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WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
Uganda Advanced Certificate of Education
PRINCIPLES AND PRACTICES OF AGRICULTURE P515/2

July/August 2024



SECTION A	
COMPULSORY QUESTION (20 MARKS)	
1(a) Explain the variation in yields of the maize varieties above with planting density.	1 mark description, 1 mark explanation
As planting density increases, maize yield decreases in both varieties, this is due to increase in competition for growth factors such as air, water, minerals etc. Reduction in plant size leads to increase in maize yield from deco — produce less marks	4 X 1 = 4marks
(b) Apart from yield, explain two other agronomic attributes of maize that can be affected by planting density.	
<ul style="list-style-type: none"> - Reduction in leaf size and area. - Reduction in growth speed and vigor - Reduction in cob size. 	
(c) Basing on the data above, which variety would you recommend to a farmer with limited land?	1mark description, 1 mark explanation (2 marks)
<ul style="list-style-type: none"> - Variety A because it yields higher than variety B at all planting density. - - 	
(d) Explain how genetic factors could have influenced the difference in the performance of the two varieties.	5X 2 = 10 marks
<ul style="list-style-type: none"> - Genetic factors influence, mineral utilization, water use efficiency, disease and pest resistance, drought tolerance, grain size, number of grains per cob, number of cobs per plant and size of the cob. - - - 	1mark description, 1 mark explanation.
SECTION B	
2 (a) Highlight the advantages of using the following grazing systems.	
<ul style="list-style-type: none"> (i) Zero grazing <ul style="list-style-type: none"> - It requires a small area for the animals and permits keeping of animals even where the population pressure is high. - Fencing costs are limited. - Over grazing is avoided. - Bloat is avoided since pastures are first milled. wilted - It provides for good calf management. - It is easier to control parasites and diseases because animals do not mix with others. 	$4 \times 1 = 4 \text{marks}$

	<ul style="list-style-type: none"> - The shelter protects animals from bad weather. - Dung and urine are easy to collect and use for manning and biogas production. - Herbage usage is effective since they are first chopped. - Selective grazing and trampling of herbage are not experienced. - Extensive walking by animals in search for food and water is avoided. - Grass from distant fields can be made use of. - Supervision and monitoring is easy - Prefer record keeping is easy - 	
	<p>(ii) Rotational grazing.</p> <ul style="list-style-type: none"> - Allows uniform pasture utilization. - Selective grazing is avoided. - Minimizes build up of parasites and diseases. - Grass is grazed when it is at its highest value. - Cow dung and urine are well distributed throughout the field. - Grass is given time to recover. - Reduces the amount of labour needed to look after the animals and - soil erosion is avoided as and soil erosion is avoided as over grazing does not take place. - Proper - Prefer distribution of manure around the farm. - 	4X1 = 4 marks
(b)	<p>What strategies would you recommend to a farmer in order to maintain his pastures in a high state of productivity?</p> <ul style="list-style-type: none"> - Removal of all unpalatable and poisonous weeds. - Carrying out controlled burning to reduce the decayed layer of grass. - Deep plough the sports where new pastures are to be planted and apply manure. - Over sow with valuable grasses and legumes. - Even distribution of watering points to minimize over grazing at existing water points. - Paddocking to allow controlled grazing. - Irrigation during the dry season to encourage continuous growth. - Draining to control water borne diseases and parasites. - Fencing to ensure effective use of pastures. - Applying lime to reduce soil acidity and encourage microbial decomposition. - Spraying urea or molasses on pastures to make them more palatable. - Allow a section of good pasture to become standing hay to produce seeds for the next season. - Ensuring close herding or strip grazing to have uniform grazing but avoiding over grazing. - Control pests using recommended pesticides. - Dig down slash old pasture to allow regrowth. 	1X12 = 12marks

3 (a)	<p>Explain the contributions of the following mineral elements to crop growth.</p> <p>(i) Potassium.</p> <ul style="list-style-type: none"> - Vital in protein synthesis and utilization within the plant. - Helps in growth of root tips and terminal buds. - It strengthens straws or of crops and reduces lodging. - It is helpful in opening and closing of stomata. - It is useful in formation of chlorophyll and starch. - It activates enzymes. - It is essential in tuber development in Irish and sweet potatoes. - It increases resistance to diseases. - Helps grain to fill well (plumpness) - Regulates the use and availability of other nutrients. (N₂) - - - 	$4 \times 1 = 4 \text{ marks}$
	<p>(ii) Phosphorus</p> <ul style="list-style-type: none"> - It encourages formation, development and establishment of roots. - It is used in cell division and growth of plants. - Necessary during flowering, seeding and fruiting of crops. - Imparts disease resistance to certain crops. - Prevents lodging in cereals by strengthening stems. - Improves crop quality like leafy crops and cereal grains. - Formation of ATP molecules - - - 	$1 \times 4 = 4 \text{ marks}$
	<p>(iii) Nitrogen</p> <ul style="list-style-type: none"> - It helps in protein formation in plants. - Helps in chlorophyll formation. - It encourages vegetative growth. - It increases grain size in cereals. - It encourages leafy plants and fruits to become succulent. - It regulates absorption and use of phosphorous and potassium. - It increases crop quality and quantity of crop yields. - - - - 	$1 \times 4 = 4 \text{ marks}$
(b)	<p><i>Describe the procedure you would follow in order to obtain soil samples from a garden field for nutrient analysis.</i></p> <ul style="list-style-type: none"> - Obtain clean and complete tools or equipment to use. - Determine the area to be sampled. It should not exceed 5 hectares. - Choose the method to use. - Choose sites from which to collect the soil. - Clear all vegetation of the selected sites. - Collect samples from depth of about 15cm. 	$8 \times 1 = 8 \text{ marks}$ <i>Mark first 8 logical points</i>

Mix /	<ul style="list-style-type: none"> - Add all samples from the specific depth to make a composite sample. - Thoroughly mix the composite sample by breaking big... into smaller particle. - Sub-sample the composite sample and then obtain one kilogram to make a representative sample. - Make two labels for each representative sample with the relevant information. - Take the samples to the laboratory for analysis. 	
	<i>Chronological order</i>	

SECTION C
ANIMAL PRODUCTION (20MARKS)

4 (a)	<p>Differentiate between water intoxication and water turn over in the farm.</p> <p>Water intoxication is over hydration of the body tissues while turnover is the ratio of water lost to that which is replaced in the tissues/ is the rate at which an animals body water is replaced.</p>	block (2 marks)
(b)	<p>Explain the factors that influence water turn over in cattle.</p> <ul style="list-style-type: none"> - Nature of food. Proteins in foods make animals drink a lot of water since proteins produce a lot of urea which has to be removed from the body. - Physiological state of animals. More water is required during lactation and pregnancy. - Health conditions of animals. Sick animals require less water compared to healthy. - Environmental temperature. High temperature leads to high water intake. - Season. More water intake during dry season. - Exercise. More water is taken during exercise. - Metabolic water available within the animal's body. Less water will be taken if there is a lot of metabolic water in animal body. (<i>respiration</i>) - Age of the animal. Water requirement of the animal increases with age and reduces with old age. - Body size of the animal. Heavier animals require more water. - The salinity or the mineral content of water. Saline water ^{causes} or high-water intake. - Accessibility of water to the animals. Animals will take in more water if it is easily accessible. - <i>Higher temp: hot calls for less as well as low temp: low calls for less as well as</i> 	(6X2 = 12marks) (1mark, 1 Mark explanation)
(c)	<p>Outline the importance of water to farm animals.</p> <ul style="list-style-type: none"> - Gives rigidity to supporting tissues. - Acts as a solvent in the transport of nutrients. - Acts as a solvent in the removal of waste products from the body. - Provides a medium for enzymatic digestion and other chemical reactions taking place in the body of the animal. - It is useful for hydrolysis since it activates some chemical reactions. 	(6X1 = 6marks)

	<ul style="list-style-type: none"> - Maintenance of osmotic pressure in the body of the animals. - Aids in maintaining the PH of the body fluids within normal range. - It is a component of all the body fluids like blood, lymph. 	6X1@ 1 X 6 points
5 (a)	<p><i>Explain the conditions that can lead to low breeding efficiency in a herd.</i></p> <ul style="list-style-type: none"> - <u>Twinning</u> where twins are smaller. - <u>Free-martins</u> which are fertile <i>Inferile</i> - <u>White heifer diseases</u> which prevents penetration of penis into the vagina. <i>retains testicles in abdominal cavity</i> - <u>Cryptorchidism</u> which leads to failure of sperm manufacture. - <u>Infectious diseases</u> which lead to miscarriages. - <u>Retained corpus luteum</u> which prevent the cow from coming on heat. - <u>Cystic ovaries/nymphomania</u> which lead to prolonged heat period and no ovulation. - <u>Poor nutrition</u> which leads to low nutrients for fertility. - <u>Obesity</u> which makes mounting difficult for males and ovulation difficult in females. - <u>Lack of enough resting period</u> which leads to miscarriages in animals. - <u>Poor time of serving or mating the animal</u> which makes conception difficult. - <u>Silent heat periods</u> which make animals not mated. - <u>Age of the animal</u>. Old age leads to low breeding efficiency. - <u>Over use of the bull during mating</u> leads to release of young <i>mature</i> sperms or no sperms. - <u>Poor ratio of breeding males to females</u> which leads to some females not mated. - <u>Sucking of calves</u> causes delaying in occurrence of post partum heat and increases length of calving interval. - <u>Moving of long distances by bulls</u> reduces semen production and fertility in bulls. - <u>Failure to keep proper breeding records</u> makes monitoring of animals difficult. 	$(7 \times 2 = 14 \text{marks})$ <i>(1 mark point, 1 mark explanation)</i>
(b)	<p><i>Explain the influence of inbreeding in animal improvement programs.</i></p> <ul style="list-style-type: none"> - Creates animals with better capacity to pass on their traits to their offspring. - Reduces heterozygosity and increases homozygosity. - Leads to reduced yields and milk yields. - Leads to decline in viability/fertility of animals. - Leads to increased morality of offsprings. 	$(6 \times 1 = 6 \text{marks})$ <i>(1 mark point, 1 mark explanation)</i>

	<ul style="list-style-type: none"> - Leads to reduced diseases resistance. - Used in identifying undesirable traits and thus culling is done. - - - - 	
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SECTION D

AGRICULTURAL ENGINEERING AND FARM STRUCTURES (20MARKS)

6 (a)	<p>Explain the factors that influence the efficiency of field machinery.</p> <ul style="list-style-type: none"> - Level of maintenance. - Skills of the operator. - Soil conditions. - Vegetation cover. - Topography of the field. - Length of working hours. - Age of the machine. - Type of work - Weather conditions - 	8X1 = 8marks
(b)	<p>What factors should a farmer consider while purchasing a tractor for farm use?</p> <ul style="list-style-type: none"> - Ease of operation. - Adoptability to different tasks. - Versatility/ flexibility. - Cost of the farm tractor. - Power of the tractor. - Size of the farm. - Availability of spare parts. - Operating costs. - Efficiency of the tractor. - Durability of the tractor. - Guarantee of the tractor. - Ease of maintenance. - Ease of mounting implements. - Skills needed - Service Centres - Topography 	(6X2 = 12marks)
7(a)	<p>Using examples, explain the economic importance of farm structures.</p> <ul style="list-style-type: none"> - They reduce wastage and losses like crop store. - They protect feeds from bad weather like seed store. - Buildings protect animals from bad weather like chicken house. - Buildings protect animals from theft like animal house. - Buildings protect animals from parasites and diseases from outside animals like animal fences, kraals, stys. - Buildings ease management of animals like houses. (houses) - They minimize labour requirements like drying sheds/stores. - They protect crop produce from theft like crop store. 	(12 X 1 = 12marks) Example must

	<ul style="list-style-type: none"> - They protect crop produce harsh weather conditions like stores. - They protect crop produce from pests like crop store. - They protect crop produce ^{nature} for higher prices like crop stores. - They protect animals from diseases and parasites like fences, dips. - They protect farm tools and equipment from bad weather like workshop sheds, garages. - They protect farm tools and equipment from thieves like workshop sheds and garages. - They conserve farm water like dams, tanks, irrigation facilities. - They conserve soil by preventing soil erosion like drainage channels. - They ease movement and communications at the farm like farm roads. - They provide comfort to both man and animals like horses. - They increase the real estate value like buildings. - They ensure food security by keeping food like stores. <p><i>Some act as Commanding centre live offices</i></p>	
(b)	<p><i>Demands</i></p> <p>Describe the procedure of construction of a foundation for a typical farm buildings.</p> <ul style="list-style-type: none"> - Select a suitable site. - Take the required measurements. <i>size of the foundation</i> - Mark with pegs and strings. - Dig a trench of the required size. - Level the trench/ channels. - Put hard cores in the trench. <i>channel</i> - Put mortar or concrete to bind hard cores and level them. - Build foundation wall (plinth wall) - Put DPC on foundation wall. - Put bricks to raise the structure. 	<p><i>(8 X 1 = 8marks)</i></p> <p><i>logically (order)</i></p>

SECTION E

AGRICULTURAL ECONOMICS (20 MARKS)

8(a)	<p>Discuss the factors hindering the success of most agricultural policies and programs in Uganda.</p> <ul style="list-style-type: none"> - Lack of enough finance to implement it. - Lack of clear comprehensive policy frame work to guide the sector. - Duplication of duties by other organizations leading to disorganization. - Multi- sectoral approach makes collective decision making difficult. - It requires strong- cross- sectoral coordination & accountability. - Interferences from the politicians. - Lack of proper research into the actual needs of the policy consumers. - <i>Poor extension services</i> - <i>Corruption & embezzlement of funds</i> 	<p><i>(6 X 2 = 12marks)</i></p>
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(b)	<p><i>Examine the influence of land reform policy on the performance of the agricultural sector.</i></p> <ul style="list-style-type: none"> - To achieve high state or level of output. - Achieve flexibility of farming patterns so as to meet changing market demand. - Increases the productivity of both labour and land. - To achieve effective utilization of natural resources. - Encouraging production of the market as opposed to subsistence. - To encourage conservation and improvement of land. - To promote just and equitable distribution of land resources. - Facilitate the use of modern technology in farming. - Improve farmer's standards of living through large scale production. 	<i>(4 X 2 = 08marks)</i>
9 (a)	<p><i>Explain the strategies you would recommend to farmers in order to increase the rate of consumption for agriculture commodities.</i></p> <ul style="list-style-type: none"> - Lower the price of the commodities. - Find out the taste and preferences of the consumers in the community. - Improve the qualities of their produce. - Stop production of substitute produce. - Production of commodities that are acceptable to community. - Improve the level of advertising. - Market diversification. - <i>encourage co-operative practice</i> - <i>Enhance Marketing Market research</i> 	<i>(4 X 2 = 08marks)</i>
(b)	<p><i>Using an illustration, describe how the forces of supply and demand influence the equilibrium price.</i></p> <ul style="list-style-type: none"> - At low supply, (Q_1) there is excessive demand and increases of price P_1. - Excessive demand forces farmers to increase the supply to Q_2. - Excessive supply forces suppliers to lower their price to P_2. - Suppliers are forced to move their commodities from places where prices are low to places where prices are high. - Eventually a stage is reached when prices are almost the same everywhere. (equilibrium price.) <p><i>- At E.P it is equal to \$P_2\$ there they agree on the Price of the commodity.</i></p> <p><i>- Above E.P there is more \$S\$ and less of the higher price</i></p> <p><i>- Below the E.P there is more \$D\$ & less of higher price,</i></p> <p><i>The fewer sellers determine the price.</i></p>	<i>(4 X 2 = 08marks)</i>