KANDARA SUB- COUNTY FORM 3 JOINT EVALUATION

AGRICULTURE
Paper 1
Oct/Nov. 2015
MARKING SCHEME

SECTION A : (30 Marks)

1. Branches of horticulture

i) Olericulture
ii) Pomoculture
iii) Floriculture
iv) Viticulture
3 x ½ = 1½mks

2. Ways of harvesting water on the farm

i) Roof catchment / roof
ii) Rock catchment / rock
iii) Weir / dam
iv) Retention ditches / level terraces
v) Microcatchment
vi) Water pans / ponds
4 x ½ = 2mks

3. Farm records kept by a maize farmer

i) Maize production records
ii) Labour records
iii) Field operations records
iv) Inventory records
v) Marketing records
4 x ½ = 2mks

4. Three types of individual land tenure system

i) Individual owner operator
ii) Landlordism and tenancy
iii) Concession or company
3 x ½ = 1½mks

5. Farming practices that help to achieve minimum tillage

i) Mulching
ii) Cover cropping
iii) Slashing are uprooting of weeds
iv) Use of herbicides to control weeds
v) Restricting cultivation around the base of crop
4 x ½ = 2mks

6. Benefits of humus to crops

i) Enriches the soil with nutrients
ii) Increases water holding capacity of soil
iii) Provides a good habitat for useful soil organisms
iv) Improve soil aeration
v) Helps to modify or regulate the soil temperature to suitable level for crop growth
vi) Helps to buffer the soil pH
vii) Improves cation exchange capacity of the soil, enabling the cations such as calcium, potassium and magnesium to be retained for crop use
4 x ½ = 2mks

7. a) Ways of utilizing napier grass

i) Cutting and drying as hay
ii) Conserving as silage
iii) Conserving as standing forage
3 x ½ = 1½mks

b) Roles of additives in silage making

i) To increase palatability
ii) To increase nutrient value of silage
iii) To boost carbohydrates content of silage
iv) Restrict growth of undesirable micro-organisms
2 x ½ = 1mk

8. Common sorghum diseases

i) Leaf blight
ii) Anthrancnose
2 x ½ = 1mk

9. Agricultural activities that increase light intensity in crops
i) Thinning
ii) Pruning
iii) Staking
iv) Propping
v) Wider spacing
3 x ½ = 1½mks

10. Reasons for carrying out

i) Pricking out
   - to reduce competition thus ensuring that the seedlings grow healthy and strong
ii) Rogueing
   - to control pests and diseases
   2 x ½ = 1mk

11. Calculate the amount of K_2O that is contained in 400kg of NPK fertilizer 25 : 10 : 5

100kg NPK contain 5kg K_2O
∴ 400kg NPK contain
$$= \frac{5kg\ K_2O \times 400kg\ NPK}{100kg\ NPK}$$

$= 200kg\ K_2O$
2 x 1 = 2mks
(units must be shown if not 1mk)

12. Characteristics of large scale farming

i) Huge capital investment
ii) Use of skilled labour
iii) High level of management
iv) Application of new found techniques of farming
v) Involve use of large areas of land
   4 x ½ = 2mks

13. Reasons for innoculating legume seeds

i) It encourages nodulation
ii) It enhances nitrogen fixation
   2 x ½ = 1mk

14. Ways of raising soil pH to soil pH 6.5

i) Applicationo f basic fertilizer
ii) Application of lime
   3 x ½ = 1½mks

15. Factors that determine the depth of planting seeds

i) Size of the seeds
ii) Soil type
iii) Type of germination
iv) Soil moisture content
   3 x ½ = 1½mks

16. Three conditions that necessitate basin irrigation

i) Flat land
ii) Availability f a lot of water
iii) Soils with high water holding capacity
   3 x ½ = 1½mks

17. a) Aspects of light that influence crop growth

i) Light intensity
ii) Light duration
iii) Light wavelength
   3 x ½ = 1½mks

b) Propagation materials for :

i) Sisal - suckers, bulbils
ii) Pineapples - crowns, slip, sucker
iii) Irish potatoes - stem tubers
   3 x ½ = 1½mks

18. Disadvantages of tissue culture

i) It is expensive
ii) Takes time before desired results are realized
iii) High level of technical know how is needed
iv) Requires a special working environment / controlled conditions are required
   2 x ½ = 1mk

SECTION B : (20 Marks)

19. a) Identify the pest

   - Armyworm   *1 x 1 = 1mk*

b) Type of mouth parts

   - biting and chewing mouth parts
     1 x 1 = 1mk

c) Damage caused by the pest and effect on crops

   - eating of leaves, causing defoliation
   Effect - reduces surface area for photosynthesis
   2 x ½ = 1mk

d) Why infestation of the pest is epidemic
   - they move in large numbers and cause total defoliation
   1 x 1 = 1mk

20. a) Identify weeds

P- thorn apple / Datura / <u>Datura Stramonium</u>
Q - couch grass / <u>Digitaria Scalarum</u>
2 x ½ = 1mk

b) Effects of weed P to livestock

- it is poisonous   *1 x 1 = 1mk*

c) Reasons why it is difficult to control weed Q

- because it has underground roots which when cut develop through rhizomes
1 x 1 = 1mk

21. a) Name parts

B_1 - root stock
B_2 - scion
2 x 1 = 2mks

b) Methods of propagation shown by

B_3 - whip or tongue grafting
C - trench layering
2 x 1 = 2mks

c) Name one crop propagated using

B_3 - orange, lemon, avocados, mangoes
C - apple, raspberry, gooseberry

22. i) Identify the disease

Maize smut   *1 x 1= 1mk*
(reject smut alone)

ii) Other crops attacked by same disease

- wheat
- barley
- sugarcane
3 x 1 = 3mks

iii)Control measures of the condition

- crop rotation
- rogueing
- plant resistant varieties
- use certified seeds
3 x 1 = 3mks

SECTION C :(40 Marks)

23. a) Production of carrots

i) Varieties
• Fresh market varieties / any appropriate example below
   - money maker
   - hundredfold
   - bee eater
   - hot set
   - Ailsa craig
   - super marmande
   - ponderosa
   - marglobe

• Processing varieties / any appropriate example below
- primabel
- seinz
- cal J
- Kenya Beauty
- Rutgers
- 10X hybrid
- San Merzano
2 x ½ = 1mk

ii) Land preparation

i) select a field where members of solanaceae family have not been grown for the last three years to control spread of pests and disease
ii) dig deeply to control all perennial weeds
iii) remove any hard object / stones
2 x 1 = 2mks

iii)Field management practices

i)   Top dress when seedlings are 25-20cm tall with nitrogenous fertilizer
ii) Apply nitrogenous fertilizer at rate of 100kg/ ha
iii) Irrigate when dry
iv) Weed regularly / keep field weed free
v)   Thin properly
vi) Do earthing up
vii) Control pests appropriately
viii) Control diseases appropriately
8 x 1 = 8mks

b) <u>Main characteristics of nitrogenous fertilizer</u>

i) Highly soluble in soil water
ii) Easily leached
iii) Have short residual effect
iv) Have scorching or burning effect on plants
v) Are highly volatile
vi) Are hygroscopic
vii) Are highly corrosive
   4 x 1 = 4mks

c) <u>Methods used in application of inorganic fertilizers</u>

i) Broadcasting
ii) Placement method
iii) Side dressing
iv) Foliar spraying
v) Drip
   5 x 1 = 5mks

24. a) <u>Define soil erosion</u>

This is the process of removal and carrying away of top soil or detachment and transportation of soil minerals from one place to another
1 x 1 = 1mk

b) <u>Cultural soil conservation measures</u>

i) Cover crops
ii) Grass strips / filter strips
iii) Grassed waterways
iv) Contour farming
v) Strip cropping
vi) Mulching
vii) Afforestation / reafforestation / forestation
   4 x 1 = 4mks

c) <u>Describe types of water erosion</u>

i) Splash / raindrop erosion
   - as a rain drop falls down it gains kinetic energy and on hitting the soil surface, it detaches and disperses the soil particles
ii) Sheet erosion / overland flow erosion
   - this is the uniform removal of soil in thin layers caused by flowing surface run-off
iii) Rill erosion
   - this is the removal of soil by running water in small channels (rills) where there is a concentration of flowing water down the slope
iv) Gulley erosion
   - this is an advanced stage of rill erosion where large gulleys are formed by flowing water
v) Riverbank erosion
   - this is erosion caused by rushing water in streams and rivers along their banks
   4 x 2 = 8mks
   (1mk stating, 1mk describing)

d) <u>Describe process through which soil can lose fertility</u>

i) Through surface soil erosion which carriers away top fertile soil
ii) Continuous cropping where soil is not given a resting period
iii) Monoculture or monocropping whereby one type of crop is continuously grown on the same piece of land making certain nutrients deficient
iv) Salinization as a result of continued use of the same type of fertilizer which makes the soil pH unsuitable for certain types of crops
v) Change of soil pH because different crops require different pH levels
vi) Leaching whereby soluble nutrients are washed downwards beyond the root zone during water infiltration
vii) Burning of vegetation during land clearing which destroys organic matter and kills useful soil organisms
viii) Hard pans which hinder water infiltration and root penetration
ix) Excess presence of weeds which compete with crops for available nutrients, light and space
x) Soil capping which prevents water infiltration causing surface run off
   7 x 1 = 7mks

25. a) <u>Explain factors that influence a well designed crop rotational program</u>

i) Crop roof depth - deep rooted crops should be alternated with shallow rooted crops
ii) Crop nutrient requirements - heavy or gross feeders should come first in a newly opened land which is relatively fertile
iii) Weed control - alternate crops which are easy to weed with those not easy to weed
iv) Pests and disease control - crops from the same family should not follow each other as

they are attacked by the same pests and diseases

v) Soil fertility - alternate legumes with non-legumes to improve soil fertility

vi) Soil structure include fallow or grass leys in the rotation to improve soil structure
6 x 1 = 6mks
(emphasy on explanation)

b) Reasons why timely ploughing is important

i) Allows adequate time for organic matter to decompose

ii) Allows adequate time for weeds to be dehydrated

iii) Allow the soil clods to weather before subsequent operations

iv) Allows for early planting so that crops establish early before the weeds grow

v) Allows for soil borne pathogens and pests to starve and die

vi) Minimises labour competition

vii) Allows water penetration into the soil

viii) Allows soil aeration

ix) Facilitates timely subsequent operations
4 x 1 = 4mks

c) Describe harvesting of coffee

i) Pick red ripe berries / cherries

ii) Spread the berries on sisal mats and sort them out into grades 1, 2 and 3

iii) Deliver grades 1 and 2 to the factory for pulping on the same day

iv) Dry grade 3

v) Deliver grade 3 to the factory at the end of harvesting season

vi) Picking interval of 7 to 14 days
(order not important)
5 x 1 = 5mks

d) Reasons for land consolidation

i) Proper supervision

ii) Saves time and travel costs between plots

iii) Easy to offer extension services on the actual and on spot inspection of land

iv) Encourages sound farm planning and adoption of crop rotation programmes

v) Encourages soil conservation and land improvement

vi) Encourages mechanization due to enlarged land holdings

vii) Encourage construction of permanent structure / undertake long term projects

viii) Enhance weed, pest and disease control
5 x 1 = 5mks