KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

NAIROBI SCHOOL

AGRICULTURE

PAPER 1

MARKING SCHEME

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NAIROBI SCHOOL KCSE TRIAL AND PRACTICE EXAM 2016

AGRICULTURE

PAPER 1 /443/1

MARKING SCHEME

SECTION A: (30 Marks)

1. a) Ways by which agriculture contribute to National development.
   - Provision of raw materials to industries.
   - Source of capital for further expansion.
   - Provision of market for industrial goods.
   - Provision of employment directly or indirectly.
   - Earns the county foreign exchange.
   - Provision of taxes to the government to finance national development programmes. e.g schools, roads, water etc.

   b) Effects of high level education and Technology on agricultural production.
   - Provide skill require in carrying out production practices.
   - Provide knowledge required improper methods of production.
   - Leads to positive change in carrying out production practices.
   - Leads to positive change in attitude involving practices and consumer preference. (2 x ½ = 1mk)

2. Two insect pests attacking sorghum in the field.
   - Sorghum
   - Stem borer (2 x ½ = 1 mk

3. Two conditions when opportunity cost is zero
   - No alternative enterprises
   - Where production are free.
   - When the good is abundant. (2 x ½ mk)

4. Four conditions limiting shifting cultivation
   - High population density
   - Individualized owing of land.
   - Time wastage in shifting and building structures
   - Lack of incentive to conserve soil. (4 x ½ = 2mks)

5. a) Three reasons for practicing grafting in citrus.
   - Plants with desirable root characteristics but with undesirable fruits can be used to produce desirable fruits can be used to produce desirable produces e.g lemon orange graft.

   (4 x ½ = 2mks)
   - Facilitate changing the top of the tree from being undesirable to desirable.
   - Makes it possible to grow more than one type of fruit on the same plant.
   - Repair of damaged trees.
   - Shorten maturity age.
   - Less thorny. (3 x ½ = 1 ½ mks)

   b) Method of breaking seed dormancy in:
   a) Calliandra - Heat treatment / Light burning
   b) Rice - Soaking in cold water. 2 x ½ = 1mk)

6. Two ways by which PH of a soil is raised.
   - Liming / Application of lime.

- Application of a basic/ alkaline fertilizer e.g Basic slag.
- Add manure (2 x ½ = 1mk)

7. Reasons why organic matter is necessary in the soil.
Heat this raising the soil temperature.
- Improves soil structure/ increase water holding capacity.
- Provides food nutrients to soil micro - organisms.
- Increase cation exchange capacity.
- Reduces the toxity in the plant.
- Buffers soil PH.
- Improves soil fertility by releasing nutrients in the soil. (4 x ½ mks)

8. Two disadvantages of surface / irrigation.
- Causes salinisation of the soil.
- Causes soil erosion
- Wastes a lot of water
- Require leveling of land.
- Leads to uneven distribution of water. (2 x ½ = 1 mk

9. Two disadvantages of mixed pasture.
- Higher yields of storage per unit area.
- High Nutritive value.
- Improve soil / fertility due to nitrogen fixation.
- Economy in use of nitrogen fertilizer.
- There's security against total pasture loss/ failure. (2 x ½ = 1mk)

10. Four types of soil erosion by water.
- Splash/ Raindrop erosion.
- Sheet erosion
- Rill erosion.
- Gully erosion.

11. Two conditions for maximum efficiency of herbicides
- Stage of growth of the plant
- Plant morphology & anatomy.
- Mode of action.
- Environmental factors.
- Leaf angle or leaf surface area.
- Concentration.
- Time of application. (2 x ½ = 1mk)

12. Two functions of polythene sheet when used as mulch material.
- Conserve moisture
- Smoother weeds
- Regulates soil temperature
- Reduce soil erosion.

13. Four principals of co – operative societies in Kenya.
- Open membership
- Equal rights
- Interest on shares
- Withdrawal from membership.

- Loyalty and faithful.
- Education
- Co – operative principal
- Non- profit motive. (4 x ½ = 2mks)

14. Differentiate between coppicing and pinching out. Coppicing is a method of harvesting trees by cutting the stem to leave about 15cm above the ground. While pinching out is a method of pruning where the terminal bud is removed to encourage internal growth. (Mark as a whole 2mks)

15. Two sources of nitrogen in the soil plants.
- Microbial / activities (Fixation by micro – organizing)
- Fixation by lighting.
- Organic manure.
- Application nitrogenous fertilizer. (2 x ½ = 1mk)

16. Two benefits of possessing certificate of land ownership.
- Can be used to secure credit facilities loan.
- Confer security of tenure.
- Encourages the farmers to invest on long term.
- Enable the land owner to lease part or whole.

17. Four ways of improving labour effiency in the farm.
- Training
- Farm mechanization
- Giving incentives/ improving terms and conditions of services labour supervision.
- Division of labour
- labour supervision
- Use of efficient tools / equipment.
- Assigning specific tasks to workers.
- Proper remuneration of workers.
- Provision of transport within the farm.
- Provision of guidance & counseling to workers (4 x ½ = 2mks)

18. Two benefits of minimum tillage.
- Reduces, cost of cultivation tillage.
- Maintains the soil structure.
- Conserve soil moisture.
- Control soil erosion.
- Prevents disturbance of routs and underground structure.
- Prevents exposure of humus to adverse conditions. (2 x ½= 1mk)

19. Reasons for carrying out the following practice.
i) Hardening OH
It prepares the seedlings to adapt to the ecological conditions by involving gradual reduction of shade and watering 1-2 weeks before transplanting.
ii) Watering before transplanting seedlings.
Iii) Hardening in onions- breaking of the top chaum two weeks before harvesting to harden the skin to avoid bruising during harvesting and transportation. (3 x 1 = 3mks)

20. i) Capillarity in the three different soils. (½ mk)
ii) A - Sandy soil

B - Loan soil

C - Clay soil. (3 x ½ mks)

iii) A - Rough / Course textured (½ mk)
C - Fine textured

iv) Use of organic manure. (½ mk)

21. i) Use of Organic manure (½ mk)

ii) By eating the grain the grains.
- Opening the cob to water that leads to rotting of the grains.
- Destroys crop leaves reducing photosynthetic area. (1/ ½ mks)

iii) Use of scare- crows
- use of explosives
- Trapping
- Use of resistant varieties. (2 x ½ = 1mk)

22. i) Staking (½ mk)

ii) Procedure for spraying
- Read the label/ manufacture's
- Measures the required amount of fungicide.
- Place in a container and mix chorography until the power has formed a sherry.
- Pour the mixture into the knapsack spayer through the sieve.
- Spray the mixture onto the crop. (3 x ½ = 1 ½ mks)

iii) - Fungal disease (1 x ½ = ½ mk)
- early blight
- late blight

iv) - Safety measures
- Spray following the direction of the wind.
- Wear protective clothing
- Avoid eating or smoking while handling fungicides.
- Avoid spillage of the fungicide/ contamination of the environment.
- Do not suck / blow a blocked nozzle. (2 x ½ = 1mk)

23. i) Marginal rate of substitution

V = $\frac{48-39}{2-1}=9$

W = $\frac{32-27}{4-3}=5$

X = $\frac{23-21}{6-5}=2$

Y = $\frac{20-19}{-1}=1$ (4 x ½ mk = 2mks)

ii) Least cost combination (LCC)

LCC = $\frac{px^1}{px_2}$

Where P = Price
X1 = Dairy Meal
X2 = Home made Feed

= $\frac{8}{2}=4$ (Formula 1mk Answer ½ mk = ! ½ mks)

24. Elasticity of Demand (Ed)

Ed = $\frac{\Delta Q}{\Delta P} x \frac{p\ (Original \text{Price})}{Q(Origianl Quality)}$

= $\frac{20-22\ x}{2000-1800} x \frac{2000}{20}$

= $\frac{2}{200} x100 = 1\ (Formula 1\ Answer^{1}/_{2}$ = 1 ½ mks)

ii) Type of elasticy of demand is unitary elastic demands. (½ mk)

25. Compost heap

i) F - Top Soil
G - Ash
H - Olk Manure
J - Top Soil

ii) Importance.
J - Provides micro – organisms
- Covers the compost to prevent escape of gases.
H - Adds micro – organism to the compost.
G. Provides potassium
- Neutralizes the acidic effect produced by organic acids during fermentation/ speeds up the fermentation process
(3 x ½ = 1 ½ mks)

26. Weed

i) Oxalis/ Oxalis latiflia/ Oxalis Spp. (½ mk)

SECTION C 40 mks)

27. a) Five factors that influence soil productivity.
- Good supply of crop nutrients.
- Well aerated
- Good drainage
- Abundance of useful soil micro- organisms.
- Adequate water retention.
- Freedom from plant pests and diseases causing organism.
- Free from obnoxious weeds eg witch weeds. Starting 1mk (10 x 2 = 10 mks)

b) Five factors to consider in choosing a method of irrigation.
- Type of soil
- Type of crop to be grown.
- Source of water / Quality of water.
- Size of land to be irrigated.
- Capital available/ topography of land.
- Profitability / viability of enterprise

c) Qualities of mother plant
- High yielding
- Resistant to pests / diseases
- High quality produce.
- High rooting ability.
- Early maturing (5 x 1 – 5mks)

28. a) Benefits of using organic matter for mulching.
- Improves soil aeration upon decomposition.
- Reduced toxicity of plant poisons upon decomposition.
- Reduces soil erosion.
- Improves soil structure on decomposition.

- Modifies the soil temperature .
- Add nutrients on decomposition.
- Improves water infiltration.
- Increases microbial activity .
- Controls weeds.
- Reduces evaporation of water.
- Buffers soil PH upon decomposition. (7 x1= 7= 7 mks)

b) Production of napier grass.

i) Plant at the onset of the rains/ early planting.

- select desirable napier grass variety for the ecological area.
- Use healthy planting materials.
- Use cuttings/ canes of splits for planting.
- Cutings / canes should have 3 – 5 nodes.
- Select cutting from mature canes/ stems
- Place planting materials in the furrows / holes.
- Cover the materials with soil to appropriate depth. (Any 3 x 1 = 3mks)

ii) Fertilizer application.

- Apply phosphate fertilizer at planting time.
- Apply farm yard. Manure/ Compost manure before planting.
- Rate of organic manure should be 7 – 10 tons / ha.
- Apply organic manure after harvest and dig it into the soil every years.
- top dress with nitrogen and potassium 6-8 weeks after planting.

(any 3 x 1 = 3mks= 3mks)

iii) Utilization

- Cut and feed to ruminated.
- Defoliate/ cut at the right stage of growth 3 – 5 months old when stems are 1 – 1.5m high.
- Cut the stems at 2.5 – 5 cm above the ground surface.
- Use a sharp panga for cutting .
- Conserve excess as silage.
- Chop Napier grass into small pieces
- It can be dried and used as mulch. (any 3 x 1 = 3mks)

c) Procedure for transplanting seedling from a bare roof nursery bed.

- Prepare planting holes prior to transplanting.
- Separate top soil from sub – soil as you dig the hole.
- Mix the top soil with manure and refill the hole half- way.
- Water the seedlings properly a day before transplanting.
- Carefully lift the seedling using a garden trowel and place it at the centre of the planting hole.
- Re – fill the hole with the soil.
- Firm gently around the seedling until the hole is completely filed.
- Water the seedling.
- Provide a shade. (4 x 1 = 4mks)

29. a) For agricultural practices which pollute water.

- Use agro – chemicals in the farm hands.
- Cultivating along river banks encouraging soil erosion, flooding and siltation of streams, rivers etc.
- Agro – processing factories which drain effluents directly into rivers, streams and lakes.
- Over – grazing leading to soil erosion and siltation of water sources.

(stating 1mk Explanation 1mk) (4 x 2 = 8mks)

b) Spacing
- Soil moisture content
- Seed size
- Soil type
- Type of germination
- Soil moisture content.
- Soil fertility.
- Machinery to be used.
- Intended use of the crop.
- Growth habit
- Prevalance of pests/ diseases.
- Cropping systems. (Stating ½ mk Explaining) 8 x1= 8 mks)

c) Precaution when harvesting coffee.
- Over – ripe dark coloured cherries should not be picked.
- Under – ripe / green coloured cherries should not be picked.
- Sort out diseased berries before delivering to the factory to avoid pulping problems.
- Deliver cherries to the processing factory on the day of harvesting.(4 x 1 = 4mks)