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**CEKENAS END OF TERM TWO EXAM-2022**

**FORM FOUR EXAM**

*Kenya Certificate of Secondary Education. (K.C.S.E)*

***Agriculture paper 1***

***443/1***

***Marking scheme***

**1. Aspects of light**

- Light wavelength

- Light intensity

- Light duration (½ x 3= 1 ½mks)

**2. Factors which determine depth of ploughing**

- Type of crop/ rooting system of crop

- Type of implement available

- Type of soil

- Soil moisture content during ploughing time

- Presence of certain types of weeds e.g. couch grass

- Source of power (½ x 4= 2mks)

**3. Advantages of using farm yard manure instead of straight fertilizer.**

- Supplies a variety of plant nutrients

- Has a longer residual effect

- Promotes microbial activities in the soil

- It is locally/ easily available

- Moderates the soil pH/ increases aeration exchange capacity

- Farm yard manure improves soil structure/ improves soil water holding capacity. (½ x 4= 2mks)

**4. Methods of reclaiming land**

- Draining the land

- Controlling of soil erosion

- Irrigation

- Afforestation/ re- afforestation

- Control of tsetse flies (½ x 4= 2mks)

**5. Benefits of land consolidation**

-There is proper supervision of the farm

- Reduces costs on travelling

- Rotational program can be easily affected

- Mechanization is possible because the areas are large

-Easy to get extension services

- Allows good farm planning

- It enhances proper pests, diseases and weed control

- Encourages long term investments (½ x 4= 2mks)

**6. Factors that determine spacing of maize crops.**

- Soil moisture content

- Soil fertility

- Machinery to be used

- Intended use of the crop

- Prevalence of pests and diseases

- Cropping system used

- Number of seeds per hole. (½ x 4= 2mks)

**7. Factors affecting quality of hay**

- Stage at which the grass is cut/ harvested

-Efficiency in preparation / how well the grass is dried/ turned

- Methods of storage/ storage conditions

- Species/ type of forage crop/ nutritional composition of forage

- Length of drying period/ extent of drying
- Weather conditions during drying period (½ x 4= 2mks)

**8. Factors affecting effectiveness of a pesticide**

- Concentration of the pesticides

- Weather conditions during application

- Stage of development of the pesticide

- Rate of application of pesticide

- Mode of action of the pesticide. (½ x 4= 2mks)

**9. Types of crop records**

- Field operation records

- Crop production records

-Inventory records/ consumable goods inventory/ permanent goods inventory

- Marketing records

- Labour records (½ x 4= 2mks)

**10. Importance of agroforestry**

- Remedy for deforestation/ source of firewood

- Source of income when timber/ fodder/ poles/ fruits are sold

- Aesthetic value/ beauty

- Labour saving

- Environment benefits/ control soil erosion/ improve water retention/ enrich soil through leaf litter and nitrogen fixation/ improve water catchment. (½ x 4= 2mks)

**11. Characteristics of a good site for a nursery bed**

- Near a reliable water source

- Well drained area with deep fertile soils

- Gently sloping area

- Secure area

- Sheltered area

- Should not have been used for the same crop species in the previous season

- Should be accessible (½ x 4= 2mks)

**12. Methods of farming**

- Shifting cultivation

- Nomadic pastoralism

- Organic farming

- Mixed farming

- Agroforestry (½ x 4= 2mks)

**13. Natural factors that influence soil erosion**

- Amount of rainfall/ rainfall intensity

- Slope/ topography

- Type of soil

- Size of water shed/ catchment

- Length of the slope

- Vegetation cover

- Wind velocity/ strength of the wind

- Soil depth (½ x 4= 2mks)

**14. Conditions observed when harvesting cotton**

- Do not pick the lint when it is wet

- Pick on weekly basis

- Avoid dry twigs or leaves contaminating the cotton

- Do not use sisal bags to hold cotton as the sisal fibres may contaminate lint. (½ x 4= 2mks)

**15. Uses of water on the farm**

- For diluting/ mixing chemicals used to control pests, diseases, weeds

- For watering livestock e.g drinking

- Watering plants I.e. irrigation

- In processing farm produce e.g. coffee, carrots etc.

- Domestic use e.g. drinking, cooking

- For rearing fish

- Mixing concrete in construction

- Recreation e.g. swimming pool

- Cooling and running machine engines (½ x 4= 2mks)

**16. Types of surface irrigation**

- Furrow irrigation

- Basin irrigation

- Flood irrigation (½ x 3= 1½mks)

17. Pollarding is cutting the branches and the tree crown.

Coppicing is cutting main stem completely at a height of 30cm above the ground. (1x1= 1mk)

**SECTION B**

18. a) M – Trelishing

N – Propping

**b) Reasons for carrying out practice M**

- Enhance production of clean fruits/ improves quality of fruits

- Help in controlling diseases

- Facilitates spraying/ harvesting of the crop

- Prevents infestation by soil borne pests (1x 3= 3mks)

**19. a) Identity of weeds**

R – Mexican Marigold

S – Bristly fox tail / love grass

T – Witch weed/ Striga spp

U – Double thorn (½ x 4= 2mks)

**b) Reasons why weeds S and U are difficult to control.**

S – Easily dispersed by animals

U – Has thorns which injure the workers. (1 x 2= 2mks)

**c) Why R is not suitable on dairy animals**

- Taints the milk (½ x 1= ½mk)

**d) Which weed is parasitic to cereals?**

- T (½ x 1= ½mk)

20. a) **Type of silo** – Trench Silo (1 x1 = 1mark)

**b) Use of part M and N**

M – Prevents entry of water into the silage

N – Drains away water (1x 2= 2mks)

**c) Ways of ensuring anaerobic conditions during silage making.**

- Fast filling of silo

- Proper compaction

- Sealing with polythene paper and soil. (1x 2= 2mks)

**21. a) Soil structure X and Y**

X – Platy soil structure

Y – Blocky structure (1 x 2= 2mks)

**b) Soil structure not suitable for growing maize**

X / platy structure (1x 1= 1mk)

c) Methods of improving soil structure

- Add organic matter/ organic manure to the soil/ F.Y.M/ Compost manure.

- Add liming materials / Calcium Ammonium Nitrate

**SECTION C**

**22.a) Overcoming risks and uncertainties**

- Diversification of enterprises to avoid total loss

- Insurance against losses- for compensation in case of failure.

- Inventory marketing/ strategic farming keeping farm product and selling at when prices are favourable

- Flexible enterprises- engaging in enterprises that can be stopped or changed

- Rationing of inputs – use of sufficient inputs such that losses are not too high

- Contract farming – making arrangements with marketing agencies in advance to cater for price fluctuations

- Selecting more certain enterprises – selection of enterprises that do well in the area/ tried through research.

**22. b) Explain how various practices carried out in the field help to control crop diseases. (8 marks)**

- Crop rotation- helps to break life cycles of disease causing organisms

- Rogueing- to prevent further spread of the disease.

- Planting disease free planting materials/ use of certified seeds- prevents introduction of pathogens in the field.

- Close season- helps to break the life cycle of pathogens.

- Timely/early planting- help crop to establish faster before attack

- Proper spacing- creates unfavorable micro-climate for some pathogens.

- Weed control- eliminate weeds that could be alternate hosts for particular pathogens.

- Use of resistant varieties- ensure crop is not attacked by the pathogen.

- Use of clean equipment/tools- reduces contamination with disease causing organisms hence prevent spreading of the disease from one plant to the other.

- Quarantine-prevent introduction of pathogens into the farms

- Heat treatment- kills the pathogens.

- Pruning- creates unfavorable microclimate for some pathogens/minimizes prevent spread of diseases.

- Destroy crop residue- kills the pathogen.

- Control the vectors — helps to slop spread of pathogens.

- Proper plant nutrition — helps plants resist disease attack/ control deficiency diseases.

• Use of appropriate chemicals e.g. fungicides- to kill pathogens

**22.c) Transplanting of seedlings. (7 marks)**

- Water nursery thoroughly before transplanting

- Dig the planting holes at appropriate depth

- Select healthy seedlings

- Lift the seedlings carefully with as much soil as possible to avoid root damage/ use a garden trowel

- Transport seedling careful/v to the end field using appropriate means

- Transplant on a cloudy day or late in the afternoon

- Place insecticide in the hole to control soil borne pests

- Place the seedling in the planting holes at the same depth they were in the nursery bed

- Fill the holes with soil and firm around the seedlings

- Apply mulch or erect a shade

- Water the seedling thoroughly

**23). a) Study the following information which was extracted from Mr. Rono’s farm record on 31st December 2021 and answer the question below.**

|  |  |
| --- | --- |
| Item  | kshs |
| Debts receivable  | 18,000 |
| Loans payable | 300,000 |
| Cows | 250,000 |
| Chicken  | 80,000 |
| Goats  | 30,000 |
| Debts payable to cooperative | 20,000 |
| Buildings and structures  | 600,000 |
| Wages payable to workers  | 19,000 |
| Cattle feed in store | 10,000 |
| Animal drugs in store | 4,000 |
| Breakages to repair | 30,000 |
| Cash at hand | 20,000 |
| Cash in bank | 30,000 |
| Farm equipment  | 12,000 |

Prepare a balance sheet for Rono’s farm using the information above. (10mks)

|  |
| --- |
| **Mr.Rono’s farm balance sheet as at 31st December 2021** |
| **ASSETS** | **LIABILITIES** |
|  | Kshs. | Cts |  |  |  |
| **Fixed Assets** |  |  | **Long term liabilities**  |
| Building and structures | 60,000 | 00 | Loan payable to bank  | 300,000 |  |
| Cows  | 250,000 | 00 |  |  |  |
| Chicken  | 80,000 | 00 |  |  |  |
| Goats  | 30,000 | 00 |  |  |  |
| Farm equipment | 12,000 | 00 |  |  |  |
| Sub total  | 972,000 | 00 |  |  |  |
| **Current assets**  |  |  | **Current liabilities**  |
| Cattle feeds in store | 10,000 | 00 |  |  |  |
| Animal drugs in store | 4,000 | 00 | Wages to workers  | 19,000 |  |
| Debts receivable | 18,000 | 00 | Breakages and repair | 30,000 |  |
| Cash at hand  | 20,000 | 00 |  |  |  |
| Cash at bank | 30,000 | 00 |  |  |  |
| Sub total **Total Assets**  | 82,000**1,054,000** | 00 | Sub total **Total liabilities**  | 69,000**369,000** |  |
|  |  |  | Net worth/ owner’s equity/ net capital/ balance | 685,000 |  |
| TOTAL | **1,054,000** | 00 | TOTAL | **1,054,000** | 00 |

**23. b) Describe the properties of nitrogenous fertilizers. (5 marks)**

- Highly soluble in soil water therefore should be applied in an already established crop.

- Have short residual effect, thus should be applied frequently.

- They have a scorching effect burning effect therefore should not come into contact with the plants.

- The fertilizers are hygroscopic/abs orb moisture from atmosphere therefore it should be stored in dry conditions

- The fertilizers are corrosive therefore they should not be handled with bare hands/stored in easily corroded containers

- Are easily leached therefore they should be applied to a vigorously growing crop/already established crop

- The fertilizers are Volatile therefore they should be applied on moist soils.

The fertilizers are Volatile therefore they should be applied on moist soils.

**23. c) Describe five problems farmers face in marketing of water melon. (5marks)**

- Perishability of produce-farmers incur losses of produce due to extra costs for transportation/ storing

- Bulkiness-hence occupy large space or require expensive or heavy transport.

- Transportation- due to poor infrastructure in various farming communities and lack of vehicles, transportation is a big problem.

- Seasonality of produce create storage problems, especially during peak seasons/under or over supply leading to fluctuation of prices.

- Storage is difficult- because of bulkiness/perishability of the produce, large space and special storage facilities are required, which is very costly

- Changes in market demand- there is time lag between decision to produce and actual availability of the product. This makes it difficult for a farmer to respond immediately to market demand.

- Change in supply- caused by under or overproduction/ competition from cheap imports causing price fluctuation.

- Lack of perfect market Information of market situation-many farmers are ignorant about the prevailing prices of their produce in other parts of the country making selling difficul

**24. a) i) Ecological requirements**

Altitude – 900 – 2700m above sea level

Temperature – cool conditions

Rainfall – 750-2000m per annum, well distributed throughout the growing period

Soils- Deep, fertile, well drained soils. (Any 2 x 1= 2mks)

**ii) Field management practices**

- Control weeds by hand; care should be taken not to break the leaves

- Top dressing when cabbages are 20 -25cm in height using one table spoonful of S.A/CAN

- Control pests such as Aphids, cutworms, cabbage saw fly by spraying appropriate pesticide

- Control diseases such as damping off, black rot and downy mildew by use of appropriate fungicide, crop rotation.

- Gapping by replacing the dead/ dry seedlings

- Irrigation to ensure proper growth. (3 x 1= 3mks)

**b) Advantages of using seeds as planting materials**

- Seeds are easy to treat against soil borne pests and diseases.

- Seeds are less bulky hence storage is easy

- Easy to handle during planting making operation faster

- When planting seeds, it is easy to use machines like seeds planters and drillers

- Easy to mechanize fertilizers and manures

- Pesticide to apply manures and fertilizers together with seeds during planting

- It is possible to develop new crop varieties due to cross pollination (1 x 5= 5mks)

**24. c) Filtration at water intake**

Water is passed through a series of sieves with different meshes to trap large particles

- Softening of water

Soda ash/ sodium bicarbonate is added to soften water

- Coagulation and sedimentation

Alum/ Aluminum sulphate is added to coagulate solid particles

Water stays here for 36 hours to kill bilharzia worms

Aeration of water is done by perforations on top of the tank.

- Filtration II

Water is passed through different layer sizes of gravel and sand on top to remove solid particles left behind.

- Chlorination

Small quantities of chlorine is added to kill microorganisms in water

( stage 1 mark, use 1 mark; 2 x 5 = 10mks)