

KIRINYAGA CENTRAL SUBCOUNTY JOINT EXAMINATION - 2015
443/1 AGRICULTURE PAPER 1 MARKING SCHEME

1. This is a farming method that involves growing crops keeping livestock and growing trees on the same piece of land. (Mark as whole) 1 x 1
2.
 - Provides market for industrial goods.
 - Provides raw material for industries.
 - Provides capital to start or expand industries. (2 x ½ = 1mk)
3. Intercropping is growing of different crops in the same piece of land at the same time while mixed cropping is growing of different types of crops in the same field at the same time but at different sections.
4. **Financial document.**
 - Invoice, receipt, delivery note, purchase order. (Mark as whole)
5. **Types of micro catchments.**
 - Triangular/V-Shaped/Negarims
 - Semi circular bunds
 - Trapezoidal bunds
 - Contour bunds
 - Planting holes (4 x ½ = 2mks)
6. **Sources of soil acidity.**
 - Water logging.
 - Over use of acidic fertilizer.
 - Acidic rain.
 - Plant nutrient uptake. (4 x ½ = 2mks)
7. **To attain high yields.**
 - Improve on the quality of bananas.
 - Helps to count banana weevil.
 - Crop reaches bearing stage early. (2mks)
8. Elasticity of demand = $\frac{Q}{P} \times \frac{P_1}{Q_1}$
$$Ed = \frac{(20 - 22)}{100 - 80} \times \frac{100}{20}$$
$$= \frac{2}{20} \times \frac{100}{20} = \frac{2}{4} = \frac{1}{2} \text{ or } 0.5$$
9. **Hybrid 614**
 - 1st no: 6 refers to the altitude in thousands of feet above sea level.
 - 2nd : 1 refers to the number of crosses.
 - 3rd no: 4 refers numbers to the serried number (2 x ½ = 2mks)
10. **Classification of pastures.**
 - Form in which it appears e.g. pure or mixed pasture.
 - Nature of establishment e.g. Natural or artificial.
 - Altitude at which the crop grows well and high altitude.
 - Medium of low altitude. (2 x ½ = 1mk)
11. **Properties of soil influenced by soil texture.**
 - Soil porosity/aeration.
 - Drainage.
 - Permeability, hence water retention capacity.
 - Capillarity, hence water distribution.
 - Stickers of the soil.
 - Cation exchange capacity hence soil PH. (4 x ½ = 2mks)
12. (i) **P.F (Production Function)**
This is the physical relationship between inputs and outputs in the production. (½mk)

(ii) **Equi marginal returns.**

States that if the amount of productive resources are limited they should be allocated in such a way that the marginal returns to those resource is the same in all alternative uses to which they are put. (½mk)

13. **Four practices used to improve permanent pastures.**

- Weed control/pest control.
- Topdressing with nitrogen/manure.
- Controlled grazing to avoid degeneration.
- Cutting back dry and unpalatable stumps. (4 x ½ = 2mks)

14. **Determinants of plastic pipes choice.**

- Durability.
- Size.
- Thickness.
- Cost.
- Colour of the pipe in rotation to the type of installation. (2 x ½ = 1mk)

15. **Advantages of tissue culture.**

- The plantlets developed maintain parental characteristics e.g. uniformity.
- Disease free plants are obtained.
- Mass production of planting materials.
- High yielding crop clones are produced. (4 x ½ = 2mks)

16. **Control of devils horsewhip mechanical means.**

- Digging up.
- Cleaning.
- Collecting and burning. (3 x ½ = 1½mks)

17. **Marketing functions involved in marketing of cabbages.**

- Buying.
- Selling.
- Assembling by traders or middlemen.
- Transportation to a large market/distribution.
- Sorting out/grading/standardize.
- Storage.
- Processing.
- Advertising/sales promotion
- Financing.
- Risk bearing.
- Marketing research. (4 x ½ = 2mks)

18. 20kg P₂O₅ contained in 100kg of SSP

$$40kg P_2O_5 = \frac{40 \times 100 \times 2}{20}$$

= 400kg of SSP
Method 1 x 1 = 1mk
Answer 1 x 1 = 1mk

19. **When opportunity cost is zero.**

- Free gift/donation.
- When there is no alternative.
- Unlimited supply.
- Commodity is inherited (3 x ½ = 1½mks)

20. **Steps of gulley formation.**

- Movement of water from the watershed.
- Erosion of the rills at the sides and bottom.
- Enlargement of rills width through further erosion.
- Further deepening of rills as a result of scouring of the channel floor by running water. (4 x ½ = 2mks)

21. **What is a partial budget?**

- Involves financial estimates representing an enterprise or enterprises changes for a short period of time in the farm. (1 x ½ = ½mk)

SECTION B:

22. (a) (i) Silica dish
(ii) Humus rich soil
(iii) Wire gauge
(iv) Tripod stand (½ x 4 = 2mks)

- (b) **Step followed in carrying out the illustrated experiment.**
- Weigh the silica dish.
- Collect garden soil from a depth of 20cm.
- Put the soil in the dish.
- Place the dish containing the garden soil over a (105°) in an oven for several hours.
- Cool the soil and weigh.
- Repeat the process until a constant weight is obtained.
- Place the dish with the soil over a source of heat. (½ x 6 = 3mks)
23. (a) Early blight. (1 x 1 = 1mk)
(b) Fungi (1 x 1 = 1mk)
(c) **Control measures.**
- Use of healthy or treated seeds.
- Use of fungicides.
- Field sanitation by removing and destructing of all crops remains from the pervious seasons.
- Planting resistance crops.
- Crop rotation.
24. (i) G – Cough grass.
H – Sodom apple. (1 x 2 = 2mks)
(ii) **Economic importance**
- Compete for resources with cultivated crops.
- It increases the cost of production.
- Lower the quality of pastures. (1 x 2 = 2mks)
(iii) It has deep underground structures difficult to remove, (1 x 1 = 1mk)
25. (a) **Compost manure.** (1 x 1 = 1mk)
(b) (i) **Ash** – Improves level of phosphorus and potassium.
(ii) **Top soil** – Introduces mirco-organisms necessary for decomposition.
(iii) **Manure** – Provide nutrients to micro-organism (nourishment).
(iv) **A stick** – To check the temperature. (1 x 4 = 4mks)

SECTION C:

26. (a) **Objective of Agricultural Research in Kenya.**
- Improve livestock production techniques.
- Develop improved crop varieties and animals breeds.
- Determine suitable ecological zones for various crop varieties and breeds that are resistant to parasites and field pests.
- Produce varieties and breeds that are resistant to parasites and field pests.
- Produce crop varieties and animals breeds that are tolerant to high temperature, poor pasture and drought.
- Produce early maturing crop varieties and animal breeds.
- Develop new techniques of pests and diseases control.
- Develop breeds and varieties that are highly adaptable to new environment
- Produce varieties that are highly yielding. (5 x 2 = 10mks)
- (b) **Cultural methods used to control pests.**
- Tillage – Expose pests to predators or sun killing them.
- Control of weeds – Break life cycle or destroys breeding places.
- Early planting – Minimizes attacks of crops.
- Burning of crop residue – Kills eggs and pests found in crop residue.
- Crop rotation – Break life cycle of pests.
- Use of clean planting materials – Minimizes pest population.
- Planting resistant crop varieties – Discourages breeding of pests.

- Closed season – Denies the pests its favourite crop.
 - Application of manure – Discourages some pests e.g. ell worm.
 - Proper pruning – Discourages breeding of some pests.
 - Timely harvesting – Crops escape attack.
 - Proper spacing – Discourages breeding of some pests.
 - Proper drying – Discourages attack by storage pests.
 - Growing of trap crop – Pests are trapped and destroyed.
 - Field hygiene – Destroys pest together with crop residue.
- (1 x 10 = 10mks)

27. (a) (i) Opening valuation is the monetary value of all the business assets at the beginning of an accounting period. (2mks – mark as whole)
- (ii) Closing valuation is the monetary value of all the business assets at the end of an accounting period. (2mks – mark as whole)
- (iii) A profit and loss account is prepared at the end of an accounting period. (1 x 1 = 1mk)

(b) (i) PROFIT AND LOSS ACCOUNT FOR KAGUMO FARM FOR THE YEAR ENDING 31ST DECEMBER 2003 ✓½

PURCHASE EXPENSE ✓½		SALE AND RECEIPTS ✓½	
PARTICULARS ✓½		PARTICULARS ✓½	
Opening valuation	80,000 ✓½	Vegetables sale	5,400 ✓½
Seeds and fertilizer	3,600 ✓½	Beans sale	20,000 ✓½
Machinery implement	60,000 ✓½	Milk to KCC	10,000 ✓½
Fuel	3,400 ✓½	Coffee sale	4,600 ✓½
Livestock	3,000 ✓½	Closing valuation	120,000 ✓½
Total purchases	150,000 ✓½	Total sales + Receipts	160,000 ✓½
Profit	10,000 ✓½		
	160,000		160,000

(½ x 20 = 10mks)
(1 x 1 = 1mk)

- (ii) The farm made profit.
- (iii) Profit = total sales and receipts – Total purchases and expenses
 = 160,000 – 150,000 (Working - 1mk)
 (Answer - 1mk)
 Total - 2mks

(iv) Percentage profit = $\frac{\text{Profit}}{\text{Total sales \& receipts}}$
 = $\frac{10,000}{160,000} \times 100$
 = 6.25%
 Working - 1mk
 Answer - 1mk
 Total - 2mks

28. (a) **Human factors influencing agriculture.**
- Level of education and technology – A more knowledgeable farmer produces high yields of high quality than an illiterate farmer.
 - Health/HIV/AIDS – Sick farmers are less productive.
 - Economy – Farmers with high capital goods produce more than a farmer with little capital.
 - Transport and communication – Good roads available easy transport of inputs and outputs hence high yield.
 - Market forces of demand and supply – the higher the demand the higher the produce and rise versa.
 - Government policy – Government may subsidize prices of inputs to encourage production.
 - Cultural and religious beliefs – Some cultures and religious beliefs may discourage or encourage production.
- (5 x 2 = 10mk)
- (b) **Factors to consider when choosing the planting time.**
- The onset of rains – Crops planted at the onset of rains establish early and make maximum use of rains.

- Weather conditions and harvesting time – Crops e.g. cotton, maize and wheat need a dry season for ripening and harvesting hence planting can be delayed for a while.
- Prevalence of pests and diseases crops planted early escape attack from pests and diseases.
- Soil moisture content – Right moisture facilitates germination of seeds and allows early crop establishment.
- Make demand off season – Vegetables are always planted late to target high market demand when there is shortage of food supplies.
- Type of crop to be planted,

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443/2 AGRICULTURE PAPER 2 MARKING SCHEME

1. (i) **Brooding** – Receiving of chicks from one day old up to 4 weeks in a brooder. (1 x 1 = 1mk)
(ii) **Flushing** – Feeding extra feeds of high quality to sheep two to three weeks before mating to increase chance of conception. (1 x 1 = 1mk)
2. **Advantages of carrying out raddling in sheep management.**
- To identify the sire of the lamb.
- To identify barren awes.
- To identify the infertile rams.
- To identify the most fertile ewes. (½ x 4 = 2mks)
3. **Compression ratio.**
The ration of the total amount of air in the cylinder to the amount of compressed air. (1 x ½ = ½mk)
4. **Dorper breed of sheep was developed from two breeds – namely.**
- Blackhead Persian. (½mk)
- Dorset horn (½mk)
5. **Physiological parameters used as indicators of ill health in livestock.**
- Abnormal pulse rate, low or high.
- Abnormal breathing (dyspnoca).
- Abnormal body temperature.
- Abnormal frequency of urination.
- Bloody urine (haemoglobinuria) (½ x 4 = 2mks)
6. **Factors considered when siting farm buildings and structures.**
- Wind direction. - Security of the area
- Topography/drainage of the area. - Government regulations.
- Accessibility of the area. - Room for future expansion
- Existing amenities i.e. electricity, water supply. - Relationship between the structures.
- Type soil. - Farmers preference. (4 x ½ = 2mks)
7. **Predisposing factors of:**
(a) **Coccidiosis.** (b) **Gumboro disease.**
- Wet litter (1 x ½ = ½mk) - Unhygienic conditions. (1 x ½ = ½mk)
8. **Light breeds of poultry.**
- Minorca.
- Leghorn.
- Sykes.
- Ancona. (½ x 4 = 2mks)
9. **Functions of water in the animal's body.**
- Water acts as a solvent for chemical substances.
- Medium of transport in the animal's body.
- Help to regulate body temperature through evaporative cooling.
- Help in maintaining solute – solvent balance in body fluids/osmoregulation.
- Help in excretion of waste products from the animal body.
- A component of body cells.
- Required in chemical reactions that take place inside the animal's body.
- Components of body fluids i.e. blood. (4 x ½ = 2mks)
10. **Functions of carburetor.**
- Introduces air and fuel.
- Atomises the fuel into tiny droplets.
- Regulates the air fuel ratio by use of the choke and throttle respectively. (½ x 3 = 1½mks)
11. **It is necessary to use a jembe instead of a plough.**
- When land is very steep.
- Lack of technical skills in operation of plough.
- When the size of land is small.
- When adequate time is available.
- When it is cost effective. (4 x ½ = 2mks)

12. (a) **Intermediate host for the following internal parasites.**
 (i) Tapeworm.
 (ii) Taenia saginata – cattle. (1 x ½ = ½mk)
 (iii) Taenia solium – pigs. (1 x ½ = ½mk)
- (b) **Effects of parasites on host.**
 - They transmit diseases.
 - They deprive the host animal of food.
 - They cause injury or damage to tissue and organs of the host.
 - Cause irritation and discomfort to the host animal.
 - Cause blockage or obstruction of internal organs.
 - Cause anaemia by sucking blood from the hosts.
 - Can lead to death of animal host.
 - Cause loss of appetite or excessive appetite. (4 x ½ = 2mks)
13. (i) **Epistasis** – A situation where different genes located in different chromosomes influence the outcome of another unrelated gene. (1 x 1 = 1mk)
 (ii) **Heterosis – (Hybrid vigour).**
 It is improved performance of the offspring that comes about due to mating two animals with superior characteristics. (1 x 1 = 1mk)
14. **Reasons for proper maintenance of farm tools and equipments.**
 - To avoid injury to the user.
 - To increase durability of the tool.
 - To increase efficiency at work.
 - To avoid cost of repair and replacement.
 - To increase their resale value. (4 x ½ = 2mks)
15. **Advantages of natural calf rearing.**
 - The calf gets milk at the right temperature.
 - Calf takes milk at its own pace.
 - Chances of milk contamination are reduced.
 - Low labour requirement.
 - It makes better use of difficult milkers. (4 x ½ = 2mks)
16. **Importance of timber seasoning.**
 - To prevent harping or bending of timber.
 - Controls insect damages.
 - Reduces fungal attack. (3 x ½ = 1½mks)
17. **Three functions of an egg shell.**
 - Give the egg its shape.
 - Prevent entry of diseases causing microorganism.
 - Allow for gaseous exchange. (3x ½ = 1½mks)
- SECTION B:**
18. (a) **Diagram.**
 M – Sickle
 N – Pruning saw
 P – Wood float
 Q – Mason’s trowel (4 x ½ = 2mks)
- (b) **Uses of tools**
 M - Harvesting crops i.e. rice, wheat etc.
 - Cutting grass, cutting back pyrethrum.
 N – P – Level or smoothen concrete and mortar
 - Hold mortar before it is placed in position
 Q – Laying on the mortar during construction (4 x ½ = 2mks)
- (c) **Replacing broken handles.**
 - Sharpening cutting edges.
 - Oiling when and before storage. (1 x 1 = 1mk)
19. (a) **The disease the animals was suffering from.** - Foot rot. (½mk)
 (b) **Possible cause of the above disease.**
 - Caused by bacteria called fusiforms nacrophorus. (½mk)
 (c) **Two farm animals by the above disease apart from cattle’s.**
 - Sheep.
 - Goat.
 - Pigs. (2 x 1 = 2mks)
 (d) **Four control methods of the diseases.**
 - Hoof trimming.

- Treat with antibiotics
- Isolate sick animals
- Avoid muddy conditions/hygiene
- Allow animals to walk in footbath of copper-sulphate.

(4 x ½ = 2mks)

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20. (i) The activity illustrated is hand milking.
 (ii) **Activities carried out on the animals before hand milking.**

(1 x ½ = ½mk)

- Restraining the animal.
- Providing dairy meal/milking feed.
- Washing the udder clean.
- Assembling the milk equipment.
- Wiping the udder dry.
- Testing for mastitis.

(3 x ½ = 1½mks)

- (iii) **The procedure of milking.**

- Assemble all the milking equipment
- Put the coat in the milking shed and restrain it appropriately.
- Wash the udder and teats using warm water mixed with a suitable sanitizing agent.
- Dry the udder using a clean towel.
- Use a strip cup to check for mastitis.
- Carryout milking of the animal, strip the udder dry.
- Dip the teat in anti-mastitis solution.
- Apply milking jelly/milk salve on the teats.
- Release the cow.

Any (6 x ½ = 3mks)

21. (a) **Digestible crude protein.**
 The percentage of the protein and animal is able to absorb from a feed.
 (b) Pearson square method of food compitition.

(1 x 1 = 1mk)

$Maize = \frac{15}{25} \times 100 = 120kg \text{ of maize } \checkmark \frac{1}{2}$
 $Sunflower = \frac{10}{25} = 80kg \text{ of sunflower } \checkmark \frac{1}{2}$

22. (a) **General methods of disease control in livestock.**
- Use of prophylactic drugs – Animals are given drug routinely to control certain diseases e.g. chicken are given.
 - Use of antiseptic and disinfectants: They contain germicidal chemicals e.g. elecauning poultry or calf pen with disinfectant help control certain diseases/maintain hygiene's.
 - Qualantino – during an outbreak of certain notifiable disease like foot and mouth disease. Livestock movement is restricted to avoid spread of diseases.
 - Isolation – Animals suffering from certain dangerous disease e.g. scours and brucellosis are isolated to prevent the spread of the disease to the healthy ones.
 - Mass slaughter/culling: Animals suffering from certain dangerous diseases e.g. zoonotic disease like anthrax should be slaughtered in mass to eliminate the disease.
 - Vaccination: Animals are usually vaccinated against certain diseases e.g. lumpy skin disease/black quarter.
 - Control of vectors – Diseases carrying parasites e.g. tsetse fly are controlled by spraying with appropriate chemicals or bush clearing to control diseases like nagana.
 - Use of healthy breeding stock/AI healthy breeding stock or use AI help to prevent breeding diseases like brucellosis.
 - Proper nutrition – well nourished animals are healthy and do not suffer from nutritional diseases like anaemia in piglets.
 - Drenching/control of internal parasite. Internal parasites may cause diseases.
 - Keeping resistant breeds of livestock. By keeping Zebu cattle occurrence E.C.F is reduced.
 - Proper housing – this prevent diseases like pneumonia.
 - Foot trimming – to minimize occurrence of foot rot.

(1 x 10 = 10mks)

22. (a)
- Marking boundary/border.
 - Keeps off thieves/intruders.
 - Prevent damages of crops by crops.

- Control grazing in paddocks.
- Control breeding by separating males and females.
- Live fences act as windbreak.
- Fences help to control pests and diseases by controlling wild animals.
- Add aesthetic value.
- Live fence may provide livestock feeds or human fruit or firewood.
- Add value to the farm.

(1 x 10 = 10mks)

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23. (a) **Principle of operation of four stroke cycle engine.**

(i) **Induction stroke.**

- The piston moves downwards in cylinder.
- This causes a partial vacuum on the upper part of the cylinder.
- The partial vacuum causes the inlet valve to open.
- The open inlet valve sucks in fuel and air mixture into the cylinder.
- The exhaust valve remains closed.

(ii) **Compression stroke.**

- The inlet and outlet valves remain closed.
- The piston moves up in the cylinder.
- The air fuel mixture is compressed in the cylinder.

(iii) **Power/ignition stroke.**

- The piston reaches the uppermost portion of the cylinder (top dead centre).
- The fresh air fuel mixture is fully compressed.
- The spark plug produces a spark.
- The spark ignites the fuel air mixture.
- The ignited mixture expands. The expansion creates pressure that forces the piston downward thus generating power.

(iv) **Exhaust stroke.**

- Piston moves up the cylinder.
- Exhaust valves opens.
- Exhaust gases are forced out.
- Inlet valves remains closed.

(10 x ½ = 8mks)

(b) **Rearing of fresh water fish.**

(i) Type of fish reared – Tilapia, carp, trout, black bass, stripped bass and lung fish/mudfish, cut fish. (2 x 1 = 2mks)

(ii) **Stocking of the pond.**

- Fingerings are obtained from reputable hatcheries.
- Water in this container should be 10°C.
- Care should be taken to avoid injury.
- Fingerings are introduced into the pond by lowering the container for them to swim out.
- Ensure the temperature of the pond water is the same as in the container.
- The stocking rate should be 5-10 fingerings per 5m² of the pond.
- Ensure the fingerings have enough food.

(6 x ½ = 3mks)

(iii) **Practices done to increase fish yield.**

- Provide fish with enough food/manuring the pond to ensure growth of plankton/algae.
- Ensure the correct stocking rate/cropping to remove mature fish.
- Harvest only the mature fish.
- Ensure the correct depth of water/control silting/plan grass on the enharkment to control erosion.
- Control predators/fish eating animals/provide fence around the pond.
- Ensure continuous flow of water/well created.
- Repair the broken/cracked walls/dykes.
- Clear the vegetation around the pond.

(4 x 1 = 4mks)

(iv) **Cropping of fish.**

- The removal of only marketable fish from the pond.
- Done using a sieve net of size 3 – 3.5cm.
- The small fish which pass through the sieve net holes are left in the pond.

(6 x ½ = 3mks)

24. (a) **General characteristics of beef cattle.**

- Adapt well to a wide range of ecological conditions.
- Feed requirement is low.
- Water requirement is low
- Can feed on a variety of vegetation.
- Are heat torelant.
- Are resistant to parasites and diseases.
- Can move long distances in search of water and pasture without lowering their performance.
- They breed regularly.
- Grow fast leading to early maturity.

- Blocky in shape.
- Short strong legs to support their heavy bodies.
- Efficient converters of food into meat and fat.
- Have deep well fleshed bodies.

(1 x 10 = 10mks)

(b) **Management practices of a deep litter.**

- Put litter to depth of 10cm.
- Raise the litter once a week to improve aeration.
- Ensure ventilation which should be 60 -70cm above the ground.
- Provide clean adequate water on the feed trough.
- Provide girt.

- Provide footbath at the entrance with a disinfectant
- Collect eggs thrice a day.
- Roof should be strong for security.
- Ensure there is no leakage
- Provide greens and hang them. (1 x 10 = 10mks)