

P515/2
PRINCIPLES
AND PRACTICES
OF AGRICULTURE
PAPER 2
July/August 2012
3 hours



WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

PRINCIPLES AND PRACTICES OF AGRICULTURE

Paper 2

3 hours

INSTRUCTIONS TO CANDIDATES:

Answer Question 1 in section A and four other questions selecting one question from each of the sections B,C,D and E.

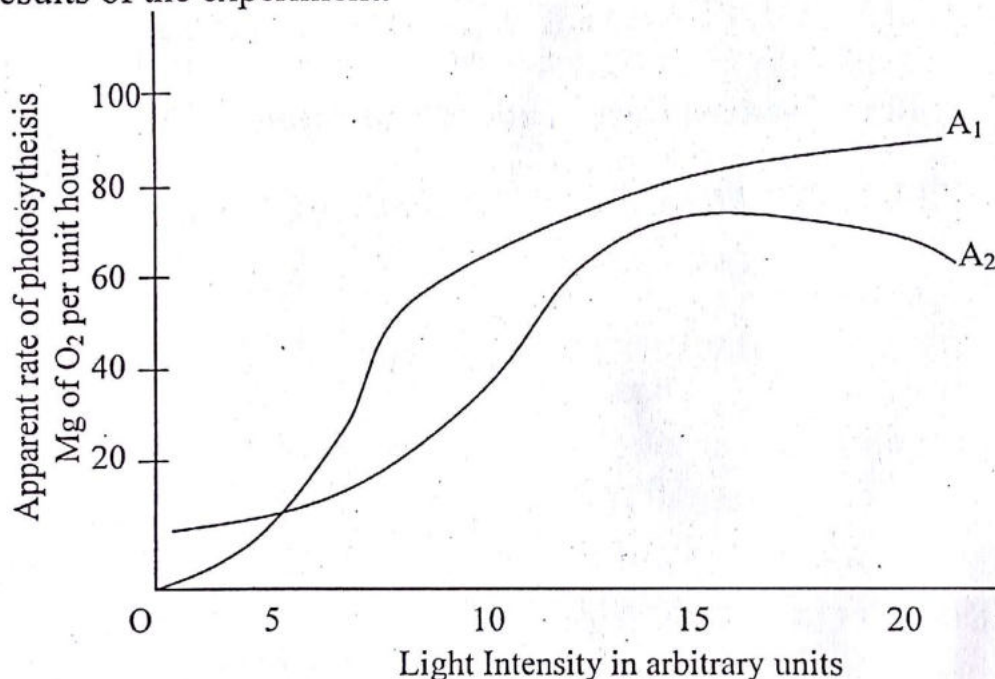
SECTION A

Compulsory Question (20Marks)

1. An experiment was carried to determine the factor affecting the rate of food manufactured by green plants.

A group of bean seedlings were divided into two groups A_1 and A_2 . Seedlings of group A_1 were grown under high light intensity (30 arbitrary units) and those of group A_2 were grown under low high intensity (8 arbitrary units).

When the plants were mature, their apparent rate of photosynthesis in milligrams of oxygen released per unit leaf area in hours were measured over a range of different light intensities. The figure below shows the results of the experiment.



- (a) From the graph, state the;
- Differences in the effect of light intensity on the two groups of plants. (04 marks)
 - Similarities in the effect of light intensity on the two groups of the plants. (02 marks)
- (b) Explain the difference stated in a (i) above. (04 marks)
- (c) Explain the pattern of the curve for the plants grown in low light intensity. (06 marks)
- (d) Suggest others factors which may limit the rate of photosynthesis of plants apart from light intensity if subjected to light intensity below 25 arbitrary units. (04 marks)

SECTION B (20 MARKS)

CROP PRODUCTION

2. a) Explain various considerations one should take when selecting good quality planting materials. (10 marks)
- (b) Describe how tongue grafting is carried out on an orange plant. (10 marks)
3. (a) What are the characteristics of an infertile soil? (8 marks)
- (b) Explain the factors that influence soil structural stability. (12 marks)

SECTION C (20MARKS)

ANIMAL PRODUCTION.

4. a) Give any six examples of feed additives with their benefits in livestock nutrition. (06 marks)
- b) A broiler bird consumed a total of 6kg of a feed during its 10 week life from hatching to slaughter. Its hatching weight of approximately 6gm was ignored. While at slaughter, it weighed 2kg. Calculate its feed conversion ratio. (04 marks)
- c) Explain the factors that a farmer would consider when formulating the poultry rations. (10 marks)
5. a) Describe the process of milk secretion and letdown. (10 marks)
- b) Explain various ways in which the quality of milk may be reduced. (10 marks)

Turn Over

SECTION D (20 MARKS)

AGRICULTURAL ENGINEERING

6. a) Describe the factors to consider when planning and designing farm building. (8 marks)
- b) Explain ways in which farm building improve farm production and management. (12 marks)
7. a) Describe the conditions that contribute to the development and use of machines in Agriculture. (8 marks)
- b) Explain the factors that have contributed to the limited use of ox-cultivation in Uganda. (12 marks)

SECTION E (20 MARKS)

AGRICULTURAL ECONOMICS

8. a) Describe various costs that an investor in any farming enterprise considers in order to maximize profits. (14 marks)
- b) Explain the ways how a farmer may reduce his fixed costs in order to maximize profits? (06 marks)
9. a) Explain the causes of Regressive labour supply curve? (10 marks)
- b) Describe the factors that determine the supply of labour in agriculture? (10 marks)

- END -

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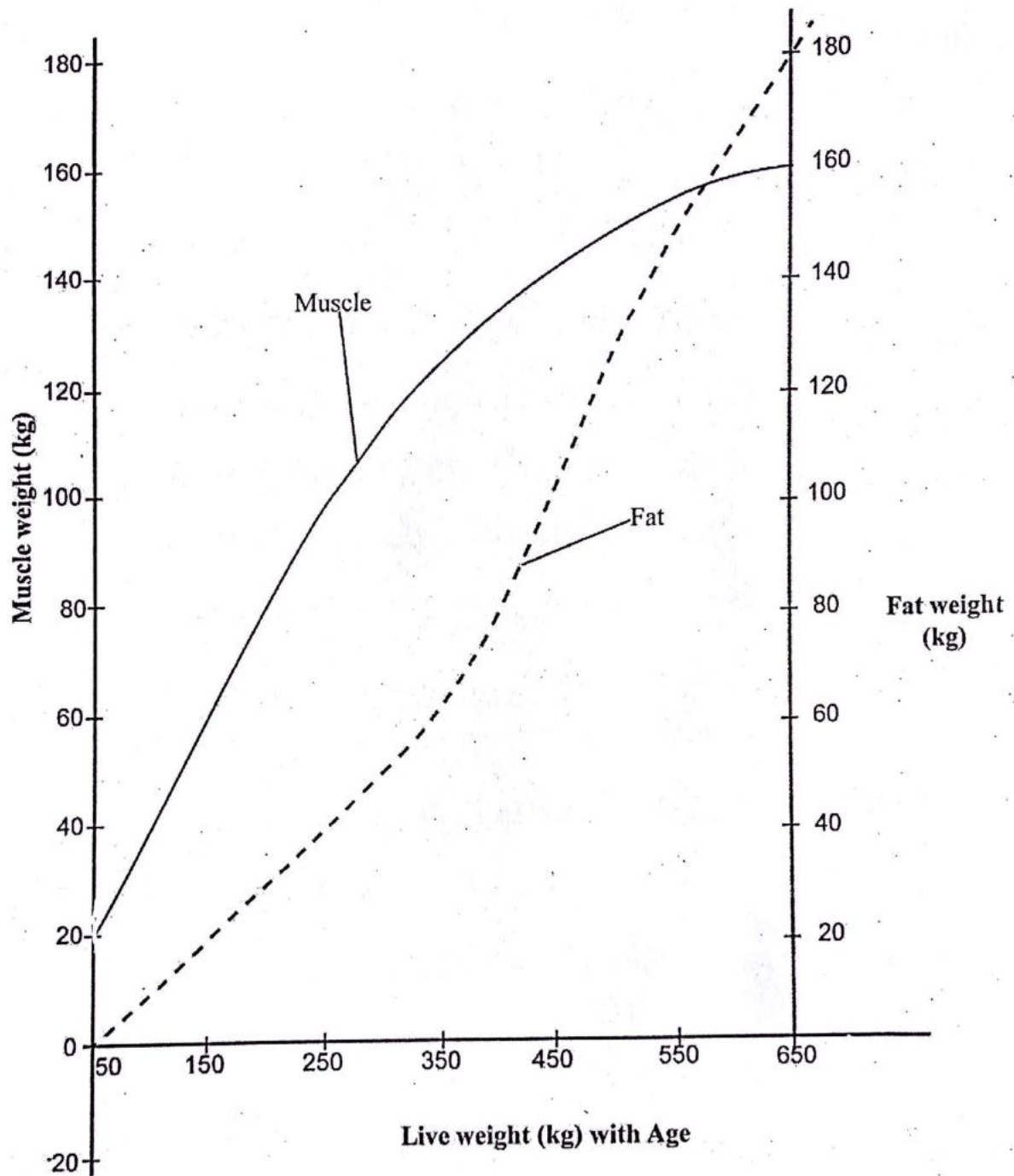
INSTRUCTIONS TO CANDIDATES:

Answer Question 1 in section A and four other questions selecting one question from each of the sections B, C, D and E.

SECTION A

Compulsory Question (20Marks)

The graph below shows the weight of muscle and fat in relation to live weight in a growing steer.



1. (a) Describe the variation of the curves for;
 - i) muscle (02 marks)
 - ii) fat (02 marks)
- (b) Explain the shapes of the curves for the muscle and fat in relation to the live weight of the steer from the graph; (08 marks)

- (c) At what live weight will the steer be when the;
- i) Muscle weight is 100kg (01 mark)
 - ii) Fat weight is 20kg (01 mark)
 - iii) Fat weight is 100kg (01 mark)
 - iv) Muscle weight is 90kg (01 mark)
- (d) Explain the factors which influence feed intake in steers. (04 marks)

SECTION B (20 MARKS)

CROP PRODUCTION

2. a) Explain the cultural practices that can be used to improve water use efficiency in crop production. (10 marks)
- b) Describe the physical methods of soil conservation. (10 marks)
3. a) Explain the factors that influence germination efficiency of crop seeds. (10 marks)
- b) Briefly describe how you would carry out a viability test for a seed lot using tetrazolium salt solution. (6 marks)
- c) What is the significance of seed dormancy. (4marks)

SECTION C (20MARKS)

ANIMAL PRODUCTION.

4. a) Explain how different off flavours arise in milk? (08 marks)
- b) Describe the different forms of processed milk. (12 marks)
5. a) Explain the considerations made when choosing a good animal for beef production? (12 marks)
- b) What factors may make meat unfit for human consumption (05 marks)
- c) Outline the essential features of a good Abattoir (03 marks)

Turn Over

SECTION D (20MARKS)

AGRICULTURAL ENGINEERING

6. a) Describe the pre requisites for selecting the farm power source. (06 marks)
- b) Enumerate the factors that influence the working efficiency of farm implements. (06 marks)
- c) Suggest how you would prepare a farm tractor for a day's work. (08 marks)
7. a) Describe the essentials of a good spray race for tick control at a modern farm. (12 marks)
- b) Outline the advantages and disadvantages of using a spray race at the farm. (08 marks)

SECTION E (20 MARKS)

AGRICULTURAL ECONOMICS

8. a) What are the different types of efficiency standards used in farming (04 marks)
- b) Explain the factors that determine efficiency in farming? (12 marks)
- c) Outline the objectives of using efficiency standards on the farm. (04 marks)
9. a) Outlines the characteristics of Agricultural produce that make their marketing difficult. (08marks)
- b) Explain how farmers can increase on the supply of Agricultural produce. (12 marks)

- END -

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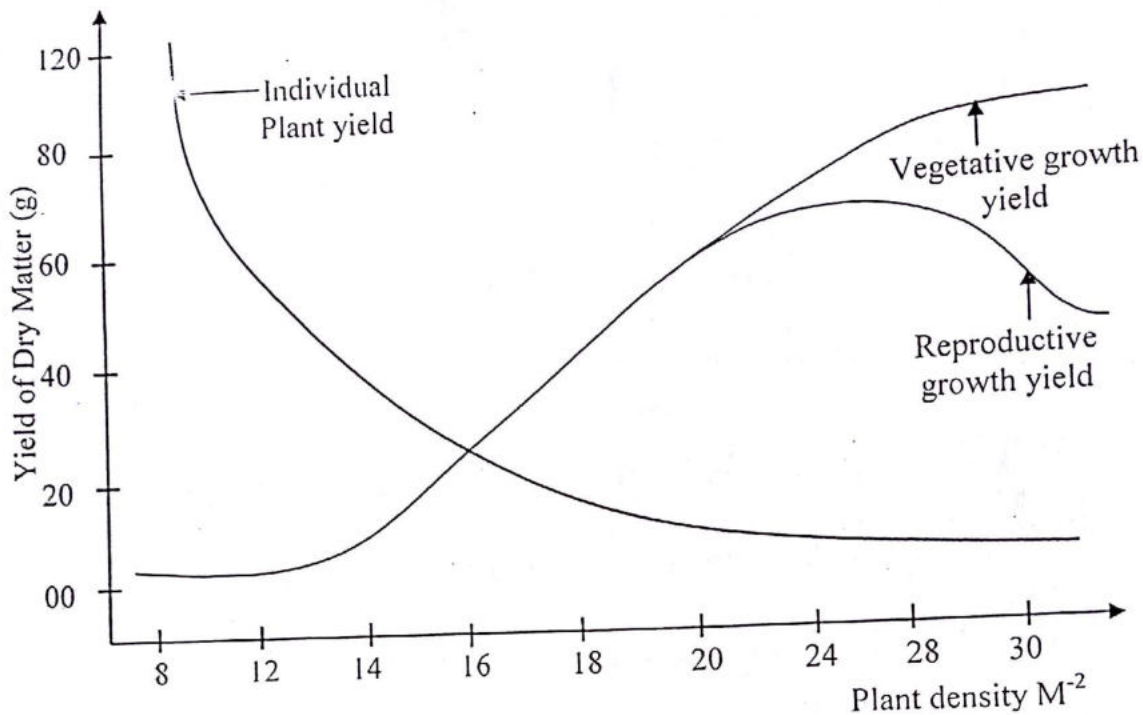
Answer Question 1 in section A and four other questions selecting one question from each of the sections B, C, D and E.

Any additional questions answered will not be marked.

SECTION A

Compulsory Question

1. The graph shows the effects of plant density on yields of dry matter (DM) for an individual plant and at vegetative and reproductive stages of a plant.



- Differentiate between vegetative and reproductive growth in plant (2marks)
- Describe how plant density affects yield of dry matter during vegetative and reproductive stages of plant growth. (6marks)
- Give an explanation for the observations made in (b) above. (3marks)
- Describe and explain the variation in the individual yield of the plants in the above experiment. (3marks)
- Apart from plant density, explain other environmental factors that could have played a part in the yield of dry matter in the plants above. (4marks)
- How does individual yield differ from vegetation and reproductive growth as far as plant density is concerned. (2marks)

SECTION B

CROPS PRODUCTION

2. (a) What desirable features make organic matter suit its roles in agricultural production. (8marks)
- (b) Explain the ways of increasing soil aggregate stability. (12marks)
3. (a) Outline the basic principles that should be followed when trying to raise a small seeded vegetable crop. (12marks)
- (b) Describe the procedure followed when transplanting a seedling. (8marks)

SECTION C

ANIMAL PRODUCTION.

4. At Kabonyolo farm, sows beyond the 1st parity were being fed 1.5kg /day /sow feed marsh for maintenance and 0.5kg for each piglet suckled.
 - (a) (i) How much feed was being fed to 15 sows with litter size 12 each during lactation period of 30 days. (4marks)
 - (ii) If the feed (kg) to water (litter) ratio was 1:2 wet feed to sows; how much water was required per day during the lactation period. (4marks)
 - (b) Suggest the reasons for mixing water with feed before feeding sows. (6marks)
 - (c) What will be the effects of not meeting the ratio requirements of sows and piglet during lactation. (6marks)
5. (a) Describe the predisposing conditions to livestock diseases on a farm. (12marks)
- (b) How can disease outbreak on the farm be reduced? (8marks)

SECTION D

AGRICULTURAL ENGINEERING.

6. (a) Distinguish between concrete and mortar as construction materials. (2marks)
- (b) Describe how you would use hand method to prepare good quality concrete on a farm. (12marks)
- (d) State reasons why floors of animal houses should be made of concrete. (6marks)
7. (a) Outline the safety rules for tractor operation. (6marks)
- (b) Suggest reasons as to why most farmers have failed to adopt tractors as a source of farm power. (08marks)
- (c) How can farmers be encouraged to adopt tractor use. (06marks)

SECTION E

AGRICULTURAL ECONOMICS

8. (a) What procedures should be followed when planning to set up a cooperative society in your area. (8marks)
- (b) How do coffee farmers benefit from being members of a cooperative union (CU). (12marks)
9. (a) Explain the causes of price instability for Agricultural commodities. (12marks)
- (b) Point out measures that can be taken to revert price instability in Uganda. (8marks)

- END -

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INSTRUCTIONS TO CANDIDATES:

- *This paper consists of sections A,B,C,D and E.*
- *Answer Question 1 in section A and four other questions selecting one question from each of the sections B, C, D and E.*
- *Any additional question(s) answered will not be marked.*

SECTION A 20 Marks

Question 1 is compulsory

1. An ecological field study was conducted on a small fresh water body located in the center of a thickly forested area. Measurements of some aspects of its biotic components were carried out for a duration covering one decade.
- (i) the population changes of the residing haplochromis fish species expressed in thousands.
 - (ii) the biomass of accumulated decomposing plant materials, expressed in thousands of arbitrary units. (a.u)
 - (iii) the depth of light penetration of water body in arbitrary units. (a.u)

The table below gives the results of average estimates made. Study the data and answer the questions that follow.

YEARS	0	1	2	3	4	5	6	7	8	9	10
No. of estimated Haplochromis fish ($\times 10^3$)	36	76	60	82	104	120	114	60	20	26	28
Biomass $\times 10^3$ (a.u)	100	86	70	64	72	86	102	94	60	50	50
Depth of light Penetration (a.u)	38	27	48	43	15	10	12	25	55	25	30

- a) Describe the changes in:
 - (i) number of Haplochromis (2 marks)
 - (ii) Biomass of accumulated decayed plant materials. (2 marks)
 - (iii) depth of light penetration covering the period of research. (2 marks)
- b) Explain the relationship between the Haplochromis population and:
 - (i) Biomass of accumulated decayed plant materials. (3 marks)
 - (ii) Depth of light penetration (2 marks)
- c) Describe how you would in two days estimate the population size of Haplochromis in that water body. (3 marks)
- d) Apart from light intensity, explain other factors that may affect the abundance of fish in their environment. (6 marks)

SECTION B (20 MARKS)

CROP PRODUCTION

2. (a) Mention the characteristics of a good pasture plant. (6marks)
- (b) Explain how you would maintain a balance of pasture species in a pasture range. (6marks)
- (c) Describe how a pasture can be conserved as silage (8marks)
3. (a) Discuss the influence of living organisms in soil formation process. (14 marks)
- (b) Explain the causes of soil acidity. (6 marks)

SECTION C (20 MARKS)

ANIMAL PRODUCTION.

4. (a) Explain how you would maintain a dairy farm free of ticks. (8marks)
- (b) Outline the procedure to follow in hand spraying cattle during tick control. (6marks)
- (c) Give reasons why farmers would prefer hand spraying their animals during tick control. (6marks)
5. (a) Account for the popularity of small ruminants production in the tropics (8marks)
- (b) Suggest the key setbacks to small ruminant production and their remedies in the tropics. (12marks)

SECTION D (20 MARKS)

AGRICULTURAL ENGINEERING.

6. (a) Describe the characteristics of a good livestock house (12marks)
- (b) Outline the factors borne in mind when designing a building for housing farm processing machinery. (8 marks)
7. (a) Describe the events that take place during the strokes of the compression ignition engine. (8 marks)
- (b) What makes tractors with diesel engines more suitable for farm use. (5 marks)
- (c) State the differences between the compression- ignition engine and spark- ignition engine. (7 marks)

Turn Over

SECTION E (20 MARKS)

AGRICULTURAL ECONOMICS

8. (a) What do you understand by the term *farm planning*? (2 marks)
- (b) Outline the objectives for carrying out a farm plan. (10 marks)
- (c) Explain why sometimes farm planning does not bring out the expected achievements. (8marks)
9. (a) With the aid of illustrations, state and explain the laws of supply and demand and explain the relationship between supply, demand and price. (8 marks)
- (b) Explain the factors that may lead to an increase in supply of Agricultural commodities. (12 marks)

- END -

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- *Answer Question 1 in section A and four other questions selecting one question from each of the sections B, C, D and E.*
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SECTION A

COMPULSORY QUESTION

1. On a dairy farm, a study was carried out on the feeding habits of a Friesian cow to determine the digestibility of four pasture species. The cow was given the same amount of each species at different times. The table below shows the amount of each species that was taken in and the amount of faecal material arising from each feeding regime. Study it and answer the questions that follow.

Pastures Species	Amount taken in (g)	Amount given out (g)
Digitaria macrobleshora	2340	2012
Pennisetum purpureum	350	200
Sporobolus pyramidalis	1175	675
Congo / Signal grass	1735	1485

- a) i) What is meant by feed digestibility (02 marks)
ii) Calculate the % digestibility for each grass species in the dietary requirement. (04 marks)
- b) Account for the difference in the digestibility of the above grass species. (04 marks)
- c) Explain what would happen to the dairy cow if it was kept exclusively on the pennisetum species diet. (05 marks)
- d) Suggest how best a farmer would improve intake for the grass species with the lowest digestibility. (05 marks)

SECTION B

CROP PRODUCTION

2. a) What is the importance of Mushroom growing among peri-urban farmers. (06 marks)
b) Explain the challenges of mushroom growing among peri-urban farmers of Uganda. (14 marks)
3. a) State the importance of soil water to crop plants. (06 marks)
b) Explain the measures farmers can take to improve on the water holding capacity of soils. (14 marks)

SECTION C

ANIMAL PRODUCTION

4. a) Describe the preparations farmers carry out on the brooder before receiving day old chicks. (12 marks)
- b) Explain the recommended disease preventive measures in poultry units? (08 marks)
5. a) Explain the factors that determine the stocking rate of fish in ponds. (08 marks)
- b) Describe the management practices that are carried out in order to maintain fish ponds. (12 marks)

SECTION D

AGRICULTURAL ENGINEERING AND FARM STRUCTURES

6. a) What are the reasons for providing housing for farm animals. (08 marks)
- b) Describe the desirable features of a good calf pens. (12 marks)
7. a) What factors determines the choice of farm machines to buy for farm use. (12 marks)
- b) Explain the various ways of ensuring efficiency of farm tools. (08 marks)

AGRICULTURAL ECONOMICS

8. a) What is meant by Marketing Functions? (02 marks)
- b) Explain reasons why marketing of agricultural product is still a big challenge in Uganda. (10 marks)
- c) Give reasons for carrying out the following marketing functions.
- i) Processing of products. (04 marks)
- ii) Storage of products. (04 marks)
9. a) What is meant by the term Gender gap in agricultural production. (02 marks)
- b) Identify the role of women/girls in agricultural production. (08 marks)
- c) Explain how the government of Uganda can increase womens' participation in agricultural production. (10 marks)

END