not overcome obstacles than the clic pleugh.	-
	in Mould and Least pearly soil, which the fundar since of	
	mould board phough can't pot turn early than the	
	fumou die of the dise places .	
	IN in the soil with sty shick and having hard parn.	
	- Mouldboard plough can not work oin soil with the	
	stick character hence disc plaugh it required.	
	v) to soil with extensive root ortem.	0.
	- Mould bourd plaugh an of work is the area with	
	highly not bostonice actions but rather counted to	
	would with drie plump since they an notat of as they	
	and the fumul cline.	
	the forest forest	
		<u> </u>

Extract 7.1: A sample of the correct responses on question 7

In Extract 7.1, the candidate responded correctly in both parts of the question except for part (b) where he/she provided partially correct response in one point.

The candidates who performed averagely in the question were 41.1 per cent. It was observed that, such candidates did not exhaust all points in both parts. This indicates that they had partial understanding of the methods of irrigation and soil conditions for the use of the disc plough.

On the other hand, 12.5 per cent of the candidates did poorly in the question. Most of them gave incorrect responses in almost all parts of the question. In part (a), they failed to give the advantages of the overhead irrigation over the surface irrigation. Their incorrect responses included *it is less expensive, it prevents spread of fungal diseases, cause water lodging to crop plants, overhead irrigation it cause soil erosion* and *the water applied is safe*. Moreover, they also failed to explain the prerequisite conditions for the use of the disc plough over the mouldboard plough in part (b). Examples of the incorrect responses given were; *is used to cultivate on slope or flat soil, it require less skills, the land is not hard and not compacted, less maintenance compared to mouldboard ploughs, it have ability to work in wet condition and it requires a large size of land. This signifies that the candidates lacked knowledge of the methods of irrigation and use of farm implements. Extract 7.2 illustrates a sample of the incorrect responses in the question.*

7(0)	Advantage of averhead impation.	
_		
	(1) are theat impation aids in supplying	
	sufficient moliture to the crops	-
	(1) Overhead Irrigation discourse the occurance	
	of allease to the plants	
	(11) Overhead longation it 11 not expensive	
	(1) overhead imgation donot require more	
	daills and knowledge	
	(V) Overhead Irrigation	
76)	(1) Disc plaugh can be used in the areas where	North Control In
	mould for board plough cannot work	
	(1) Disc plough we sult into doeper penetration	

7(6)	(iii)	Disc plough it works more efficiently than	
		mould braid plough	
	3	Disc plaugh tends to improves the soil	
		Stuchues	
	(v)	Disc plaughs find to efficiently than	
		Marild board	1112

Extract 7.2: A sample of the incorrect responses on question 7

In Extract 7.2, the candidate showed a poor understanding of the irrigation methods and use of the farm implements by responding incorrectly in both parts of the question.

2.1.8 Question 8: Agricultural Production Economics

The question was divided into parts (a), (b) and (c). Candidates were required to: (a) briefly explain three ways in which inputs used in production process relate with quantity of yield produced (b) name the region of the production function in which the following situation operates and give reason: the school is keeping a few poultry in a very large poultry house and (c) name the region of production function in which the following situation operate and give reason: the school cattle are overgrazed in the school pasture. The question tested candidates' understanding of the concept of production function.

The question was attempted by 726 (100%) candidates, of which 547 (75.3%) scored from 0.0 to 3.0 marks, 148 (20.4%) from 3.5 to 5.5 marks and 31 (4.3%) from 6.0 to 8.5 marks. Figure 9 indicates the candidates' scores in the question.



Figure 9: Distribution of the Candidates' Scores on Question 8

Figure 9 shows that 24.7 per cent of the candidates scored from 3.5 to 8.5 marks, whereas 75.3 per cent from 0.0 to 3.0 marks. The performance of the candidates in the question was generally weak.

The statistical analysis denotes that 75.3 per cent of the candidates performed poorly in the question. The majority of them failed to provide correct responses in almost all parts of the question. The candidates were unable to explain ways in which inputs used in production process relates with the quantity of yield in part (a). They pointed out the main questions to be answered in making production decisions such as; What to produce? How to produce? How much to produce? and Where to buy (inputs) and sell (output)?. The correct relationships were increasing return production function, decreasing return production function and constant return production function. Some of them explained the relationship between input and input, input and output and output and output as factor-factor relationship, factor-product relationship, and product-product relationship. Other incorrect responses provided were; addition of fertilizer, use of herbicides and pesticides, provision of balanced diet, provision of inputs like poultry feeds and estimating quality of production. In part (b), the candidates failed to name and explain the region of production function in a situation where a few broilers are kept in a very large poultry house. Some of them named the regions of Tanzania such as Shinyanga, Arusha, Kagera, Kilimanjaro, Tabora and Singida. Others named the productproduct relationship such as; joint product, competitive product, supplementary products and complementary products. The correct production function region

in which the stated situation relates is region (zone) I, where there is the underutilization of inputs. Similarly, in part (c) they failed to name and explain the production function region in a situation where the cattle are overgrazed in the pasture. As it was in part (b), some of the candidates mentioned the regions of Tanzania. Other incorrect responses given were such as *zero grazing, high yield pasture, dairy cattle, increasing return* and *marginal product is equal to average products*. The correct production function region in which the stated situation relates is region (zone) III, where there is excessive use of inputs. This indicates the lack of knowledge of the concept of production function. Extract 8.1 depicts a sample of the incorrect responses in the question.

8a. Lelationship petween Input Used and Quantity produced.	
(i) Fixed rate upstitution of imput.	
- The set the way on which the smout requer of it at	
Fixed amount pupp when the imout to realize the	
Econole: Only 10 deallos mut be confueld by a	
lawar may do to be as we so h	
Impers may rose 5, 20 or even a namera.	
Vij varying rate imput substitution.	
- The mean the Amput is rubalituted varying to early Other	
Brample: frifilier application to maine field in relation to	
Produces to one of its application.	
(II) Constant rate topout Substitution.	
- This means that the amount of formut substituted to	
at Condensia meaning and the an income of the	+
Atter or House with a downer of the Cart He	
Uning of charges will an degrade of other constanting.	
83. Supplementary relationship.	
-The & prayer increase or decrease in number of britters have	
no opprets on the power house	
C. Consettlage relationfiles Complementary relationship.	
-THE A AMERICA AND AND AND AND AND AND AND AND AND AN	
1 1) I to Case 2 and my mine to a state	
In Irvinote (artie) were contrained is pontration	
	1

Extract 8.1: A sample of the incorrect responses on question 8

In Extract 8.1, the candidate gave incorrect responses in all parts of the question. He/she wrote responses that did not meet the requirements of the question.

Candidates who attained average performance in the question were 20.4 per cent. Most of the candidates responded correctly in part (a) on the relationships between input and output in production function. Some candidates provided partially correct responses in different relationship. In parts (b) and (c), the candidates were unable to name and explain the regions of production function in which the stated situations relate. This shows that the candidates' had an inadequate knowledge of the concept of production function.

Nevertheless, 4.3 per cent of the candidates performed well in the question. Such candidates correctly explained the relationships between inputs and output in the production process in part (a). Moreover, in part (b) and (c), they managed to name and explain the regions of production functions in which the stated situations relate. This signifies that the candidates were knowledgeable of the concept of production function. A sample of the correct responses in the question is illustrated in Extract 8.2.

8 (i) Constant return production: In this way The amount of	
input used would gue to amount of output	
6 production function	
il .	
(npvs)	
· · · · · · · · · · · · · · · · · · ·	<u> </u>
output	
DT was obver the construction Out at it.	
() Increasing renon, increase in Output the inp	
ut the Out put remain at the same here	
input	
output	
The Diminishing return, in this relation ship increase is input	
Lead to decrease in output. This may be	
due to excessive application of perturers	
like NPIC INitigen potessium, jand phisip	
hones,	
Input	
output	

DI The region of production function the school might	
produce is region I	
Rocson	
This is because / region I it normally start when mar	
ginal product is equal to zero hence it is known	
as regun of proclaching	
8 B. The suitable region is region & . This is because the	
farmer has not fully utilize her resources by keeping	
g small number of brulers is a larger poultry	
house	
@ Region III This is because here the farmer has kull.	
overwhitze her resources as required in excess and not	
as required.	

Extract 8.2: A sample of the correct responses on question 8

In Extract 8.2, the candidate performed well in the question despite that he/she did not correctly explained the increasing returns relationship in part (a).

2.1.9 Question 9: Introduction to Agricultural Prices

In this question, candidates were required to explain five possible problems that would face a farmer when marketing his or her agricultural production and give five general solutions to overcome the problems. The question assessed candidates' knowledge of the problems facing the marketing of agricultural products and their solutions.

The question was attempted by 726 (100%), candidates where 349 (48.1%) scored from 0.0 to 3.0 marks, 239 (32.9%) from 3.5 to 5.5 marks and 138 (19%) from 6.0 to 9.0 marks. Figure 10 depicts the candidates' scores in the question.



Figure 10: Distribution of the Candidates' Scores on Question 9

As shown in Figure 10, the analysis shows that 51.9 per cent of the candidates scored from 3.5 to 9.0 marks, whereas 48.1 per cent from 0.0 to 3.0 marks. The general performance of the candidates in the question was average.

The candidates who attained a good performance in the question were 19 per cent. These managed to explain the problems of marketing the agricultural products. The correct responses provided were such as *change in market demand, transportation problem especially during the rainy season, perishability of fresh agricultural produce (milk, fish, vegetables)* and *bulkiness of the agricultural produce leading to storage problem.* Furthermore, they were also able to give solutions to the problems facing agriculture production, including *the regulation of supply, improving transportation system in areas of production, building storage facilities for some produces (milk, fish and vegetables) for example fridge, establishment of processing industries which may process farm produces and increasing selling value.* The candidates showed the competence in understanding the marketing problems and their solutions. Extract 9.1 exemplifies the correct responses in the question.

9,	problems of marketing agricultural products	
	(1)-Buildings of agricultural products	
	- most of the agricultural products and very	
	bulk in such a way that its difficult to	
	star and transport herethis name the	-
	marketability	
	(R1-peristrability of agricultural products	
	- most of agricultural products are very	
	penshable such as timato and eggs beneer can	
	not be stared easily news calls manueting	1
	difficult	
	M1- Seasonality in production of agricultural	
	products	
	- most of agricultural products are produced teaso	
	nallis hence in the season of planting their	· · · · ·
	is deffe scarrity of agricultural ments.	,
	(v)- Laur of proper storage failities	
	- Also most of the famers land beter storings	
	families bence the products which are default	
	to store can be destruyed	
	(4)-poor transport system	
	- also most ofthe famers face a publicance	
	pour transput fuilities, this make it diff	
	icult to transport those agricultural	
	products towards the marked,	

1		
q,	General solutions to overcomp the publican of	
	marketing agricultural mouths,	
	(1) - Establishment of cooperature souéties	
	- It is can help to solve the pursterns because the	
	cooperatives tends to retfin mandeting	
	functions such as prospectation of mouts	
	and visk taking	
	(i)- Establishment of Agro-based industries	
	- also the establishment of industries can help	
	to solve the problem because it convert the	
	run materials into usable ferm here vance	
	the public of storage fucilities	
	(iii) - Improving storage faulities	
	- this also can help to reduce the problems	
	because the agricultural products can be	
	stared property hence safe from destruction	
	(iv)- Improvement of transport facilities	
	- this also help to reduce the publican because	
	it funcitate quick prossour of the agn	
	altural product to a market place and	
L	hence for selling,	
	(v)-use of huffer stock funds and international	
	ommodidy agreement	
	- the funds which are study bester gremm	
	ent can solve the publicus when the	
	mie of agricultural products habeen	
	fallen down, -	

Extract 9.1: A sample of the correct responses on question 9

In Extract 9:1, the candidate responded well in the question but missed a point on the general solutions to the marketing problems (use of buffer stock funds and international commodity agreement).

The analysis revealed that 32.9 per cent of the candidates performed averagely in the question. In responding to the question, most of them did not

come up with all the marketing problems and solutions as required. Some of them only explained the marketing problems correctly. This justifies that the candidates had a partial understanding of the marketing problems and their solutions.

On the other hand, 48.1 per cent of the candidates had a weak performance. Most of these failed to explain the problems that would face a farmer when marketing his or her agricultural products. The problems include *fire outbreak, theft* and *weather hazards*. These are known as risks and uncertainity. Some candidates explained the problems facing agriculture in general like *poor technology* and *climatic changes* instead of the marketing problems. Other incorrect responses provided on the marketing problems include *the lack of bargaining power, poverty of the farmer, language barrier* and *most of the agricultural equipment is fixed in nature*.

The candidates were also unable to give the solutions to the marketing problems. Some of the incorrect responses given were: *reducing price of herbicides, pesticides and fertilizer, control of area under cultivation, a farmer should be educated* and *risk taking.* Some candidates gave ways to overcome risks and uncertainty such as *insurance, diversification, maintaining liquidity* and *production on contract basis* as solutions to the marketing problems. This is an indication that they lacked knowledge of the marketing problems and their solutions. Extract 9.2 is a representative sample of the incorrect responses in the question.

		1
9	Problem that would face a tarmer when marketing	
	appleutual production.	
	17 Thief. This means that a farmer take a	
	problem of his properties to be stealed by.	
	other people hence decrease the trith and	
	power of continue in marketing of agricultural	
	products hence that is problem to farmer.	
	W Lack of support. This means that during	
	marketing y agricultural production a farmer	
	lack support which could tackstate the	
	growth of that agricultural commoduly procluder.	
	(W lack of permanent place to work: This also	
	will be problem tacing tarmer in marketing since	
	tonistance after two month has spending in selling	
	in one area next month being removed from that	
	area hence a tarmer it morally will decreases	
	and will give up	
	(in condentiolity during loan providing: This-	
	means that cometime a tamer what to	
	marketing agrecultural production but need some	
	money when to add more but when what to	
	request there is great condition of giving loan	
	so a farmer realize to drop and from his business	
	Q lack g education. This means that it is	
	the that a farmer whant to maketing	
	agricultural production but does not be complet	
L	in that production so bad people realized	
	to to lying a farmer and product will disapper.	
	for Poverty.	
4		1

	transpl colubry to oursering the problems!	
<u>Y</u> -	uciality solution to overcome the probably	
	I Provision of support. This means that government	
	Strong provide a support on the time configure	
	a furmet to improve me mancetary agri cala	
	red products	
	Weducation should be previous to fame	
	Unis means that when a farmer writeri	-
	agricultured product should have more knowled	
	ge on the thing which him I her want to ata	
	blish.	
	(in parmanent place should be provided to the	
	farmer. This also would help to boost u	
L	businness since when a customers have every	
	day went to buy actually tamer boost checonutate	
	W Minimize condentatily during loan provening	
	also will help to solve a problem a famer.	
	would engage them self in different -	
	marketing tignecultural products since there is many	
	Q Establishment of stick law. This means	
	that for those thief the severly punish	
	ment should provided to them so that that	
	behaviour should not repeat again.	
-	R provièren et funds	
	@ Provision of tracilities.	

Extract 9.2: A sample of the incorrect responses on question 9

In Extract 9.2, the candidate showed the lack of understanding of the marketing problems and their solutions. As a result, he/she responded incorrectly in the question.

2.1.10 Question 10: Fundamentals of International Trade and Farm Planning

The question comprised parts (a) and (b). Candidates were required to: (a) propose four measures to be taken by the government to reduce the effect of low world market prices for its cash crops as a result of COVID 19 pandemic that affected trade across borders and (b) propose four important questions that have to be answered by the farmer before replacing the

tomato enterprise with the fish farming enterprise. The question demanded candidates' to have knowledge of controlling changes in agricultural prices and farm budgeting.

The question was attempted by 726 (100%) candidates; of which 119 (16.4%) scored from 0.0 to 3.0 marks, 245 (33.7%) from 3.5 to 5.5 marks and 362 (49.9%) from 6.0 to 10 marks. Figure 11 indicates the candidates' scores in the question.



Figure 11: Distribution of the Candidates' Scores on Question 10

Figure 11 summarises the candidates' scores, whereby 67.9 per cent scored from 3.5 to 10 marks and 32.1 per cent from 0.0 to 3.0 marks. The performance of the candidates in the question was good.

The data depicts analysis shows that 25.9 per cent of the candidates had a good performance in the question. To a large extent, most of them proposed the correct measures to be taken by the government to reduce the effects of changes in the world market price for the cash crops in part (a). The correct responses provided by the candidates include; *diversification of production, use of buffer stock funds* and *use of stabilization funds*. The provision of the correct measures to reduce the effects of knowledge of the correct measures to reduce the effects of low world market price. In addition, the

candidates were able to propose important questions to be answered by the farmer before replacing the tomato enterprise with the fish farming in part (b). These include What is the amount of revenue that will be lost by getting rid of one enterprise? What extra cost will be incurred in replacing one enterprise by another? What extra revenue will be obtained from the new enterprise? and What amount of cost will be saved by making the change? This suggests that the candidates were conversant with partial budget as a tool in the farm planning. Extract 10.1 is an example of responses from a candidate who did well in the question.

	,
10 a) He of Lie of by Portork funds	
Duna consider Provent Event	
puting period of excess supply at commoduler govern	
ment stories the commoduties so that they can be-	
used during famine (chartage) hence reduce www.price	
or Maintain prize of commodities	
y ,	
(ii) lie of subsider	_
It involves direct payment of to the former 10 that	
When Commutities are add can not being add by-	
high or logitomice. The price is maintained	10
right of the price	· ·
	_
(iii) Contral and under allighting	
Invaria and time at the of attain any	
Invalves government under authorition of straum actor-	
für some crops and allow für other comps we led,	
Loffee It any one want to cultivates get permiting	
hence réduces prile problems	
(iv) lie of International agreements.	
It involves the Countries like Tanzania and Kenna-	
made according they to that that one asignity is marine	
Consistent of and the other is maker produced	
Pait land the and heater and	
of a new agree logente and prevent	
price fluctuations	
6 What amount of revenue will be host when	
changing an interpose?	<u> </u>
	8
(ii) What extra cost will be induced per now	
Interpola?	•
to b) (iii) what amount of cost will be saved	
when reparement will be done?	
· · · · · · · · · · · · · · · · · · ·	
at at at at a source and the state	
What amount 4 king revenue will be obtain	
ed from new interprise!	

Extract 10.1: A sample of the correct responses on question 10

In Extract 10.1, the candidate attempted both parts of the question correctly. He/she demonstrated a good understanding of the price stabilization methods and the partial budget.

Further analysis denoted that 42 per cent of the candidates had an average performance in the question. They proposed important questions to be answered by the farmer before implementing the plan of replacing the tomato with fish farming enterprise in part (b). In part (a), they identified correctly the control measures for price fluctuations in the world market, even though they did not give their full explanations.

However, 32.1 per cent of the candidates performed poorly in the question. In part (a), such candidates were unable to provide the correct measures to reduce the effects of low world market price. Examples of the incorrect responses were provision of good tools and equipment, reducing rate of taxation, transferring in technology from the countries with world market price, provision of industrial development and reducing marketing cost. Some of the candidates provided the preventive measures for COVID 19 as a disease. The responses were imposition of quarantine, government should provide all necessary material that are used for protection against COVID 19, government should provide education to the people on spread of COVID 19 and use of sanitizer frequently. These responses justify that the candidates did not understand the requirement of the question and lacked knowledge of the price control measures for the low world market price. In part (b), the candidates gave wrong questions to be answered before by the farmer when deciding to replace one enterprise with another. Examples of the responses given were; What to produce, How to produce, How much to produce and Where to buy (inputs) and sell (output). This indicates incompetence in the partial budget in the farm planning. Extract 10.2 portrays a sample of the incorrect responses from a candidate who had a weak performance in the question.

10 as i/ should have to insurre check up of the body if be the discase or not at the have been contradoct boundary Vi/Should harr to warh our hand Hogicia something. after touching 111> No Should to cover our have mouth caling Aon the mhel hearthan anot noise whon population of high Podo /6 10 recourseling GNOR. havis Theek hopt duitan ogen ctto +. frenn b ford Justablo typo q Juit to be used hbo yros a of fortilis 111) policetion iv/ Weeding

Extract 10.2: A sample of the incorrect responses on question 10

In Extract 10.2, the candidate responded incorrectly in both parts. In part (a), he/she outlined COVID 19 control measures instead of the price stabilization methods. In part (b), the candidate provided the principles of crop production instead of questions to be answered in replacing an enterprises. The responses indicate that the candidate lacked knowledge of the subject matter.

2.2 134/2- Agriculture 2

2.2.1 Question 1: Plant Breeding

The question had parts (a) and (b). Candidates were required to: (a) account for the six significant achievements that have been made by plant breeding in the crop production and (b) briefly explain four ways in which the application of plant breeding brings about the undesirable effects a crop plants. The question tested candidates' understanding of the concept of plant breeding.

The question was attempted by 726 (100%) candidates, whereas 130 (17.9%) scored from 0.0 to 3.0 marks, 238 (32.8%) from 3.5 to 5.5 marks and 358 (49.3%) from 6.0 to 10 marks. Figure 12 summarizes the candidates' scores in the question.



Figure 12: Distribution of the Candidates' Score on Question 1

Figure 12 indicates that the majority of the candidates (82.1%) scored from 3.5 to 10 marks and a few, (17.9%) from 0.0 to 3.0 marks. Thus, the general performance of the candidates in the question was good.

The statistics shows that 49.3 per cent of the candidates had a good performance in the question. Most of them provided the correct responses in

both parts. The candidates managed to account for the significant achievement in the plant breeding in part (a). Likewise, in part (b), they were able to explain the undesirable effects of the plant breeding on crop plant. Examples of responses given were; *narrow genetic base, reduction in diversity, danger of uniformity* and *underable combinations*. This depicts a high knowledge of the beneficial and harmful effects of plant breeding in the crop production. Extract 11.1 is an example of the correct responses in the question from one of the candidates.

		,
10	i) It increases bried a production: This is because the breeding	
	alguring in man with different arounds hability and production	
	status	
	1211 level to confurb i or part and direct recent at variation	
2	In If want to producing of pest and aneare resistant varients;	
	This is alle to the process of miting different specify to	
	obtain the single erop.	····· , ····
-	ii) It help to improve quality of app; when the app with	5 mm
	low quality beeds with those of high quality the crop	
	produced will have of improved quality	
)	
	iv) 12 improve aduptability of coops; this mean cover produced	
	will be able to adapt the new environment due to the	
	strength it gets,	
	will lead to avoluction or mary high your tolerate back	
	(milibra such as diana since the new deat will	
	LUNGIADORS) SALK (IS USWARD, SINCE WILL JEW PLANT WIL	
	Mare strong impiumity?	
	n/14 leads to the production of new preeds trample hybrid	-
	and VAN which are obtained from other strong plants	·
	Which compine through plant preeding process.	
<u>b</u>	DIE can result to disease transmission, since one plant	
	can affect another blant during plant breeding process.	
	5711 tan results to production of weak plants due to	
	the differences bitween genus of crops involved in plant	
	bileding Diocesi.	

on quality:
es and lemm
to low tolerang
ant involved

Extract 11.1: A sample of the correct responses on question 1

In Extract 11.1, the candidate performed well in all parts of the question.

The candidates who attained an average performance were 32.8 per cent. The candidates in this category managed to account for the important achievements of plant breeding in the crop production in part (a). However, they failed to explain the undesirable effects of the plant breeding in part (b). Generally, the candidates showed a good understanding of the beneficial effects of plant breeding but failed in their harmful effects.

On the other hand, the candidates who had a weak performance were 17.9 per cent. Most of them failed to account for the significant achievement in the plant breeding in crop improvement in part (a). The incorrect responses given were such as *to provide food, it icrease market, it help to get foreign currency* and *it improve life standard of people*. Similarly, in part (b), they failed to explain the undesirable effects of the plant breeding on the crop production. They thus provided responses such as *some fertilizers are acidic which affect the plant growth, through application of industrial chemicals, through use of growth regulators* and *through agricultural activities*. Some of them explained the achievement in the plant breeding instead of the undesirable effects of the plant breeding instead of the undesirable effects of the plant breeding instead of the undesirable effects of the plant breeding instead of the undesirable effects of the plant breeding instead of the undesirable effects of the plant breeding instead of the undesirable effects of the plant breeding. This justifies the failure to meet the requirements of the question. Generally, the candidates lacked knowledge of the beneficial and harmful effects of plant breeding in the crop production. Extract 11.2 presents the incorrect responses in the question.

	0.00 0119
a Crop Production ! Is the	
. process of growing crop , the	
Following are the sugnificance	
Of crop product.	
It to provide the Food pr	
oduction crop production hele	
to provide food production	
It help to provide and ma	
I Feed crop production pro	
vide the animal Feed	
It help to improve liv	
estock production crop pro	
duction improve the live	
Stock production.	
It help to improve the	
Industrial activities it help	
to improve industrial activities	
through production of raw materia	,
It help to Improve econo	
Muc development crop produ	
ction improve economic develop	
ment through production of cush crops	
It help to provide	
the employment opportunity	
the crop production provide emplo	
-Iment oppofurit-1 especiali-1 during production	
J.	
b ways in which the application planb breeding	
bring about undesirable effect	
U Through the use mother progen.	
2) Danish method.	
upmass selection 2V) pedegree selection	

Extract 11.2: A sample of the incorrect responses on question 1

In Extract 11.2, the candidate provided the incorrect responses in both parts. In part (a), he/she accounted for the role of agriculture in economic development instead of the achievement of plant breeding. In part (b), the candidate named the breeding methods instead of explaining the undesirable effects of plant breeding. He/she lacked knowledge of the beneficial and harmful effects of the plant breeding.

2.2.2 Question 2: Introduction to Animal Health

The question was divided into parts (a) and (b). Candidates were required to: (a) outline six measures that farmer should take to overcome the problem of scours in calves in their farmstead and (b) outline four points on how to control Newcastle disease. The question tested candidates' knowledge and skills of livestock diseases.

The question was attempted by 726 (100%) candidates, out of which 185 (25.5%) scored from 0.0 to 3.0 marks, 371 (51.1%) from 3.5 to 5.5 marks and 170 (23.4%) from 6.0 to 9.0 marks. Figure 13 illustrates the candidates' scores in the question.



Figure 13: Distribution of the Candidates' Scores on Question 2

Figure 13 shows that most of the candidates (74.5%) scored from 3.5 to 9.0 marks, whereas a few (25.5%) from 0.0 to 3.0 marks. Thus, generally, the candidates performed well in the question.

The analysis shows that 23.4 per cent of the candidates had a good performance in the question. In part (a), most of them managed to outline the

measures to overcome scours in calves. Moreover, in part (b) they were also able to outline the control measures for Newcastle diseases. This is an evidence that the candidates had a good understanding of the control measures for scours in calves and Newcastle disease in poultry. Extract 12.1 represents a sample of the correct responses from one of the candidates.

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NUaccination - the rour deresse. So the eterrol discose Vallerated Soon appe born avota feedin VI) avoid Exposin opinols +100 Odd Candeporr. astre dispos is a Virol Juch a llowin are the wetter blar Tot ralles should be Tio baund The not order to covid the virolin hon. 01 60 0 new cost the offected hirds Lation. rela isolates 1 inorde geeting the hear the 09 111 rection as to destroy or 0 there Note andios Word over hett eriog

Extract 12.1: A sample of the correct responses on question 2

In Extract 12.1, the candidate provided correct responses in part (b). In part (a) he/she missed one point (vaccination) as the control measures for scours. The candidate demonstrated a good understanding of the control measures for scours and Newcastle diseases.

Data analysis indicates that 51.1 per cent of the candidates performed averagely in the question. Such candidates were able to outline the control measures for Newcastle disease in poultry in part (b). In part (a), they partially provided correct responses for control measures for scours in calves. This shows that candidates had a partial understanding of the control measures for scours.

On the other hand, 25.5 per cent of the candidates performed poorly in the question. In part (a), they failed to outline the control measures for overcoming scours in calves. Some of the incorrect responses provided were *vaccinations, use of antibiotics, never open the carcass of the dead animal, drenching the animal and slaughtering of the affected calves* which were generally the control measures of livestock diseases. Some of the candidates named the control measures for pests and weeds such as *chemical method, biological method, mechanical methods, cultural methods* and *legislative methods*. In part (b), they also failed to outline the control measures for Newcastle disease in poultry. Incorrect responses were such as *medical treatment, provision of poultry nets, prevent grazing on swampy areas, use of chemicals, provision of feeds which contain minerals* and *use of paracetamol*. This justifies the lack of knowledge and skills in the control measures for scours and Newcastle diseases. Example of the incorrect responses in the question is shown in Extract 12.2.

D2: (a), Measures of scours to calves:	
(1) Vallingtion of the animal especially	
Motters.	
(II) Drenching the animal with droigs	
to freat the disease.	
(III) provision of enough water to animal	
Especially mothers.	
(IV) Dewarming the celves by minerals	
and icclone.	
(V) Avoiding direct lastering of colves	
to their mothers.	
(b:) Control of New castle disease:	
(1) Dipping of the animal to prevent	
pavasites.	
(11) Spraying of the animals in order to	
- Prevent Paralites.	
(IM) The use of insecticles to control the	
disease.	
(1V) Valunating the animal to control the	
disease.	

Extract 12.2: A sample of the incorrect responses on question 2

In Extract 12.2, the candidate incorrectly responded in both parts. In part (a) and (b), He/she outlined the general control measures for livestock diseases.

2.2.3 Question 3: Livestock Reproduction, Breeding and Improvement

In this question, candidates were required to explain five points on how the animal breeding can overcome the problem of poor yield and low quality livestock products from local breeds. This question assessed candidates' knowledge and skills of livestock breeding in improving livestock production.

The question was attempted by 726 (100%) candidates, out of which 177 (24.4%) scored from 0.0 to 3.0 marks, 110 (15.1%) from 3.5 to 5.5 marks and 439 (60.5%) from 6.0 to 10 marks. Figure 14 shows the candidates' scores in the question.



Figure 14: Distribution of the Candidates' Scores on Question 3

Figure 14 depicts that most of the candidates (75.6%) scored from 3.5 to 8.5 marks; and 24.4 per cent from 0.0 to 3.0 marks. This signifies that the general performance of the candidates in the question was good.

The candidates who performed well in this question was 60.5 per cent. The majority of them precisely explained how livestock breeding solves the problem of poor yield and low quality of livestock products such as *it satisfy the consumers taste, produce animals which are resistant to diseases, it expand the inheritance pontential of the animal* and *it introduce new genes making the animal better in production*. This is an evidence that they had enough competence in how livestock breeding improves livestock production. Extract 13.1 portrays one of the correct responses in the question.

09	A ' A A BE A A A A A A A A A A A A A A A A
	Himmar breading can Overcome lue problem of poor yilla
+	and low quality of the reversion products in fanzance
-	as follows,
+	(1) Animal preding improve the animal regularie by
	disease and parasite, These ensure the animal
	having good heralls and therefore healthy animal
	Produce the high quality products. Therefore increase the
	Quality of Grop livertode
	(1) Animal breeding Improve the quality of the
	animal production through breeding of the two animals
	with diserable characteristics, where their Combination
	Hulled to form anon offspring with abilities to produce
	high quality products such as mille, meat, eggs etc.
_(III) Animal breeching Increase the quartity of the
Ì	Animal produce due to the pro production arriting
	rills ability to preduce large quantity of animal
	products such as mut, mille,
_(iv) Animal breeding lead to production of post growing
	organism which reach matuilis early, Throng plant
	breeding animals abilits to grow faster will be improved
	hence load to aminal reach reproductive age early hence
	Inerrare the quantilis or Livestock yield.
(I Animal breeding lead to production 9, the
	Animale with large body sine which first
	higher market value. There it lad to increase to
	levistich wild of Tanzania

Extract 13.1: A sample of the correct responses on question 3

In Extract 13.1, the candidate responded correctly in the question indicating that he/she was knowledgeable of how livestock breeding improves livestock production.

Furthetmore, the analysis denotes that 15.1 per cent of the candidates had an average performance. Most of them failed to explain all the required ways in which livestock breeding improves livestock production. Some candidates managed to provide points without explaining them fully indicating that they had a partial understanding of the subject matter.

However, the candidates with weak performance were 24.4 per cent. Most of them provided incorrect responses on how livestock breeding improves livestock production. The incorrect responses given were such as *control pest and diseases, vaccinating animals, giving time to rest, fecundity* and *feeding them with water*. Some of them explained the methods of breeding like *inbreeding, cross breeding, line breeding* and *pure breeding* instead of how breeding improves livestock production. Likewise, some outlined the characteristics of good dairy cattle such as; *wedge shape body, must be fertile, resistance to some diseases and parasites* and *long lactation period* instead of addressing the questions' requirement. This signifies a low understanding of how breeding improves livestock production. Extract 13.2 shows examples of the incorrect responses in the question.

3	Cn-upgradnig	1
	- 1stul wass between the indigenous female	
	animal with exteric male animal, this importe	
	he grew rate of animal	
	(II)- Line crossing	
	- Is the closs between distantly related animal	
	but hand common ancestral; it in help to	
	improve ability of currinal to adapt	
	(iii) - pure breeding	
	- 15 the wass between the animals of the	
	same meed in the freed,	
	(iv) - cross meeding	
	- Is the wass between the unrelated animal	
	of the same bread.	
	(n- out crossing	
	- is the crossing between the animal	
	which have unrelated breachs phisminne	
	the quality of products to animal	

Extract 13.2: A sample of the incorrect responses on question 3

In Extract 13.2, the candidate performed poorly in the question by explaining the incorrect the methods of breeding.

2.2.4 Question 4: Introduction to Weed Science

The question consisted of parts (a) and (b). Candidates were required to: (a) use five points to illustrate disagreement with farmers' belief that, using different proper methods to control weeds will one day have their crop farms completely free from weeds and (b) briefly describe five ways on how weeds cause the decline in the agricultural production. This question examined candidates' knowledge of the concept of weed.

The question was attempted by 726 (100%) candidates, whereas 154 (21.2%) scored from 0.0 to 3.0 marks, 198 (27.3%) from 3.5 to 5.5 marks and 374 (51.5%) from 6.0 to 9.5 marks. Figure 15 summarizes the candidates' scores in the question.



Figure 15: Distribution of the Candidates' Scores on Question 4

As shown in Figure 15, the majority of the candidates (78.8%) scored from 3.5 to 9.5 marks and 21.2 per cent from 0.0 to 3.0 marks. Therefore, the performance of the candidates in the question was good.

The analysis shows that the candidates who performed well (51.5%) in the question responded correctly in nearly all parts of the question. In part (a), they correctly gave points to disagree with farmers' belief that using different proper methods to control weeds will one day have their crop farms completely free from weeds. This suggests that they were familir with the adaptation of weeds to the environment. In part (b), they managed to describe how weeds cause the decline in the agricultural production. This indicates that the candidates had a good understanding of the harmful effects of weeds. Extract 14.1 is sample of the correct responses in the question.
410 it Weeds have ability to grow by both regitative-	
part and speed (generative propagation). Thus this make -	
the weed to be difficult to be controlled in the field-	
because when they are cultivated in the farm they	
regrow uning vegitative parts.	
ii) Seed of Weeds have dispersal mechanisms by	
having the special structure for dispersion example	
black fack can attach to the animal hairs and hu-	
man clother and they are dispersed from one place-	
to another and hence this make difficulties to control	
them.	- 1
iii) Seed of Weeds have ability to remain domant	
-for long period of time when the condition is -	
unfavourable and when the condition become favoura.	
ble for their growth they start to gow. Thus this make	
them to be difficult to control.	
iv) kleeds mimeary resemble to other crop plant, This	
means some weeds are resemble to cop plant, by ha-	
Ving the crops plant characteristics -torexample the.	-
wild finger millet resemble with millet and hence this.	2 11111111111111
make them to be difficult to control in the field.	
U. Some kleeds are heavy feeders. This means that	
they have roots which have be penetrated much-	
into the soil and thus this make them to be difficult	
to be control example couch grass (Digitaria scalarum)	
0	

Abo it Weeds compete with crop plant for space, nutri-	
ents, light and oxygen Cair), This competition cause -	
the decline in agriculture production.	
d t	
ii' 1x leeds produce the chemical substance that inhibit	
t. the growth of crop plants and hence reduction -	18
in yield and slow down the process of harvesting.	
1117 Weeds habour Pest and disease and hence such-	
pest and disease attack the coop plant and thus this.	
Cause the elective in agriculture production.	
iv) Island, cause the blockage of the water channels-	
for irrigation and hence this limit the supply of su-	
Hivient moisture for plant growth and thus decline-	
in agriculture production occurs.	
N Wpede reduce the quality of crops products and-	
hence affecting the price of the farm products in the-	
market this teach to low output to the tarmers and -	
thus causing decline in agriculture production.	

Extract 14.1: A sample of the correct responses on question 4

In Extract 14.1, the candidate responded correctly in almost all parts of the question. The exception is in part (b) where he/she missed one point on the harmful effects of weeds that cause the decline in yield (blockage of water channels).

Further analysis depictes that 27.3 per cent of the candidates performed averagely. Most of the candidates were able to describe the harmful effects of weeds that cause the decline in yield in part (b). In part (a), some of them did not exhaust all the adaptation of weeds as it was required. Some were unable to understand the action verb used. Thus they outlined points instead of giving illustration. This implies that the candidates had a partial knowledge of the adaptation of weeds to the environment.

On the other hand, 21.2 per cent of the candidates had a weak performance. Most of such candidates responded incorrectly in almost all parts of the question. In part (a), they did not understand the requirement of the question to illustrate the adaptation of weeds to the environement. Some of them provided the advantages of weeds like it supply organic matter content into the soil when decomposed, some weeds are sources of weed for human being, weeds help to control the soil erosion, weeds are sources of feeds for livestock and some weeds are as construction materials. Likewise, others gave methods of controlling weeds such as; biological weed control, chemical weed control, cultural weed cntrol and mechanical weed control. This confirms that they lacked knowledge of the adaptation of weeds to the environment. Similarly, in part (b) they failed to describe the harmful effects of weeds that cause the decline in crop yield. Examples of the incorrect responses were; weed increase cost of production, it cause irritation to workers and some weeds are poisonous to livestock, plant crop which are resistant to environmental condition, keeping of local breeds and the use of sustainable agriculture which result to decrease quality and quantity of crops. This implies that the candidates lacked the subject matter knowledge. Extract 14.2 is an example of the candidates' incorrect responses in the question.

4	a) (i) altural method control of weed.	
	Is the method of controlling weed on the farm in	
	order to reduce pupulation of weel and increase plant	
	growth such as hand heres burning mulching arcp relation	
	and so only.	
	(i) Brutegreat method control of weed.	
	is the method of controlling weed through brological	
	predators in order to reduce the competition of nutrient	
	and producing how yield such as Grasshopper boarst	
	and su only.	
	(iii) Chemical method control of weed.	
	Is the method of controlling weed through using	
	herbrides and other chemicals in order to reduce population	
	of growth of weed in the farm.	
	N N N N N N N N N N N N N N N N N N N	
	(iv) Mechanical method control of weed.	
	Is the method or controlling weed through using hillage	
	diaming in order to reduce population of week in the	
	farm and allow phant to arow.	
	(v) Intergrated method control of weed.	
	Is the method or controlling weed through keep plant	
	to the guarantine in order to be checked in the	-
	Laboratory and given permittion to phant that crop	
—	ro the country	
1		14 AV 2010

(b) (i) Dormancy breken when condition favour surrival	
- When the farm has more certility lead plant weed	
to get more chance to survive on the farm.	30
(ii) Rapid early growth and expansion	
- Weed grow rapidly than plant on the farm because	
it absorb excess resource from the plant for surlable	
in germination.	
(mir) Absorb resource in excess.	
- Weed absorb all resource for plant such as monstrure.	
nutrients which enable weed themselves for growth.	
(iv) farly and just rest growth.	
- The root of weed grow rapidly in the sort on order	
to absorb water and moneral sally for growth.	
(VI produce a great number of seed.	
- Weed have more effectently to survive in the environment	
because of produce harge number of seed.	

Extract 14.2: A sample of the incorrect responses on question 4

In Extract 14.2, the candidate responded incorrectly in both parts. In part (a), he/she explained the weed control methods instead of their adaptation. In part (b), the candidate provided the responses that were not related to the question's requirements.

2.2.5 Question 5: Pasture Agronomy

The question had parts (a) and (b). Candidates were required to: (a) examine five benefits of applying the rotational grazing in the pastures and (b) briefly explain five principles underlying the pasture improvement. The question assessed candidates' understanding of the concept of pastures.

The question was attempted by 726 (100%) candidates out of which 32 (4.4%) scored from 0.0 to 3.0 marks, 85 (11.7%) from 3.5 to 5.5 marks and 609 (83.9%) from 6.0 to 10 marks. Figure 16 illustrates the candidates' scores in the question.



Figure 16: Distribution of the Candidates' Scores on Question 5

According to Figure 16, the majority of the candidates (95.6%) scored from 3.5 to 10 marks and a few (4.4%) from 0.0 to 3.0 marks. Generally, the performance of the candidates in the question was good.

Most of the candidates who performed well (83.9%) in the question attempted correctly in both parts. In part (a), they correctly examined the benefits of the rotational grazing in pastures including *animal do not walk for a longer distances for grazing, it allows maximum use of pasture by livestock, it reduce the build-up of pests and dieases, animal wastes are distributed evenly in all paddocks* and *pasture is given time to regrow before it is grazed again.* The candidates demonstrated a good mastery of the benefits of the rotational grazing. Moreover, In part (b) they were able to explain the principles for pasture improvemnet by providing responses such as *bush clearing in order to control harmful animals and tsetseflies, harrowing to control weeds, seeding or reseeding to restore the pasture plants* and *adjustment of stocking density to carrying capacity in order to allow sufficient regrowth.* This proves that they were conversant with the principles underlying the pasture improvement. Extract 15.1 is an example of the correct responses in the question from one of the candidates.

	L CALLER ALTERNA MALERIA ALTERNA	
5 (2)	Repetit of ontational according .	
<i>f</i>) (4)	Situp of Tolucond, giving	
(1)		
(2)	It help to control tucks	
	The presence of cattle in the pasture lund help tules	
	to complete their life sycle so in case of grazing.	
	rotationally it mule the elimination and distriction	
	of tiles	
(ni)	It has a carting management.	
	aff' i i i i i i i i i i i i i i i	
	neutional growing it help in managing parture to	
	TIIsure proper utilization and feeding of parture land	
(11)	It help to avoid overgrazing division of the parture	
	in the padiloiles help the farmer to maintain the	
	pasture land by avoiding total exhaustment of the	
	arous since there is alternation of grazing side.	
(51)	It help to water will conving -	
	Tarting a million by the section time	
	rearing of animales in small area for a long line	
	unuch is smull than carrying capacity may lead	
	to The soil eronion due to total lois of the	
	toul cover	
(1)	It allow regeneration of the grazed partier example.	
	for pasture which are in mature example legunes-	
	and grass will generate equally while area are	
	allowed by a rest around	
	mining fritting	

·		use only
5(b	, Principles of pasture improvement.	
(2)	Watening .	
	The supply of mater to the parture land may allow.	
	The continuus supply of fodder all the time transple.	
	rupphiel with mater within two meeter are carly	
	for graning	
(1)	To support nutricul manifest 1 1	
	pasture should be supplied with firthing to allow	
	nutrient supply pr proper durchipment	
	$\mathcal{D}_{\mathcal{A}}(\mathcal{A}) = \mathcal{A}(\mathcal{A})$	
(11)	The most energy of himse programme is and	10111
	disease which may cause the exhaustment and and	
	loses in parties so when they are controlled parture .	
	remain out at yout state	
(יע)	Maliney of the fire breaks and paddaching to avoid	
	the distriction by fire outbrack and wild annials.	
	respectively. The partner rund thould be fined for.	
-	propur managament and avoid fire effect -	
(م)	Reserving after growing and planting sheef true	
	After gaining parture land may love some of the	
	spines such as leguminous so it should be reserved	
	in mour commons supply of quality fodder -	

Extract 15.1: A sample of the correct responses on question 5

In Extract 15.1, the candidate showed a good mastery of the concept of pasture by providing correct responses in both parts of the question.

Moreover, the statistics indicate that 11.7 per cent of the candidates had an average performance. Most of them did not illustrate all the benefits of the rotational grazing in part (a). They included incorrect responses such as: *improve quality of pastures, less labour is required* and *increase production*. Likewise, in part (b), they did not come up with explanations on all principles for pasture improvement demanded. They provided some incorrect responses such as *the use of drought resistant varieties, proper spacing and application of proper harvesting methods* which are among principles of crop production. This suggests that the candidate had a partial understanding of the concept of pasture.

On the other hand, the candidates who had a weak performance (4.4%), to a large extent, responded incorrectly in both parts. In part (a), they incorrectly examined the benefits of the rotational grazing as; *it is cheap method, it make the pastures palatable, it carry large number of animal, animals are free to move from one point to another* and *it enables livestock to be free in mating*. Other incorrect responses were such as *source of foreign currency, provide employment, source of income* which are principally the role of agriculture in general. In part (b), they were also unable to explain the principles for pasture improvement by giving incorrect responses such as *palatability, high nutritive value, adaptability of the pasture* and *free from toxic*. Other incorrect responses provided were pest control method like *physical methods, cultural methods, biological methods* and *chemical methods*. Failure to meet the requirement of the question affirms the understanding of the concept of pasture among the candidates. Examples of the incorrect responses in the question are illustrated in Extract 15.2.

	•
5. 01	1
12 To obtain Pasture which have good guality	
and quantity.	l
in the methode are rich in moisture content	
Children and the light	
Jo that to be good for liverious.	
his to improve the palatability of parture	
so that to be likely to the livertock.	
inter a is viscosta in putritue under of	
Willer D Increase in manual calls	
the pasture species due to proper management	
nt.	
VS Also the actuse obtained have and adap-	
- Auto - publics conductor	
terbility to livestock.	
	<u> </u>
h	
with the must have anothe putitive value	
me partine miller neve phough waining value	1
for the livertock.	
statistic and all the public + 4	1
South the pastility should be palalable to the	+
livertsch.	
iii) Also parture species should be adaptive to the	
livetosta	1
"Allo pastine species should have be succulent. It	
should contain water) Monture content.	
vi Alco it shall contain feed addition on that	
+ i i i i i i i i i i i i i i i i i i i	-
to improve growth of animali.	12

Extract 15.2: A sample of the incorrect responses on question 5

In Extract 15.2, the responses provided by the candidate in both parts did not align with the requirement of the questions. Thus he/she proved the lack of understanding of the pasture.

2.2.6 Question 6: Crop Pests

The question comprised parts (a) and (b). Candidates were required to: (a) briefly explain four cultural methods to be employed by the farmer to supress insect pests in the new growing season in the cabbage garden and (b) suggest five agronomic measures for controlling the maize stalk borer. The question examined candidates' knowledge and skills in insect pests' control.

The question was attempted by 726 (100%) candidates, whereby 7 (1.0%) scored from 0.0 to 3.0 marks, 83 (11.4%) from 3.5 to 5.5 marks and 636 (87.6%) from 6.0 to 10 marks. Figure 17 illustrates the candidates' scores in the question.



Figure 17: Distribution of the Candidates' Scores on Question 6

In view of Figure 17, the majority of the candicates (99%) scored from 3.5 to 10 marks, while only 1.0 per cent from 0.0 to 3.0 marks. Thus, the general performance of the candidates in the question was good.

The candidates with a good performance in the question (87.6%) managed to explain the cultural methods of controlling insect pests in part (a) such as *crop rotation, mulching, sanitation and farm hygiene, resistance crop variety* and *use of traping crops*. In addition, in part (b), they correctly explained the control measures for the maize stalk borer, which are *the burning of crop residues, early planting, inter cropping with other crop plants* and *use of the pests*. Extract 16.1 presents a sample of the incorrect responses in the question.

1		
607	iii> Crop rotation	
	This involves alternation of crops in a successive	
	season or year, the crops like cabbage have	
	to be alternated with Sorghum as they are of	
	different family, this will prevent the effect of	
	Specific pests on crops.	
	iv> Observing field hygiene	
	The formers field should be neat and the	
	crop residues should be burn't over time so	
	as to control the pests.	
	· · · · · · · · · · · · · · · · · · ·	
6 6>	AGRONOMICAL MEASURES TO CONTROL IT ARE;-	
	i> Planting of healthy and resistant Varieties	
	of maize that will minimize the effects of	
	maize stalk borers,	
	ii) Use of clean seeds that are free of residues	
	of the pathogens to prevent dissemination of	
	the pest to attacking the plants.	
	in Correct spacing of the maize plants to	
	prevent easy contact by the stalk borer peits	
	this minimizes the acess of the pests to the	
	plant'	
	iv> Observing field hygiene through measures	
	like Roqueing which burns the crop	
	residues thus preventing perpetuation of stalk	
	borprs ,	
667	V Crop rotation of maize plants with other	
	dont peries that will help to break the lice	
	cucle of maize stalk borer pert	

Extract 16.1: A sample of the correct responses on question 6

In Extract 16.1, the candidate attempted both parts of the question correctly. He/she correctly explained the control measures for insect pests in part (a) and (b), respectively.

The analysis demonstrates that 11.4 per cent of the candidates performed averagely. Most of such candidates failed to exhaust all the control measures for the insect pests in part (a) and (b) respectively. Some provided other methods of pests' control such as *biological and chemical methods instead of cultural* and *agronomic methods* demanded. This shows that they had an insufficient knowledge and skills in insect pests' control measures.

Contrary, statistics indicates that 1.0 per cent of the candidates had a weak performance in the question. Generally, such candidates failed to explain the control measures for insect pests in both parts (a) and (b). They also responded by providing the general methods of pests control such as *chemical*, *biological*, *mechanical* and *cultural methods* instead of the specific control measures for the pests named. The candidates failed to understand the requirements of the question, which implies the lack of knowledge and skills in controlling insect pests. Extract 16.2 presents a sample from one of the candidates' incorrect responses in the question.

(a) Cultural method to suppress insert pert
6 (i) Hand picking; This Used by Farmerst
by picking the inject pest like grasshow
when they are in little number.
Lii) Mechanical killing by Using tools: -
a source (an using to blander to kill-
the incost wet to reduce their
Pilait on the triald
little such Crops : A Farmer can plant-
where the Field Wine Course Conce
than on the field in solt I am alloching
the prevent mile print address
hid Planting attactive Circle was
the Field Alie Evely man to watche
The field this field attack of the
a as the most in a is per alling to
planted yops which is allottive to
Million of Habaan Grade Ilie man
Traduce of recept sups, with mays
Heavie mile part in the part of this
incom yop nay remage in by-
- Producing warmful Porton a required
(b) rigronomical measures to control perc.
UTANTIN OF Cherapy Cops on the
tield, Feduce effect of 1 Fost q1-
Herapy HOPS PROduce Porton Which
attock the prest.
histlanting attractive cropt near-
to the Field, this art as 1001 top
Prevent pest to reach to the crop field-
to make an crops to be tree trom-
pert attacks. 1

	400 0111
(iii) Mixed Farming A Farmer may-	
grow more than one types of copst-	
reduce port, attack as they are specifi	
cto alcertain crops.	
(ju) Use of cover loops this-	
reduce pest From attacking the yield	
as the Kertain coops covered by -	
another one crop.	

Extract 16.2: A sample of the incorrect responses on question 6

In Extract 16.2, the candidate responded incorrectly in all parts of the question. He/she provided responses that were not the control measures for insect pests and in some cases the candidate included physical methods (hand picking) contrary to the question requirement.

2.2.7 Question 7: Plant Diseases

The question had parts (a), (b) and (c). Candidates were required to: (a) suggest a disease which is characterised by the mass of dark brown/ black spores like soot in the flowering parts of sorghum and maize which have intercropped, (b) mention six possible cereal crops that can be attacked by the disease suggested in (a) and (c) identify four measures that would be used to control the disease in the next crop growing season. The question examined candidates' knowledge and skills of plant diseases.

The question was attempted by 726 (100%) candidates, of which 22 (3.0%) scored from 0.0 to 3.0 marks, 288 (39.7%) from 3.5 to 5.5 marks and 416 (57.3%) from 6.0 to 9.0 marks. Figure 18 summarizes scores in the question.



Figure 18: Distribution of the Candidates' Scores on Question 7

In reference to Figure 18, the majority of the candidates (97%) scored from 3.5 to 9.0 marks, whereas 3.0 per cent from 0.0 to 3.0 marks. Generally, the performance of the candidates in the question was good.

It was observed, in the analysis that, 57.3 per cent of the candidates had a good performance in the question. Most of them provided responses that greatly met the requirements of both parts. In part (a), they managed to suggest a disease affecting the maize as smut (*Ustilago maydis*) while for sorghum they identified sorghum head smut (*Sphacelotheca sorghi*). In part (b), they correctly named other cereal crops that can be affected by the disease such as wheat, paddy, barley, finger millet and bulrush. Similarly, they were also able to give the control measures for the disease affecting the maize and sorghum in part (c). This is an indication that the candidates were knowledgeable and skilled in the smut disease. Extract 17.1 represents a sample of the correct responses from one of the candidates.

use only The 7-191 disease when ting (is Marze Common mane Imu whe eause v (u Hear 1 vh 14 celo the ca (b) The Perec ero fm are 1.00 (ir Gin Rice (1) (V) mane (VI Sorghum C The 1urel The eh sease. 61 lo The eerea eropo be mus inter 201 Th egumes cane 01 crops. Hoe transmission. (iii Plantin planting elean materia non (1) 14 use ere TO prevent The 65 ernative hest such a neer 1st he mi whon no crops.

Extract 17.1: A sample of' the correct responses on question 7

In Extract 17.1, the candidate performed well in all parts of the question. However, he/she repeated the maize and sorghum in part (b).

The candidates who had average performance in the question were 39.7 per cent. Such candidates correctly named the other cereal crops that are affected by the disease of maize and sorghum in part (b). In part (a), they generalised

the disease as smut instead of the smut in maize and sorghum head smut in sorghum. Moreover, in part (c) they provided a partially correct response for the control of smut disease. This signifies the possession of an insufficient knowledge and skills in the smut disease.

Conversely, the candidates who had a weak performance in the question were 3.0 per cent. Most of them attempted all parts of the question incorrectly. In part (a), they were unable to identify the disease affecting the maize and sorghum. Examples of the incorrect diseases suggested were sorghum rot, maize rust and sorghum wilt. Some of them named the disease pathogens such as bacteria, fungi and virus instead of the diseases affecting the crops. Others mentioned the crop pests like maize weevil, sorghum weevil, and maize stalk borer. In part (b), they also failed to name other cereal crops that can be affected by the disease of maize and sorghum. Examples of the incorrect responses given were coffee, cassava, sunflower, pumpkin, cotton, peas, cabbage and lettuce. The candidates seemed not to understand the meaning of cereal crops, which meas any grass cultivated for its edible component (grains). The failure to identify the disease affecting maize and sorghum made the candidates to fail to give its control measures in part (c). The incorrect responses such as fallowing, proper spacing, use of pesticides, application of fertilizer, use of anti-biotics, observing dead season and ensuring correct moisture condition in the soil were provided by the candidates. Such responses indicate the lack of knowledge and skills in the smut disease. Examples of the incorrect responses in the question are portrayed in Extract 17.2.

1/12) Jorghum - Anot Kacterial duease	
Mass of dark brown/black spores => Mildow tungi dise	uso.
(b) Rlipht: Bacterial diseases?	
= Cottoo	
Final discover	
tory cilieate	
- Gen	
- l'offer :	
7 (1) Four measures would be used to control	
the disease for the coming next crop growing	ing
Jeason'	
in Russian a Recorder Coppe: Russian rac	
had to dection this hadn't at a pathoaco	
Hort Course durages to Annoal plant (
the lass take late it had to cont	h)/
When buinning take place it hans to com	4
alloave for the coming rext cloth grown	<u>ng</u>
Jeason.	n
IIV We of chemical nichoas, Application	0
of chemical in The field also help to Contry	
disease to crops which grow at the next	
Jeason ·	
70 white doed control This also is	
the interve add decision, into the	
measure that could be alled to control disea	<u>(6</u>
to the plant because when the farmer observe	
dead reason it well be drifficult for Cropt	lc
get dizease.	

Extract 17.2: A sample of the incorrect responses on question 7

In Extract 17.2, the candidate responded incorrectly in the whole question. In part (a), he/she wrongly identified the disease affecting the crop but failed to

give its control measures in part (c). In part (b), the candidate named crops other than cereals.

2.2.8 Question 8: Environmental and Technological Challenges in Agricultural Development

The question constituted parts (a) and (b). Candidates were required to: (a) justify the benefits of practicing sustainable agriculture to both environment and consumers' welfare in Tanzania by giving six points and (b) briefly describe four methods of the sustainable agriculture to be practised by farmers in their farms. The question assessed candidates' understanding of the concept of the sustainable agriculture.

The question was attempted by 726 (100%) candidates whereas 138 (19.0%) scored from 0.0 to 3.0 marks, 387 (44.5%) from 3.5 to 5.5 marks and 201 (36.5%) from 6.0 to 10 marks. Figure 19 summarizes the candidates' scores in the question.



Figure 19: Distribution of the Candidates' Scores on Question 8

Figure 19 shows that majority of the candidates (81%) scored from from 3.5 to 10 marks and 19 per cent from 0.0 to 3.0 marks. Thus, the performance of the candidates in the question was good.

As per statistics, 36.5 per cent of the candidates performed well in the question. In part (a), most of them were able to give the benefits of the sustainable agriculture to the environment and consumers' welfare. In part (b), the candidates correctly described the methods of the sustainable agriculture to be practiced by farmers. Extract 18.1 represents a sample of correct responses from one of the candidates.

8(9)	The following are the benefits of sustainable agriculture	
	to both environment and consumers.	10 110
	i> It ensures environmental conservation	
	sustainable agriculture does not encourage on high we	
	of the synthesized chemicals which deteniorate the environment.	
	Therefore non-use of the chemicals makes the environment	
	to be free from the residual effects of chanicals thus environmental	
	conservation .	1.1.000
	ii) It ensures Public health sufety	
	Since the agricultural process does not involve	
	industrial made inputs which could be altered genetically,	
	the practice of sustainable agriculture helps to protect	
	concurrers from health effects since the genetrically altered	
	crops may develop toxicity thus dangerous to consumers	
	×	
	iii) Reduction in cost is ensured by sustainable agriculture	
	Non-use of synthesized chemicals in Lurge amount	
	reduces cost of production since it is replaced with practices	
	such as biological means which are self perpetuating,	
	therefore cost of production is low and price of crops received	
	by consumers is affordable also	
	Iv) sustainable agriculture avoid extinction of	
	bene firsal organisms in the environment such as	
	Pest predators since it does not involves use of	
	chemicals which have broad spectrum of causing effects	
	to the beneficial organisms	
	v) sustainable agriculture avoids changes in	
	environmental systems such as global warming	

		use only
8(9)	V) since its practice does not involve the emission of	
	harmful gails and chemicals to the atmosphere therefore	
	De Berner of Olle I'll I'll I'll	
	the storage of problems like slobal warming,	1
	Ni> Sustainable agriculture results into production of	
	crops whose taste is not altered therebut become	
	has been to the converse	_
	bene ficial to the consumers.	
00.	The Allewise are the style of a hall with a	
8 (B)	the following are the methods of suspinable agriculture	
	Lo be used by farmers	
	i) Crop rotation	
	This is the action of growing different crops on	
	the same piece of Land in successive craige. This parties	1. 181
	i brothad at it all i artal as a t a later	
-	is continued to any interest and diseases	
	and elso enrich the soil with fectility due to inclusion of legumes	
	in the cycle.	
	i> Mulching	
	This is practice which involves covering the cop	· · · · · ·
	field with mulch material. The mulch material especially	· · · ·
	the property decoming of all a triate t	
	the side of the second and levele nutrients into	
	The soil thus increasing fertility of the soil	
	ui) Use of organic manure	
	This is the action of using the waste products	
-	from farm animals such as cattle and use them in the	
	field to parch the will with a treat to	-
	feetility of the call	
		5
8(b)	iv> The use of natural pest predators	
	This is the action of using the natural organisms	
	which feeds directly on the pests, for example, the use	
	of praying manter to control giant lopper and use	
	of chicken to control cotton stanfer.	(Designed a

Extract 18.1: A sample of the correct responses on question 8

In Extract 18.1, the candidate performed well in the whole question. This justifies the possession of a sufficient knowledge of the sustainable agriculture.

Further, the data analysis shows that 44.5 per cent of the candididates performed averagely. The candidates provided partially correct responses in both parts of the question. Some of the candidates did not come up with all the benefits and methods of the sustainable agriculture in part (a) and (b), respectively, implying the possession of an insufficient knowledge of the subject matter.

On the other hand, the candidates who had a weak performnce were 19 per cent. Most of them provided responses that could not meet the requirements of the question in both parts. In part (a), they were unable to justify the benefits of the sustainable agriculture. Their responses were such as *it reduce risk and uncertainty, the use of better fishing gears, it encourage investments in agriculture, it is easy and more efficient, it improve infrastructure* and *stabilize the community and the families*. Likewise, in part (b), they failed to describe the methods of the sustainable agriculture to be practised by farmers. They provided incorrect responses like *planning, incentive and equity, provision of education, avoid bush burning, proper use of industrial fertilizer, application of herbicides and pesticides and emission of non toxic gases*. Such responses were not related to the requirements of the question, indicating a poor understanding of the concept of the sustainable agriculture. Extract 18.2 shows the example of the incorrect responses in the question.

\land	
A lift help to obtain numtions foods	<u>.</u>
/ like it help to conjerve the environment hence it	
choice pollution	19 A.
iiiy 14 Maintain Soil Fertility	
with Maintan Microprophism which are present	
in the fail since any as chemicals	
in the source of orbital	
with increase economic used of the land	
v>	
bill Principle of care	
Principle of health,	
Principle of fainess	1
principle of praine	

Extract 18.2: A sample of the incorrect responses on question 8

In Extract 18.2, the candidate responded incorrectly in part (b). In part (a), he/she got only one point correct (help to conserve the environment hence avoid pollution).

2.2.9 Question 9: Plant Diseases

The question had parts (a) and (b). Candidates were required to: (a) give four factors that make fungi to be the most important plant pathogen and (b) explain how the following practices help in eradicating diseases (i) planting clean seeds (ii) crop rotation and (iii) burning of crop residues. The question tested candidates' knowledge and skills of plant diseases.

The question was attempted by 726 (100%) candidates, whereas 85 (11.7%) scored from 0.0 to 3.0 marks, 316 (36.6%) from 3.5 to 5.5 marks and 325 (51.7%) from 6.0 to 10 marks. Figure 20 indicates the candidates' scores in the question.



Figure 20: Distribution of the Candidates' Scores on Question 9

Reffering to Figure 20, the majority of the candidates (88.3%) scoresd from 3.5 to 10 marks, while 11.7 per cent from 0.0 to 3.0 marks. Thus, the general performance of the candidates in the question was good.

The candidates who had a good performance were 51.7 per cent. In part (a), they correctly gave the factors that make fungi to be the most important plant pathogens, including heavy sporulation, mode of reproduction, mode of disparsal and ability to survive. In part (b), they also managed to explain how the named practices can help in eradicating diseases. For example, (i) planting clean seeds-clean and certified planting materials are free from pathogens, (ii) crop rotation-it help to cut down the lifecycle of pathogens through starving them for some years and (iii) burning of crop residuals- it can kill the spores, eggs and or innocular of the pathogen. This implies the candidates were familiar with the ways of eradicating plant diseases. Extract 19.1 exemplifies the correct responses in the question.

<u> </u>		
9.	@ Factor that make fungi to be the	UNCOUNT OF UN
	Mut important plant pathogos.	
	O Heavy sponstation.	
	- Jungi produce many spores which later will	
	grow to Mature fungi. Numerous spores ensure	
	the survival chances this important, fungi produce	
	many spore so that in case of any des	
	truction, the total low is avoided, Hence,	
	survival chance is increased other pathoges	
	such as Vinus and barteria, they have relative	
	minimal rate of reproduition compared to furgi.	
	D troop dupenal mechanism:	
	Also the spore of fungi are easily dispose	
	of from place to place. The spare are	
	small and lighter, thus, can easily be	
	carried by Wind and lor Water from one	
	area to another. This, ensure, that fungi are	
	able to spread widely hence affecting dauge	-
	Even in short Time.	
<u> </u>	(i) Hungi have got wide range of horts.	
	Spart from plasts which are the main haits	
	Fungi also are able to survival is sail. Part	
	tesidues in the field zets as an atemative	
	half and presence of weed in the field	
	of any plant, May also all as as alternative	
	hast for tungi.	
	WAbility to live up to next generations	
_	leason when Condition is Untavourable	
	- When the confittion for 3 reproduction	

	· · · · · · · · · · · · · · · · · · ·	
9	a (iv) Continuation	
	is unfavoridate fungi are able to undego domang,	
	that they resume their activity when suitable	
	Condition is a set. Forexample, too high tempe	
	ature affect their metally.	a
	(b) (i) Planting Cleanseeds	
	- Use of un contaminated seeds help a farmer	
	to covered infestation of his other crops from)
	diseaser. This made make a farmer to be free	
	from any diverse council agent because !	
	seed which are used are clean. Therefore.	
	there is no any filease lawing organism and	
	horce Managed to eraditate ficease	
	(1) Cop station:	
	- sterchanging susceptible plants with non-	
	Susceptible ones. Most of disease Cawing agest	
	are hat specifil, that affect only a particular	4
	species of Gop, Forexample, interchanging Mare	
	with beans. When beans rose grown instead	
	of Maise, pathogen such as viris which cause	
	Maize strent duease get affeited hence	
	Ito ducase is costalled,	
	(Ti) Burning of Gop Lesique,	
	Gop residues in the field sets as an alternative	
	hast for due are country agent, and site of	
	reproductions. Therefore, When Plant residues	
	are burned, means that alternative hast	
	for pethogen is detruede destroyed	
	and also pathoged living in residues are killed.	

Extract 19.1: A sample of the correct responses on question 9

In Extract 19.1, the candidate performed well in both parts of the question.

Data depicted 36.6 per cent of the candidates performed averagely. Mostly, the candidates managed to explain ways in which the named factors can help in eradicating diseases in part (b). However, they failed to give the factors that

make fungi to be the most important plant pathogens in part (a). Most of the responses provided focused on the environmental conditions favourable for the growth and development of plant pathogens such moisture, light, temperature and food.

On the other hand, the candidates who had a weak performance were 11.7 per cent. In part (a), most of them failed to give the factors that make fungi to be the most important plant pathogens. The incorrect responses provided were such as have ability to resist fungicide, they are microscopic, have ability to affect the plants and are source of organic manure. Some other incorrect responses were it is used as a source of food, used as a decoration, used in manufacturing different alcohol, used for medicinal purposes and used for making cosmetics. These given responses were on the use of fungi. This signifies the candidates' lack of understanding of the factors that make fungi to be the major causative agent of plant disease. Similarly, in part (b), they were unable to explain how the named practices can help in eradicating plant disease. They provided incorrect responses such as (i) planting clean seedsenable during period to remove debris, in order to avoid introduction of inoculation, leads to quick seed germination, (ii) crop rotation-it help to increase the nutrients in the soil, it control weeds, environment that are used must be less favourable to disease and (iii) burning of crop residues-through green crop residuals, it involve the collection of obtained materials during farm cultivation and it increase fertility to the soil. This proves that the candidates were incompetent in the control measures for plant diseases. Extract 19.2 indicates a sample of the incorrect responses in the question.

the second se	
9(9) Factor that make sund to be most	
important pathogen	
Visuceptible hast	
ivVirullent pathogen	
in Environmental condition	
in Hort.	
	_
(b) (i) Planting clean foods	
The diverse in the same is minimized	
by planting the class coed.	
ii) (rop rotation	
A deep rooted crop must be rotated	
with shallow roted crop.	
iv Burning (nop toridues	
During burning trop toritues the dispose	
dre minimized'	
	+

Extract 19.2: A sample of the incorrect responses on question 9

In Extract 19.2, the candidate responded incorrectly in both parts of the question.

2.2.10 Question 10: Introduction to Animal Nutrition

The question comprised parts (a) and (b). Candidates were required to: (a) (i) describe stepwise procedures on how to compute feed ration using the Pearson Square Method (ii) give the necessary circumstances which necessitate farmers to use the Pearson's Square Method and (b) calculate the amount of each feedstuff in kilograms to prepare 100 kg of chick mash containing 30% Digestible Crude Protein using the following data: 20% Digestible Crude Protein of maize meal and 50% Digestible Crude Protein of fish meal. The question examined the candidates' knowledge and skills of compounding livestock feeds using Pearson Square Method.

The question was attempted by 726 (100%) candidates of which 233 (32.1%) scored from 0.0 to 3.0 marks, 341 (42%) from 3.5 to 5.5 marks and 152

(25.9%) from 6.0 to 10 marks. Figure 21 denotes the candidates' scores in the question.



Figure 21: Distribution of the Candidates' Scores on Question 10

Figure 21 indicates that 67.9 per cent of the candidates scored from 3.5 to 10 marks and 32.1 per cent from 0.0 to 3.0 marks. The data analysis shows that the candidates' performance in the question was good.

The analysis shows that, 25.9 per cent of the candidates who performed well in the question managed to describe the procedures to calculate the feed ration using Pearson Square Method step by step in part (a) (i). Furthermore, in part (a) (ii), they correctly gave the circumstances which necessitate the use of the Pearson Square Method when a farmer wants to mix two or more feeds into a mixture containing a certain definitive proportion of some major nutrients required in the ration. In part (b), the candidates accurately calculated the amount of each feedstuff in a ration using the given data. The candidates demonstrated a good understanding of the use of the Pearson's Square Method as shown in Extract 20.1.

100 (i) Construction of the pearson square.	
(ii) A farmer should put the percentage value	
of the feed requirement at the centre of	
the square.	
Presidential Alternation and Alternation	
(iii) A farmer should write the first and	
second percontage value of the reed stuff	
at the left side of the pearson square	
whereby the pirst value is written at the upper	
part a the pearson square and the other value	
of feed stuff at the bottom part.	
(1V) The percentage value of the food requirement	ż
at the centre is substracted from the percentage	
value of the reed stuffs at the Lore of the square	
so as to obtain the part amount of each	
Feed stuff, which are written at the right sid	2
ce the pearson.	
(V) The part of the amount of the stuff each roud	
shupp are added to obtain total amount	
of the read stuffs.	
(i) Also so as to obtain amount of feed in each	
part hence the specific part containing amount	
of the peed 10 divided over the total amount	
g the feed obtained and multiplied by	
a hundred /	

10 6	(ii) The faimer necressiale to use this method the most
	when there are presence or more than one type of
	reed in formulating the ration.
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	Dura given
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	ren entrope a the chick-mash digeotible = 30 h
	crude protein
	Percent DCP q maize meal = 20%
	Percont DCP a pish meal = 506
	Amount of the chick mash peopleture = lockg
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	300
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	Amount a the make meal - 20 klacks
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	00
-	= 66.61.kg
	An a di mal
	nimaine q the pish meal = 10 x 100 kg
	= 33.33Kg
	. The amount of the maile moal in chick mash is
	66.67kg and amount of pith meat in
	chick mash is 33.33kg.

Extract 20.1: A sample of the correct responses on question 10

In Extract 20.1, the candidate provided correct responses in both parts of the question. He/she showed a high mastery of the use of the Pearson's square method.

In addition the analysis shows that 42.0 per cent of the candidates parformed averagely. These candidates managed to give the circumstances which necessitate the use of the Pearson's square method and accurately calculated the amount of each feedstuff in the ration in part (a) (i) and (b), respectively. In part (a) (i), the candidates knew the procedures for computing the feed ration using the Pearson's square method. However, they but they failed to arrange them step by step.

However, the data indicates that 32.1 per cent of the candidates performed poorly in the question. In part (a), most of such candidates failed to describe the procedures in calculating feed ration step by step. Some of the incorrect responses given by them were farmer should be aware with number of animals, estimation of total protein should be done by the farmer and *improve supplementary feeds.* In part (a) (ii), they were also unable to give the circumstances that necesistate the use of the Pearson's square method by giving responses such as *feed formulation*, the method is not expensive, other methods will fail, the method is suitable when using local materials and it does not require knowledge. In addition, they failed to calculate the amount of each feedstuff in the ration using the given data. Most of them used the algebraic method instead of the Pearson square method. Hence, they arrived at incorrect values of the feedstuff. However, some used Pearson's square method but failed to get the correct answer due to the poor mathematical manipulation skills. Generally, the candidates did not understand the pearson square method and its use in calculating the feed ration. Extract 20.2 is a sample of the incorrect responses in the question.

al @10. Provecture of Pearson Square -> Prepare the Protein Supplement etimole Sun Huner Jeged Callie -J. Prepare the Stevich Supplement Clample the Mare bran - J. John the Elizabilite curcle Pase. In yis maire mind and fith meas calculate the Parapage of tach food (19) the method is Simple and do not need the hunt Jkill wenne every the Sinall farmer Can apply

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- 30 X110 k - 2 .	
10 A 100 FG = 15kg	
The amount of clicetable course Robe.	
In maple meat 15 75kg	

Extract 20.2: A sample of the incorrect responses on question 10

In Extract 20.2, the candidate failed to provide correct responses in the whole question. This demonstrates a low understanding of the Pearson's Square Method.
2.3 134/3 Agriculture 3

2.3.1 Question 1: Crop Science and Production

In this question, candidates were provided with the following specimens: (C_1) -Maize plant affected with the maize streak disease and (2)-Cassava plant affected with the mosaic virus. They were required to carefully observe them and answer the questions that follow. The question comprised parts (a), (b), (c), (d), (e) and (f). Candidates were required to: (a) state three observable abnormalities for specimen C_1 and one abnormality for specimen C_2 (b) identify the carriers of the pathological agents responsible for the observed abnormalities in specimen C_1 and C_2 (c) give six ways in which abnormalities identified in specimen C_1 can be controlled (d) state two ways of combating the situation observed in specimen C_2 (e) give five general symptoms of abnormalities caused by the identified pathological agent in specimen C_1 and C_2 and (f) account for four effects of the abnormalities identified in specimen C_1 and the preventive measures. The question assessed candidates' knowledge and skills in plant diseases.

The question was attempted by 726 (100%) candidates of which 2 (0.3%) scored from 6.0 to 6.5 marks, 90 (12.4%) from 7.0 to 11.5 marks and 634 (87.3%) from 12 to 20 marks. Figure 22 shows the candidates' scores in the question. The question tested the candidates' knowledge and skill in plant diseases.



Figure 22: Distribution of the Candidates' Scores on Question 1

Figure 22 indicates that the majority of the candidates (99.7%) scored from 7.0 to 20 marks, whereas 0.3 per cent from 6.0 to 6.5 marks. Thus, the performance of the candidates in the question was generally good.

The majority (87.3%) of the candidates who performed well in the question managed to state the observable abnormalities of the maize plant affected with the maize streak and cassava plant affected with the mosaic virus in part (a). The correct responses were such as *the plant is seen to be stunted, ring spots or lesion varying from white to yellow observed, the cobs are seen be half-filled and sometimes it may contain few or no seed at all on the maize plant affected with the mosaic virus. In part (b), they correctly identified the carrier of the pathological agent responsible for the observed abnormalities in specimen C₁ and C₂ as leaf hopper (<i>Cicadulina mbila*) and white fly (*Bemisia tabaci*) respectively. The candidates were also able to give the ways to control the abnormalities for the maize streak virus disease and the mosaic virus disease in part (c) and (d) respectively. In part (e), they correctly gave the general symptoms of the abnormalities caused by the identified pathological agents in

specimen C_1 and C_2 . In part (f), the candidates were also able to account for the effects of the abnormalities in specimen C_1 and C_2 . The candidates demonstrated good observational skills that enabled them to identify the observable abnormalities of the specimens. Consequently, they responded correctly to the question due to the possession of adequate knowledge and skills in plant diseases. Extract 21.1 exemplifies the correct responses in the question.

1. @ - Observable - zbnormalities for specimien Ci (2) Yellow longitudinal ships which new parellel to the midrib, that is yellow lines which a run Porable to the Midrib in Leave, (3) Stunded Growth: That - zbnormad Growth in specimien Ci. It is growth a minimal. (3) The cobe produced - we is held filled Filled that if Contain very few number of Seech. - Observable - zbnormating for specimien Co. (3) The leaves are yellowish and disported there is yellow appearance on leave which - observable - the pathological agent responsible - for specimien Ci.			
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4.	(b) Continuation.	
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	be controlled.	
	(2) Flanling resistant Vandes: The varieties	
	Which are raistand to the abnormality in	
	speamen CI (Marze Sheat atseace) should be	
	grin to refuce the effect caused by the duease.	2
	(i) Gop rotation. Merchanging Maine crop	
	with other non-susceptible coops such as beans,	
	this is important because the virus has no	
	effect on begin	
	(iii) bead season; During dead seadon,	
	or close of season plants of a pasticular time are	
	veroited and detroyed. It is no allowed be	
	grow such plant during dead season marder	
	to break the fife orde of iz vinu. The	
	best method of destroying is though burning.	
	(2) Poulainas The is initeline usanting zon	
	latering II to the product of the state	
	-terinoging , here he affected plant	
	Lemoved from the read and devines	
	morder to reduce or anyminiation of oppresse	
	To the other health plant	
	(v) we at certified seeds turing planting	
	the clean feeds, Which are not Contaminated must	
	the use of the disease.	

	101101 - 101010 - 10
A a Continucation	
a) Two ways of combating situation observed	
in Precimen Ca.	
O Use of Cultings from free freeze plant	
during planting. This help to prevent Transmission	
of disease to new zorea hence the situation	
a Controlled.	2
1) Use of registrant varieties: That use	
The varieties which are able to give reactions	
Tor the Pethogen Cauling disease,	
(e) treneral symptoms of the abnormative.	
(P) Leat Chlorosis; This is the uniter mon-	
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- reaction of breakdown of chlorophyll,	
Lear Curing: The N'Z Constillion of	
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1. Continuation.	
P. F. F. F. et the abnormalities identified in spe	
comes ci and Co.	
1) Decrease the quantity of farm freduce;	
The question of products obtained are often	
low this is because the obnormalities Leads to	
repution of produits fonstance, in Mairie, Cobs	
Produced are half filled, thus reductions in	
ruentity of the grain,	
(ii) Lower the quality of farm produits:	
-The nutritional quality of raffected plants	
The often bow. Forecapple, nutritional quality	
of Maise grain the produced from Maize	
part raffected for Maize streak vinus is low,	
(ii) Increased Costs of production:	
- The farmer User More input, but the return	
from the farm Could not Justify the Cost of preadur	
clips. This causes, the farmer to incur bus	
from his or her preduition.	
(i) it also coure from thetage	
In zoeas Where, Marge rand Causara are grown	
for food purpole, When the farmer does not	
take proventive measures it come food shor-	
tage Because, it yield to low towartity	
of produce and hence eventually fow as	_
shortage of food supply.	

Extract 21.1: A sample of correct responses on question 1

In Extract 21.1, the candidate responded correctly in all parts of the question. He/she showed good observational skills coupled with adequate knowledge and skills in plant diseases.

Data analysis showed 12.4 per cent of the candidates had average performance in the question. The candidates showed good observational skills hence correctly stated the observable abnormalities in specimen C_1

and C_2 in part (a). This helped them to identify the carriers of the pathogens in specimen C_1 and C_2 in part (b) correctly. In part (e) and (f), they provided partially correct responses for the general symptoms of the abnormalities in specimens and the effects of the abnormalities stated respectively. However, the candidates failed to give the control measures for the abnormalities in the specimens in part (c) and (d). They provided the general control measures for plant diseases such as chemical, cultural and legislative methods instead of the specific measures for the diseases affecting the specimens. This shows that the candidates had an insufficient knowledge and skills in controlling different plant diseases.

The candidates who performed poorly in the question were 0.3 per cent. Generally, these failed to identify the carriers of the pathogens responsible for the abnormalities in part (b). The responses provided were mainly the pathogens of plant diseases like virus, bacteria, fungi and nematodes instead of the carriers of the pathogens. Similarly, they were unable to give the control measures for the stated abnormalities in the specimens in parts (c) and (d). Examples of the incorrect responses given were *use of insecticides, weeding, burning* and *intercropping*. On the other hand, they managed to provide a few correct responses in part (a), (e) and (f). This is an indication that they had an inadequate knowledge and skills in plant diseases. Extract 21.2 is an example of the incorrect responses in the question.

1.0	to Alunomalities for yourman (1.	
	1) Development of logt lenging. The lenging ullick are divided	
	is along the vern of the loop, be which fairingly the plant	
	become anomations in absorption of well shritight and carbon-	
	drixide for the formation of found	
	IN Uping of the jourgest leaf of the plant	
	to plant contrain menal there parts which are nots,	1
	All II II + DI - H I on the	
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	Is consist by poor adoptubility of the but and low another	
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	in strated growth off plant (sperimes ci)	
	The plant have pear devidering hight due to pour -	
	devel transportation of writer and minoral softer that caused by	
	destroyment of bundles which are yolen and phloem. Also	
	the plant is stunded due to minimum citizoption of naterial regions-	
	ible for formation of freed out as unler, surfalt and susa	
	(carbon durad)	
	Abnomalities of specimum Ce	
	is Apparanuel chlonzis.	
	The vellowish of the plant is ordinared that band to poor	
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	tothe environment day to pur cologitation intake of mertendi	• • • •
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	Their art water of main struct descare which are	
	in the wein the dealer days	<u> </u>
<u>e</u>	The periment of the second sec	
<u> </u>	The pallinguial agent of maile (a) [1 (staduting [1]b)]6:	
	is Property last which	
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1 e.	which boud tothe reduction quality of the plant.	
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	ii) Development of chloropis that cause the least to full of building purchalled to the blensi of the plant leave the plant locans are charged into sollowish.	
	iv Through demanging of the developing manie ferliking marie. I parts are not distanting to the spentic part which are mente to the plant preside are distanticed to the developing. mente.	
	D The destroining of the developing herfr that cause poor development of the Plant here standed growth.	
le	in periment (2. 1) The devolupment of securi (pots) on the poor of the plant. This but to the reduction of the question of the plant.	
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	iii) The development of chloring to the lourp phat. The plant develop the pollowish apice to the plant.	

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<u>1e</u> .	toge to upper stage.	
	V) Willing Of the plant lawy.	
	The plint became wilted due to the vinu atturbed, so the	
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	(i) Through the potrochition of noon oil. These protition	
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	(i) production of low quality of yild. the yield is of	
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	dernals	1.1.
	i) pour production of products on the se next generalisin	
	of the same fimily example careal crops	
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Extract 21.2: A sample of the incorrect responses on question 1

In Extract 21.2, the responses provided by the candidate were mostly incorrect. He/she gave a few correct responses in part (a), (e) and (f).

2.3.2 Question 2: Soil Science

In this question, candidates were provided with the following specimens, equipment, apparatuses and materials: M-Garden soil, Pyrex beaker (100 cm³), weighing balance, wall clock, stirring rod, source of heat, wire gauze and tripod stand. They were required to perform the procedures hereafter and then answer questions that followed:

(i) Weigh a beaker.

- (ii) Weigh 50 g of specimen M and put it in a beaker.
- (iii) Place a beaker containing specimen M on top of wire gauze on a source of heat.
- (iv) Heat specimen M for 15 minutes while stirring and carefully make observations on what is happening during the heating.
- (v) Remove the beaker from the source of heat and let it cool for 15 minutes.
- (vi) Re-weigh the beaker containing specimen M after cooling.

The question comprised parts (a), (b), (c), (d) and (e). Candidates were required to: (a) record the data in the table provided

Weight of beaker (g)	Weight of beaker+	Weight of beaker+
	specimen M before	specimen M after heating
	heating (g)	(g)
(X)	(Y)	(Z)

(b) state the aim of the experiment (c) calculate the percentage loss in the weight of sample M (d) give reason for the colour change in the specimen after heating and (e) give six effects of burning specimen M during the land preparation. The question assessed candidates' ability to determine the moisture and organic matter content of the soil.

The question was attempted by 726 (100%) candidates out of which 151 (20.8%) scored from 0.5 to 5.0 marks, 394 (54.3%) from 5.5 to 8.5 marks and 181 (24.9%) from 9.0 to 13 marks. Figure 23 illustrates the candidates' scores in the question.



Figure 23: Distribution of the Candidates' Scores on Question 2

According to Figure 23, the majority of the candidates (79.2%), scored from 5.5 to 13 marks and 20.8 per cent from 0.5 to 5.0 marks. The performance of the candidates in the question was good.

Data analysis shows that 24.9 per cent of the candidates had a good performance in the question. Most of them responded correctly nearly in all parts of the question. In part (a), they correctly recorded the readings in the table. In part (b), they managed to state the aim of the experiment to determine the moisture and organic matter content of the soil. Furthermore, the candidates were able to calculate the percentage loss in the weight of specimen M in part (c). In part (d), they gave the correct reason as to why there was the colour change in the specimen after heating. In part (e), they also managed to give the effects of burning the soil during the land preparation. The candidates demonstrated good practical skills by following the procedures of the experiment. Hence, they arrived at the correct readings in the table and other experimental results. This was also facilitated by the possession of good measurement and mathematical manipulation skills. Generally, they had a good

understanding of soil constituents. Extract 22.1 is a sample of the correct responses from one of the candidates.

2	a. Table of res	ult.	
	Weight of beater	Neight of booker + Spraren M	Keight of beaks + Speines
	(9)	before heating (G)	Matter heating (9)
	×	18 Y	¶ Z
	51.5	101.5	100.3
	b. The Aim of	the experiment is to determ	nine the amount of
	Organic mat	ter In The soil.	
	J		
	c. Solution		
	Data		s
	Total weigh	t op Sort and beaker before h	eating = 101.5g
	Total wrig	ht of soil and beaker after	heating= 100.3g
	Then.		
	Weight le	151= Weight before hading -	Weight after heading
	Weigh	12 Loss= 101.5g - 100	39
		Weight Loss = 1.29	
	tormulae.		
	porontagel Weight L	ors = Weight Loss, X 100.	
		Total weight before heating	
		in woright = 12g	
_	the wright	of the soil = 50g befor	e heating,
	After h	20 hdg = 48,8g 1	
		505 - 485 = 102	<u>٥</u>
	70 0	51 of M= 102 × 100	
		50	
		70104 of M= 0.024 XII	90
	λ	701051 4 m= 2.4.	/:
	TI TI		1 1 1 0 1 °/
	In percer	rage loss in weight of Jamp	le M13 2.4/.

21.	do The Colour change & due to the burning of organic	
	matter which tend to become black after heating.	
	-> So Colourchange 13 because of burning of Organiz materials	
	ę.	
	1. Burning destruble the misro bacterial activities : Bactoria	
	not work under high Lemperature	
	2. Burning make the Loss of Soil fertility; the ability	
	of the cost to provide nutrient and air to plant 12 reduced	
	so Loss of fertility.	
	3 Death of some plant and Animals; Burning of the soit	
	Cause loss of Biodiversity Inwhich cause loss of some plant	
	and animals.	
	4. Burning decrease or Increase the other Physical properties	
	Af maisoil. Example increase soil temperature, Reduce the	
	water content and favour the sort colour Inwhich it beome	
	the dark soft.	
	5. Also is one of the cultural method of controlling weed;	
	Burning of the soil control some of the weed and this is	
	Cultural method.	
	6. Burning of soil bend to produce ashes which act	
	as Liming material, Ashes are the one produced due to the	
	burning of plant residue and this cause The Increase	
	PH, reduce Acrity.	
	(

Extract 22.1: A sample of the correct responses on question 2

In Extract 22.1, the candidate attempted correctly nearly all parts of the question. He/she missed a few marks in part (c) on the calculation of the percentage loss in the weight of the soil sample.

Further, data analysis indicates that 54.3 per cent of the candidates performed averagely. These candidates showed good practical skills and came up with the correct readings in part (a). In part (b), they also stated the aim of the experiment correctly. Correct readings in part (a) facilitated the candidates to calculate the percentage of loss in the weight of the soil sample in part (c) correctly. Nevertheless, most of them failed to give the reason as to why there was the colour change in the specimen after heating in part (d). Likewise, they were unable to give the effects of burning the soil during the

land preparation in part (e). This suggests that, they had an insufficient knowledge of soil constituents.

Contrary, the analysis shows that 20.8 per cent of the candidates had a weak performance after responding in most parts of the questions incorrectly. In part (a), they incorrectly recorded the data required in the table by giving a variety of incorrect readings. In part (b), they failed to state the aim of the experiment. Examples of the incorrect responses given by the candidates were; *to investigate the action of heat on the soil sample, to determine the effects of heating or burning on the weight of the garden soil* and *determine the loss of soil sample before and after heating*. Moreover, in part (c), they were unable to calculate the percent of loss in the weight of the soil sample. Some of them failed to calculate the percentage loss in the weight of the garden soil due to the incorrect readings in part (a). Others used the incorrect formula for the calculation like

% loss in weight = <u>weight of soil on heating</u> X100% Weight of dry soil

In part (d), the candidates failed to give the reason for the colour change in the garden soil after heating. They gave incorrect responses such as *breaking down of organic matter, decomposition of organic matter* and *microorganisms are destroyed by heating*. Likewise, they failed to give the correct effects of burning the garden soil during the land preparation. Some of the incorrect responses given were; *it is a source of food to the organisms, it control soil erosion, it increase water holding capacity, it maintain the soil structure* and *it facilitate microbial activities* in part (e). The candidates' lack of practical skills resulted in incorrect experimental results. Lack of knowledge of the soil constituents also caused them to fail to respond correctly in the questions. Extract 22.2 presents a sample of the incorrect responses from one of the candidates.

	(0,)	
17	Lucicht a healer (V) have a harden a having to a healer	
-~·	angri y broath wright y broas typ. Wright of breas	
	earner M before + Spearner M	
	heating (3) (V) after heatings	
	(2)	
	98.90	
	10 10 149.90 140.1	
ļ		
	(b) The aim of the experiment is	
	TO DETERMINE THE PERCENTAGE DEINAT	
	ER IN THE SALL	
-	(c) Given	
	Weight a bedree and Specimen before hearing = 148.900	
	Weight a bedress and beginnen siller heating - 190.15.	
	hearing arrantee have here here here	
	negative peroruege 1055 in weight of sample M-	_
	the second secon	
	1 low in Weight & demple H= Weight of Semple M before	
	hearing - weight of Scrope	<u>.</u>
	Matter healthing	
	Tour in hurst a la de M = 119.000 - 110.10 - 9.80	
	2035 11 Way a dempart - 14 1 10 - 140.1 - 1 0g.	
	To in Weight by Jomply M= low of Weight of Jomply M & 100%	
	Total weight of Sample	
	M before hecting	
	1/ in Lucisht a Semale M = 9.89 x 100% = 6.5%	_
	119.900	
	" · · · · · · · · · · · · · · · · · · ·	
	properantinge Tossin Weight 4 Jample Mis 6.5/01	

-	
0	a)
2 -	there was change in colour in the Specimen
C	Her heating this is because
2)	Aug to the decomposition of Organic matter
1	He Joecime o H
	Nuch Heavidali a loss loss (III) (r. 21)
1,1,1	The The driden on of them from the subject of
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(e	
')	I Help to Control Juil boine direcse
n	It will led to the production a product with
h	igh quality due to Improvement of Organic ma
}	ter P
n	of It will activate the Microorganism activity
1	ound in Joecimen M. U
	1) It helps in deterministion a Physical prope
rt	ies a the Joil torexample when the Specimen M
Î	sheated It will become bleck in colour means
1	4 black colour determine the accumulchun of
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	to ense to chase the witching over to be
	ladel on the so all M
	Lichted with the something the second
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2 k	De M Simply because When heated the
	Orgenic Metter Increase hence Improve the
	Itricture q the suit
	y it will increase reproduction due to He
	helin in Urgenic Metter in Hasoll which
	nt increasing reproduction of the crop pla
1	· · ·

Extract 22.2: A sample of the incorrect responses on question 2

In Extract 22.2, the candidate incorrectly responded in almost all parts of the question except in part (b) where he/she provided partially correct response on the aim of the experiment.

2.3.3 Question 3: Livestock Science and Production

In this question candidates were provided with the following specimen, apparatuses and materials: specimen X (Chicken gizzard), knife/surgical blade, forceps, petri-dish and one pair of disposable hand gloves. They were required to perform the procedures hereafter and answer questions that followed:-

- (i) Wear hand gloves.
- (ii) Take specimen X from the watch glass and put it over the petri dish.
- (iii) Use knife/surgical blade to cut specimen X at the middle longitudinally.
- (iv) Empty the content of specimen X on the watch glass and carefully observe the content.
- (v) Remove the outer layer of the inner part of specimen X and make an observation to the remaining layer.

The question had parts (a), (b), (c), (d), (e), (f) and (g). Candidates were required to: (a) name the observed content emptied on the watch glass. (b) give the role of the observed materials in part (a), (c) briefly explain two features of the inner part of specimen X from the observation made, (d) give reason why teeth are not necessary in the organism from which the specimen X was taken, (e) explain how the food particle reach specimen X from the beak, (f) enumerate six features which differentiate the digestive system of poultry from that of other farm animals and (g) draw the system to which specimen X is a part and label ten parts. The question tested candidates' understanding of the chicken digestive system.

The question was attempted by 726 (100%) candidates, whereby 4 (0.6%) scored from 4.5 to 5.0 marks, 67 (9.2%) from 5.5 to 8.5 marks and 655 (90.2%) from 9.0 to 15 marks. Figure 24 presents the candidates' scores in the question.



Figure 24: Distribution of the Candidates' Scores on Question 3

Figure 24 indicates that the majority (99.4%) of the candidates scored from 5.5 to 15 marks, and 0.6 per cent from 4.5 to 5.0 marks. The performance of the candidates in the question was good.

According to the statistics, 90.2 per cent of the candidates perfromed well in the question after responding correctly in almost all parts of the question. Most of them correctly named and gave the role of the observed content emptied on the watch glass as grity small stones which grind grains and fibres into smaller particles in part (a) and (b), respectively. In part (c), they were able to explain two features of the inner part of specimen X (gizzard). Furthermore, the candidates provided the correct reason for the absence of teeth in poultry in part (d). In part (e), they correctly explained how food reaches the gizzard from the beak. In part (f), they managed to enumerate the features that differentiate the digestive system of poultry from that of other farm animals. In part (g), the candidates were also able to draw and label the diagram of digestive system of chicken correctly. This implies that the candidates had a good understanding of the chicken digestive system as shown in Extract 23.1.

03.	a) Objewid continte were sand particly.	
	b) Used for ghirding and churching food materials.	
	<i>c</i>)	
	i) Preunce of muscles.	
	- The powence a murchs which an tough help to grind the	
	food materials.	
	•	
	ii) Precence a sond particles:	-
	- The prevence of sand in the inner part helps the grinding	
	and cruching of food material .	
L	d) fave giazard for gainding food particlus.	
<u> </u>		
	es the food particles reach specimen & from the beak through	
	pauling a unes of parts in digertino system, thus it is illustrated	
	Helow; fint in the following parts.	. <u> </u>
	1) Beak	
	- Boak is used for peck and break food materials.	
	». ()	
	- Vied for lumporary clorage of food.	
	- 1/10 softening of food with Water	

L	es iii, Proventiculus	
	- Used for cecterison of both hydroichlonz and papring.	
	in Thele North L	
	- Thus cruches and grinding child materials.	
	thorepare.	
	Book Crop Proventiculus Venticulus (specimen 1)	
	f)	
	is Beak - Und for peck and break food materials	
	ii) Crop - For temporary storage of food	
	- Also used for referring food with water.	
	(11) proventicular - Used for action of both hydrochlonic and	
	ivs Venticulus - Und for the cruching and aniholing food	
	majonal,	
	") Caeca - Used for digertion of cellulose by catalase.	
	Cellulase	
	The cardia spanning - ratification canta clon of musclus	
	time bundle of the loss upplied i	
	vi) Vont - Which holps facts as delivery of waste materials and	
	egg .	

Extract 23.1: A sample of the correct responses on question 3

In Extract 23.1, the candidate demonstrated a good understanding of the chicken digestives system by responding in all parts of the question correctly.

Data analysis shows that 9.2 per cent had an average performance in the question. Most of them managed to name and give the role of the observed content emptied on the watch glass in part (a) and (b), respectively. In addition, they were able to give the reason for the absence of teeth in chicken and enumerated the features that differentiate the poultry digestive system from that of other farm animals in part (d) and (f), respectively. However,

they failed to explain features of the inner part of specimen X in part (c). Some of the incorrect responses given were; *presence of folded muscles* and *network of blood vessels*. In part (e), they failed to explain how food reaches the gizzard from the beak. Most of the responses focused on the peristaltic movement of food the in human digestive system. In part (g), despite knowing the parts of the chicken digestive system in part (f), they failed to draw the system and label its parts appropriately. This signifies that the candidates lacked drawing skills and had a partial understanding of the chicken digestive system.

Further data analysis denotes that 0.6 per cent of the candidates had a weak performance in the question. In part (a), they were unable to name the observed content emptied on the watch glass by providing incorrect responses such as food material, soil and digestive juice. Consequently, in part (b), they failed to give the role of materials observed in part (a). Examples of the incorrect responses given were; for digestion, providing energy, transport food and help to survive. In part (c), they failed to explain the features of the inner part of specimen X. Hence, they provided incorrect responses like waste material, faeces, mucus membrane and muscle tissue. Moreover, the candidates did not manage to give the reason for the absence of teeth in chicken in part (d). The incorrect responses provided were such as swallow food without digestion, beak peak food and no reason to break the food. In part (e), they failed to explain how food reaches the gizzard from the beak. Examples of responses from one of the candidates were food store temporary in gizzard, it enter by high pressure, the food particle pass to the small intestine then to the crop as well as gizzard and poultry when poultry has eaten, food reaches soon to the gizzard. The candidates were also unable to enumerate the features that differentiate the chicken digestive system from that of the other farm animals in part (f). Their incorrect responses are such as it have urine, it have rapid digestion system undigested food is stored in the cloaca, they have microbial activities, they have chambers and they have ability to chew the curd. In part (g), they failed to draw and label the parts of the chicken digestive system. Some of the candidates tried to draw the chicken reproductive system instead of the chicken digestive system. Some named parts which were not for the chicken digestive system such as *mouth*, tongue, liver, gall bladder and pancrease. This is a justification that the

candidates lacked an understanding of the digestive system in chicken. Extract 23.2 shows an example of the incorrect responses in the question.

3. 0 The observed in the content is emotied 9122ard. Role of 6 material in part Observed 0 ta ÿ beaking Food. down 0 11 of Food substance. (\hat{C}) Cative of inner part of specimen X It's racht shald have a tavel .. ゆ hey

٢ 3 The teeth was not it have necessary because Help them for gizzard which a breaking d 20 and also m Food For grid pokin dasa Ø The Spermen X 芄 stored like those Temporan (NOD requirer Used in the for and notrients energiz. F i with 0 rue a Farn reaking dison seat while the ottn in directive system on oth in Farm four chamberd mach NI.JP Itn the not T. mach iv poultry Cir Aby animal ha C. stomach molex do farm an have a Runings addition Princrease which 0 10.00 tric Vi to For Temporan Auro a stomach. have Sperimen lagram OF X

Extract 23.2: A sample of the incorrect responses on question 3

In Extract 23.2, the candidate responded incorrectly in most parts of the question. In part (g), he/she wanted to draw the diagram of specimen X contrary to the demand of the question. The candidate provided correct responses in part (b), (d) and a few responses in part (f).

3.0 PERFORMANCE OF THE CANDIDATES IN EXAMINED TOPICS AND FIELDS

This section presents the analysis of the candidates' performance in different topics and fields. A total of 20 topics and 3 subject fields were examined in theory and practical papers, respectively. Data analysis shows that the candidates had a good performance in 16 topics and 3 fields, an average performance in 3 topics and a weak performance in 1 topic.

The topics and fields in which the candidates had a good performance were; Crop Science and Production (99.70%), Livestock Science and Production (99.4%), Crop Pests (99.00%), Pasture Agronomy (95.60%),Workshop Technology and Farm Structures (95.30%), Plant Diseases (92.60%), Farm Power (88.40%), Farm Mechanization and Machinery and Introduction to Irrigation (87.10%), Fundamental of International Trade and Farm Planning (83.60%), Plant Breeding (82.10%), Environmental and Technological Challenges in Agricultural Development (81.00%), Soil Science (79.20%), Introduction to Weed Science (78.80%), Livestock Reproduction, Breeding and Improvement (75.60%), Introduction to Animal Health (74.50%) and Introduction to Animal Nutrition (67.90%).

The candidates performed averagely in the topics of Introduction to Agricultural Prices (51.90%), Introduction to Soil Chemistry (49.80%) and Introduction to Soil Science (48.30%). However, they had a weak performance in the topic of Agricultural Production Economics (24.7%). The weak performance is attributed to a poor understanding of the concept of production function. The candidates' performance in the topics and fields in ACSEE 2022 is summarised in the Appendix.

Candidates' performance in different topics and fields in ACSEE from 2020 to 2022 was done based on the percentage of candidates who passed in each topic and field. The values in the table represent the percentage of candidates who scored an average of 35 per cent and above in the respective topics and fields in a particular year. The overall performance in a topic or field is the average of candidates' performance in that topic or field in the year(s) that was examined from 2020 to 2022. Candidates' performance in the topics and fields examined in ACSEE from 2020 to 2022 is summarized in Table 2.

S/N	Topic/Fields	Years' Performance in percentage		erage cent of didates Dassed	nments	
		2020	2021	2022	Ave Per can who	Cor
1.	Crop Science and Production (Paper three)		93.7	99.7	96.7	Good
2.	Livestock Science and Production (Paper three)	74.2	43.5	99.4	72.3	Good
3.	Crop Pests	90.4	2.5	99	63.9	Good
4.	Pasture Agronomy	55.9	64.7	95.6	72.1	Good
5.	Workshop Technology and Farm Structures	38.7	7.3	95.3 `	47.1	Average
6.	Plant Diseases	88.1	81.5	92.6	87.4	Good
7.	Farm Power	32.7	91.1	88.4	70.7	Good
8.	Farm Mechanization and Machinery and Introduction to Irrigation	33.4	58.2	87.1	59.6	Average
9.	Fundamental of International Trade and	39.3	21.8	83.6	48	Average
10.	Plant Breeding	75.3	52.9	82.1	70.1	Good
11.	Environmental and Technological Challenges in Agricultural	97.9	62.8	81	80.6	Good
12.	Soil Science (Paper three)	26	38.5	79.2	47.9	Average
13.	Introduction to Weed Science	59.2	92.1	78.8	76.7	Good
14.	Livestock Reproduction, Breeding and Improvement	74.4	72.8	75.6	74	Good
15.	Introduction to Animal Health	87.6	86	74.5	82.7	Good
16.	Introduction to Animal Nutrition	88.2	93	67.9	83	Good
17.	Introduction to Agricultural Prices	48.5	42	51.9	47.5	Average
18.	Introduction to Soil Chemistry	85	52.4	49.8	62.4	Average
19.	Introduction to Soil Science	67	49.7	48.3	55	Average
20.	Agricultural Production Economics	22	64.1	24.7	37	Average
21.	Agricultural Mechanics (Paper three)	70.5			70.5	Good

Table 2: Candidates' Performance in Topics and Fields in ACSEE from2020 to 2022

Source: ACSEE Agriculture CIRA 2020-2022

Table 2 portrays the candidates' performance in topics and fields in ACSEE from 2020 to 2022 in which on average, 12 topics and fields had a good performance and 12 topics an average performance. The topic of Agricultural Production Economics remains to be the last in the performance level in 2022 and average from 2020 to 2022.

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

This section presents the overall analysis of the candidates' performance in ACSEE in 2022 in Agriculture subject. The analysis shows that 100 per cent of the candidates who sat for the examination passed, of which 44.21 per cent scored high pass grades, while 55.79 per cent scored low pass grades.

The analysis of the candidates' responses shows that the candidates who scored high marks possessed adequate knowledge and skills of the subject matter. This enabled them to attempt the questions correctly and meet the requirements of the questions. On the other hand, low marks by some candidates are attributed to reasons such as some of the candidates had inadequate knowledge of the subject matter which led to the provision of partially correct responses in the questions. Moreover, they had inadequate practical skills which made them to fail to follow the procedures in the practical examination correctly. Therefore, they arrived at incorrect experimental results. The possession of laboratory and field practical skills could have helped the candidates to respond correctly in some of the questions in the theory papers. Furthermore, in some cases, the candidates either had misconceptions which made them to respond contrary to what was asked in the questions or failed to abide by the action verbs in the questions. This caused them to provide incorrect or inadequate responses in the questions.

4.2 Recommendations

This section presents the proposed measures to improve candidates' performance in future examinations based on the analysis made. The measures focus on improving the teaching-learning process to enhance students' learning. The education stakeholders particularly teachers are emphasized to use a variety of participatory teaching methods for teaching the subject matter. Based on the analysis, the following measures are recommended:

(a) The use of questions and answers in introducing and developing the lesson. For example, factors that influence the nutritional value and quality of farm yard manure in the topic of Introduction to Soil Chemistry can be exhausted in the questions and answers session. Questions stimulate creative and critical thinking of students. Further, they help the teacher to summarise the correct responses and the student to retain the material. The question session also maintains the student's focus and attention.

- (b) Conducting group discussions. This will increase the learning through sharing of ideas. For example, the relationships between the input used in the production and the output produced in the regions of production function curve in the topic of Agricultural Production Economics can be studied using this method.
- (c) Teachers should prepare and conduct field visit. This will increase students' knowledge and strengthen their observational skills. For example, a field visit to a prepared soil profile will facilitates students' understanding of the features of different horizons of the soil profile in the topic of Introduction to Soil Science.
- (d) Teachers should put more emphasis on the use of subject infrastructures such as demonstration plots, workshops and laboratories. This is based on the fact that students learn better by listening, seeing and doing. For example, soil structural grades and structural types in the topic of Introduction to Soil Science can be observed and appreciated in the laboratory. Laboratory work provides students with conceptual and theoretical knowledge.
- (e) Teachers should prepare and conduct educational tours. This will help students to appreciate the field of study more and supplement classroom teaching to enhance understanding. For example, problems that face farmers in marketing their products and solutions to the problems in the topic of Introduction to Agricultural Prices can be well learned through visits to Crop Marketing Boards and Marketing Cooperatives where experts help in delivering the subject matter.

Appendix

		2022			
S/N	Topic/Fields	Percentage of the Candidates who scored the average of 35% and above	Comments		
1.	Crop Science and Production (Paper three)	99.7	Good		
2.	Livestock Science and Production(Paper three)	99.4	Good		
3.	Crop Pests	99	Good		
4.	Pasture Agronomy	95.6	Good		
5.	Workshop Technology and Farm Structures	95.3`	Good		
6.	Plant Diseases	92.6	Good		
7.	Farm Power	88.4	Good		
8.	Farm Mechanization and Machinery and Introduction to Irrigation	87.1	Good		
9.	Fundamental of International Trade and Farm Planning	83.6	Good		
10.	Plant Breeding	82.1	Good		
11.	Environmental and Technological Challenges in Agricultural Development	81	Good		
12.	Soil Science (Paper three)	79.2	Good		
13.	Introduction to Weed Science	78.8	Good		
14.	Livestock Reproduction, Breeding and Improvement	75.6	Good		
15.	Introduction to Animal Health	74.5	Good		
16.	Introduction to Animal Nutrition	67.9	Good		
17.	Introduction to Agricultural Prices	51.9	Average		
18.	Introduction to Soil Chemistry	49.8	Average		
19.	Introduction to Soil Science	48.3	Average		
20.	Agricultural Production Economics	24.7	Weak		

The Candidates' Performance in Different Topics and Fields in ACSEE 2022