**P515/2 AGRICULTURE**

**SECTION A-COMPUSOLY**

**1(a) Describe shape of the curve**

At the start rumen volume increased steadily up 20l, then the volume increases rapidly/exponentially/greatly up to 100L, after which volume increased slowly attaining a maximum above 140L at a live weight of 300kg, then the volume steadily declined up to125l at 560kg.

* Rumen volume steadily increases from 0-140, with increase in live weight in kilograms; it then becomes constant and decreases when it attains maximum.

(Award any 2 marks for correct description.)

(b) (i) - Volume of the rumen increase at the start due to growth of the buck, the decrease in rumen volume at maturity is due to development of the compartments in the gut.

Rumen volume increases as the young buck grows but then decreases as the buck approaches maturity due to the accumulation of internal fats

- This explains why voluntary feed intake reaches a maximum when bucks are about 80% of their mature weight.

(Award any 2points; corresponding to explanation@ 2marks, 2\*2 =04 marks)

(ii) (i) 160kg-126 litres

(ii) 90kg- 80 litres

(iii) 240kg-150 litres

(iv) 420kg- 145 litres

(Award 4 points, @ 1mark, 4\*1=04 marks)

(c) The most common form of dry matter found in the rumen is fibre.

(Award 2marks for correct response 2\*1=02marks)

**(d) Factors affecting voluntary feed in take in bucks.**

* Rumen volume; voluntary feed intake increases with increase in rumen volume.
* Physiological condition of the buck/heart of the buck/health of the buck
* Proportion of non fibre components;
* When voluntary feed intake increases, the proportion of non fibre components in the rumen also increase.
* Level of activity/activeness of the buck.
* Fraction/proportion of degradable fibre; this increase as the voluntary feed intake when its rate increases.
* Age of the buck
* The feed intake in bucks increases with increase in outflow of particles to the abomasum.
* Form in which the feel is offered/Nature of food.
* Type of feed (protein or carbohydrate feed)
* Physiological condition of the buck/Health condition/Heat period
* Size of the buck/weight of the buck.
* Level of activeness of the buck.
* Weather condition of the surrounding environment
* The amount of food present in the gut
* The form in which the feed is offered/Nature of the feed
* Breed of the buck/Genetic make up of buck.
* Palatability of feed/freshnes/odour/smell

(Award any 4points@ 2marks, 2\*4=08mark

Total for Qtn 1

02 +04+04+02+08= 20marks.

* Palatability of the feed/freshness/odour/smell
* Amount of food already present in the gut.
* Weather condition of the surrounding environment.
* Feed in take increases with increase of outflow particles to the abomasum.
* Size of the buck/weight of the back. 1 mark
* The breed of the back
* Type of feed e.g. protein Vs carbohydrate

**SECTION B. CROP PRODUCTION.**

**2. (a) Factors that may influence accelerated erosion.**

**- Rainfall intensity**

Heavy rainfall for even a short time results into rain off as low rainfall that drizels for a short time causes less erosion.

* **Vegetation cover**

The removal of vegetation cover exposes soil to agents of erosion because it reduces the rate of interception of rainfall drops on the land.

* **Land use practices/farming methods/practices**

Poor farming practices such as mono cropping, over grazing, bush burning expose land to erosion agents.

* Human activities like mining,construction,querying
* **Soil type and condition**

Soils with loosely attached particles like sandy soils are more easily removed/eroded than those with closely held particles like clay soils.

* **Topography of the land**

The steeper the land, the higher the speed of running water, the greater the soil carried away.

* Mechanization result to exposing a wide area to erosion agent/creates hard pans which hinders infiltration of water into the soil.

(Award 2 marks @ for any 4 points, 2\*4=08 marks)

**(b) Ways of arresting water erosion on steep slopes. (block money)**

- Afforestation;

Roots of trees bind soil particles together which makes soil resistant to surface runoff. Trees also reduce speed of wind.

* Practicing strip of cropping;

Crops are planted in rows running across the slope along the contour, these provide good cover to soil.

* Deep ploughing;

This breaks down hard layers within the soil so as to increase infiltration of water into the soil.

* Crop rotation;

Vegetation cover/crops protects the soil from erosion by reducing the impact of rain drops onto the soil, increase organic matter content of soil that birds soil particles together.

* Construction of diversion channels
* Mulching;

Mulches act as a barrier of rain drops, surface runoff, mulches also reduce evaporation of water from the soil.

* Planting cover crops whose leaves intercept rain drops and reduce velocity of rain drops.
* Application of manures;

Manures bind soil particles together reducing effect of surface run off.

* Use of grass ships;

A narrow band of grass is planted along the contour to trap/ reduce speed of running water.

* Terracing;

Terraces provide an outlet that can safely dispose off excess water that can not be absorbed by the field.

* Contour ploughing/construction of contours
* Use of stone lines/ trash lines;

Stones/trash put across the slope checks the speed of running water.

* Afforestation/re-afforestation
* Use of Absorption banks;

These catch and retain running and later used for other purposes like irrigation.

* Use of porous dams/Gabions

These encourage sedimentation of soil leading to filling up of gullys.

(Award any 8points @1 ½, 8\*1 ½ =12marks)

**3(a) (i) Propping/starking**

Is the provision of extra support to heavy fruiting crops using a “Y” shaped poles e.g- Bananas.

(ii**) Trellishing;**

Is the support given to plants with tender weak steams e.g. - passion fruits.

**(iii) Training;**

Is the bending of tender/ upper and softer parts of the plant with a tendril towards a given direction for support e.g- Beans

**(iv) Earthing up**

Is the covering of exposed plants with soil due to effect of erosion e.g.-cassava, Irish potatoes.

(Award 2marks for @correct definition 2\*4=08mark.)

**(b) How to raise coffee seedlings from nursery up to transplanting**

* Pick seeds from high yielding healthy trees
* Process and dry them in a shade.
* Choose a suitable site with good deep fertile soils which are well drained and a way from the shade.
* Dig a nursery bed to a depth of 60cm to a fine tithe remove stones, plant roots, weeds and level it.

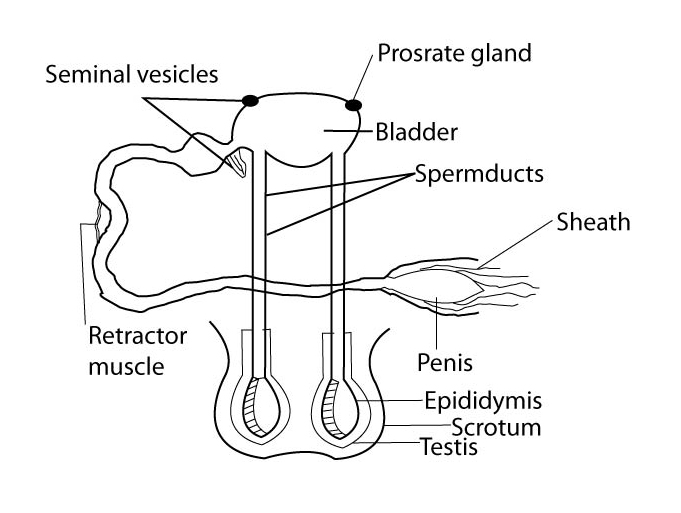
-Incorporate well decomposed manure or phosphate fertilizer.

* Plant seeds in rows spaced 15\*15cm 0r 20\*20cm

Apply full shade for at least one month.

* Water regularly if necessary.
* Early weeding should be practiced.
* Timely thinning/ picking out to avoid completion.
* Control pests and diseases by spraying.
* Harden off the seedlings before transplanting.
* Prepare seed bed early by removing all weeds, tree stumps at least 6 months before transplanting.
* Dig holes 3 months before transplanting i.e. 60\*60cm.
* Fill holes with top soil/ DSP fertilizer or manure 2-3weeks before transplanting.
* Transplant in the evening or under cool conditions preferably at beginning of long rain season.
* For robusta coffee space 3\*3m while 2.4\*2.4m for Arabica coffee.
* Provide shade to newly transplanted seedlings until they are properly rooted.
* (Award any 12points in logical order @ 1 mark 12\*1=12 marks)

**SECTION C ANIMAL PRODUCTION.**



1mark- diagram

5marks- Any 5 correct labeled parts

Total 6marks on diagram

**Function of any for parts**

* Testis

-Produce spermatozoa.

-they secret male sex hormones.

* Penis

-For mating (convey semen to the female tract.

- Used for passing out urine.

* Epididymis

-sperms mature here/ undergo development

* Sperm duct

-Convey spermatozoa/ semen to the accessory glands.

* Accessory glands

-Cowpers glands, - produce a liquid which neutralizes urine in the urethra and protects sperms from damage.

* Prostate glands

-they secret seminal fluids in which sperms mix to form semen.

* Seminal vessical

- Produce acids, enzymes and sugars to ensure that sperms can remain viable.

(Award any 4 parts@ 2marks, 4\*2= 08marks)

Total for Qtn 4a= 6+08=14 marks

**(b) Role played by different gonadolophin hormones.**

* Follicle stimulating hormones (FsH)

-stimulate rape growth of follicles in ovary.

* Lutenising Hormone (LH)
* Causes ovulation to occur
* Causes formation of corpus luteum.
* Prolactine

-induces rapture of mature follicle for ovulation.

(Award any 2marks@ 3 hormones 3\*2 =06 marks)

TOTAL 14+ 6=20marks

**5(a) Factors for loss in quality of hides and skills**

Solution

* -External parasites like ticks which bite and damage the skin and hides during life time of the animal.
* Physical injuries such as scratches from barbed wire fences, thrones which reduce quality of hides by piercing them.
* Diseases such as ring worms, mauge and small pox which spoil skins and hides and reduce their quality. Leakage in the root storage structure
* Flaying cuts which reduce value of hides.
* Pests like warble flies damage hides and skins by boring them while in stores.
* Improper bleeding provides a medium for bacteria leading to rotting of hides skins.
* Poor casting of animal e.g. - poor throwing on a rough surface which lead to scratches.
* Pulling/dragging the carcass over a rough surface which damages the hides.
* Poor branding practices which reduce value of the desired pails of hides and skin.
* Improper feeding/poor nutrition which lead to low quality of skins and hides/staining the hide/skin.
* Poor roping practices inflict damage and lead to poor ropes, Delayed flaying leads to carcus stiffing (rigermotis) hence poor flaying.
* Bruises during transportation that result into blood clots.-soiling the hide/skin due to poor slaughtering ground.
* Excessive drying,hide/skin causes crucking of skin/hide.

Award any 8 points @1 ½ mark, 8\*1 ½ =12marks

**(b) How to revert the above factors**

Solution

* Keeping animals in paddocks which reduces damage bushes and bruises.
* Transporting animals in well designed vehicles that reduce bruising of hides.
* Weeding the farm to remove thorny plants that damage hides and skin.
* Using plain wires fences and woven wire fences which do not have barbs that damage hides.
* Proper branding practices by only choosing recommender parts like fore head, tail etc.
* Ensure proper bleeding by hoisting the animals to reduce blood in the hide.
* Proper flaying of carcass immediately after slaughter before blood clots in the veins of hides.
* By eviscerating the carcass properly to reduce contamination with dung.
* By flaying from a clean area/ Abaltoir.
* By casting animals on grass surface to avoid damage.
* By dehorning cattle to reduce damage during fight.
* Use of shark knives but not pointed to reduce cuts on hides.
* Proper feeding/of animals
* Control of external parasites
* Proper drying method (fame) timber to avoid uneven drying.
* Control of the storage pests by spraying/dusting.

Award any 8 points @ 1mark 8\*1=08 marks

TOTAL 12+08=20MARKS.

**SECTION D- AGRIC ENGINEERING.**

* **Accept precautions before tractor operations as well.**

**6(a) safety rules for tractor operation.**

* Check the level of fuel.
* Do not get on or off tractor when it is moving; wait until it stops.
* Do not clean / grease when a tractor engine is in motion.
* Do not allow other persons to ride on the tractor during operation.
* Do not remove/ fit the belt to the pulley when tractor is in operation.
* Avoid removing the radiator cap when water is still very hot.
* Do not re-fuel the tractor when the engine is running.
* Do not use clutch pedal as a foot rest.
* Do not operate a tractor that has week brakes, low oil levels, improper tyre pressure.

Award any 8 points @ 1 mark, 8\*1=08 marks.

**(b) Reasons why most farmers in Uganda have failed to adopt tractor power.**

* Most farmers have small scattered plots of land which cannot economically benefit them when they adopt tractors.
* Lack of enough capital to buy /hire tractor services since most farmers are subsistence in nature.
* Nature of crops grown as most farmers grow crops which cannot be mechanized e.g. - coffee harvesting, cotton, Banana pineapple etc.
* Insufficient works on the farm as machines lie idle for most parts of the year when there’s no work on the farm that makes them to depreciate fast.
* Topography in some parts of Uganda especially farmers who own steep areas cannot think of tractor adoption.
* Lack of enough skilled labour, most farmers do lack knowledge of using tractors hence low adoption.
* Inadequate servicing and mentainace facilities as most farmers come from remote areas.
* Lack of enough extension services to encourage tractor adoption to farmers.
* Nature and condition of the soil
* Poor transport and communication infrastructure which makes it difficult for farmers in remote areas to receive information in tractor services e.g. tractor hire services.
* Pressure of cheaper and other alternative sources of power makes farmers reluctant at adoption of tractor services.
* Land fragmentation
* Conservative behavior of some farmers as they remain adamant to change their traditional beliefs and values. E.g. in Karamoja region most farmers have not been attaching much value to use of machinery.

Award any 6 points@ 2 marks, 6\*2=12 marks.

Total 8+12=20 marks

**7(a) (i) Replerushing the dip.**

-To avoid accidents of animals breaking their limbs

- To increase concentration of the accaricide.

**(ii) Stripping**

* Prevent excessive foiling and sedimentation
* Maintain the right concentration of the dip w ash.

**(iii) Watering animals before dipping process;**

* To prevent animals from consuming the dip wash when still thirsty.

Award 2 marks@ reason (practice) 2\*3=06 marks

**(b) Procedure followed while dipping cattle**

* Animals are assembled at collecting yard
* Animals are watered; given drinking water before going to the dip.
* -3-5 animals are run into the dip to mix the accaricide and are brought back for 2nd dipping.
* Animals enter the dip in a single file and step in foot bath to clean off mud from their hooves.
* From the foot bath, they jump into the dip tank con taining accaricide.
* Animals come out of dip tank through the exit rump.
* Animals are retained at the drainage race, to allow excess accaricide to drip off their bodies.
* When accaricide dips off their bodies, they are allowed to go for grazing.
* Weather condition
* Outime of dipping
* Degree of infestation
* Presence of the ticks
* Physiological status of the animal

Award 8 points @ logically presented @ 1mark 8\*1= 08 marks

**(c) How to improve the efficiency of dipping;**

* Provide water in the foot bath before dipping.
* Animals to be dipped should be watered first.
* Dip in a cool morning of sunny day.
* Ensure the concentration of the dip wash/ accaricide.
* Ensure the roof of the plunge dip is leak proof to prevent dilution of accaricide.
* Always open the drainage pipe/ return pipe during dipping process and close it after dipping.
* Always carry out dip testing to know whether concentration of dip has reduced and replenish immediately.
* Stripping should be done periodically.
* Dip all animals at the farm.
* Dipping should be done on regular basis/ as a routine practice.

Award any 6 points@ 1 mark, 6\*1=06 marks.

Total 06+08+06=20 marks.

**SECTION E- AGRIC ECONOMICS**

8. Balance sheet for Mr. Boona’s mixed farm as at 31st Nov. 2008

(a)

|  |  |
| --- | --- |
| LIABILITIES | ASSETS |
| Debts payable 600,000 | Debts recievable 860,000 |
| Bank over draft 966,000 | Promisory notes 105,000 |
| Depreciation 694,000 | Cash at bank 72,000 |
| Interest on loan 947,000 | Prepaid expenses 890,000 |
| Long term loan 850,000 | Insurance 28,500 |
|  | Value of sheep 365,000 |
|  | Value of maize 51,200 |
|  | Buildings 250,000 |
|  |  |
| TOTAL 4,057,000/= | 4,057,000/= |

Award 1mark for total liabilities

1 mark for total Assets

1 mark for Net deficit

1 mark for tittle.

Choose any 4 correct transactions on each side@ 1 mark, 1\*4\*2=08 marks

Total marks for part 8a) 04+08=12 marks.

**(b) Fixed assets.**

Insurance+ Building +Value of sheep

= 28500+250,000+365,000

= 643500/= (01 mark)

**(ii) Current liabilities**

Debts payable+ Bank overdraft + Interest+ Insurance

600,000+ 966,000 + 947000+ 28500

= 2,541,500/= (01 mark)

**(c) Benefits of balance sheet.**

* They enable farms to acquire loans as they show the worth of the business.
* They help in tax assessment.
* They help in planning and decision making
* They enable assessment of the value of the farm incase of sale
* They show the worthness of the business/profitability of the business.

Award any 4 points @ 1 ½ , 4\* 1 ½ = 06 marks

Total 12+2+6=20marks.

**9(a) Land tenure**

* Is a system that defines land ownership and possession of rights to use land.

Award 2 marks for an elaborate definition

**(b) Benefits of individual land tenure.**

* Encourage a farmer to improve his land.
* Land consolidation and farm planning becomes easier.
* It helps in demarcation to avoid inheritance disputes.
* The farmer can mortgage his land for a loan.
* If there are tenants on the land ,the landlord gets income from rent fees payed by tenants
* It safe guards the rights of ownership of the local community especially if land is in short supply.

Award any 4 points@ 2 marks, 4\*2 =08 marks.

**(c) Discuss how certain land tenure systems hinder agriculture development.**

* The would be land users are denied land by absentee landlords on mailo/ leased land which is hoarded.
* Tenants on mailo land have to pay rent which sometimes can be so high thus increasing cost of production.
* In some areas the tenants on mailo or leased land are not allowed to do certain permanent developments/ enterprises on the land e.g.- planting sugarcane, coffee, building farm structures etc.
* Tenants on mailo land can not use the land as security to secure a loan.
* Under customary land ownership it is difficult to fence or do personal developments on the land since it belongs to the entire community.
* Customary land is un registered hence it is not easy to heavy tax on such land by the government incase of existence of land tax
* Land fragmentation which discourages modern farming practices is so common in mailo land.
* Customary land tenure sometimes results into land conflicts which can lead to destruction of crops, animals lives etc.
* Individual land tenure land can be sold and bought at will hence tenants on such land can easily become landless depriving them their production potentials.
* Mailo land ownership
* Lease hold
* Public
* Cooperative landownership

Award any 5 points @ 2marks, 5\*2= 10 marks.

Total 2+8+10= 20 marks

**END**