THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

034/1 **AGRICULTURE SCIENCE 1**

(For Both School and Private Candidates)

Time: 3 Hours **ANSWERS** **Year: 1994**

Instructions

1. This paper consists of sections A, B and C with a total of **thirteen (13)** questions.

2. Answer **all** questions in sections A and B and **one (1)** question from section C.

3. Sections A and C carry **fifteen (15)** marks each and section B carries **seventy (70)** marks.

4. Cellular phones and any unauthorised materials are **not** allowed in the examination room.

5. Write your **Examination Number** on every page of your answer booklet(s).

1. the following are among the major preharvest principles of crop production except
a seed selection
b spacing and thinning
c winnowing
d field pests control

winnowing is a postharvest activity used to separate chaff from grain. all other options are preharvest practices.
c winnowing

2. a free market in agricultural production may arise as a result of
a monopoly
b pure competition
c monopsory
d oligopoly

a free market is characterized by many buyers and sellers, which aligns with pure competition.
b pure competition

3. a good example of a compound fertilizer is one of the following
a a.s.n.
b c.a.n.
c n.p.k.
d t.s.p.

compound fertilizers contain two or more nutrients. n.p.k. contains nitrogen, phosphorus, and potassium.
c n.p.k.

4. all of the following are varieties of oranges except
a emperor
b washington navel
c valencia
d hamlin

emperor is a variety of mandarin, not an orange.
a emperor

5. the following groups of farm animals are ruminants except
a donkey, duck, rabbit
b cattle, pig, turkey
c sheep, goat, water buffalo
d rabbit, pig, duck

ruminants have a four-chambered stomach for digesting fibrous plant material. only option c consists of true ruminants.

c sheep, goat, water buffalo

6. when oxen are used to pull a plough or a cart, a harness has to be fixed on them. such a harness is called

a skey
b yoke
c tool bar
d drawbar

a yoke is a wooden crosspiece placed on oxen to enable them to pull loads.

b yoke

7. which method would you use to control blossom end rot on tomatoes in the school garden?

a planting resistant varieties
b fumigating the soil
c regular watering
d applying copper fungicides

blossom end rot is caused by calcium deficiency due to irregular watering. maintaining consistent moisture prevents it.

c regular watering

8. all of the following are heavy breeds of poultry except

a white leghorn
b light sussex
c new hampshire
d rhode island red

white leghorn is a light breed, while the others are heavy breeds.

a white leghorn

9. if the annual depreciation of a nine-year-old agricultural tool is shs.50/= while its salvage value is shs.50/=, what was the original cost of the tool?

a 100
b 450
c 500
d 550

original cost = (annual depreciation × years) + salvage value
= (50 × 9) + 50
= 450 + 50
= 500

c 500

10. the major portion of the soil by volume is occupied by
a water
b air
c organic matter
d mineral matter

soil consists mostly of mineral particles, which form its solid phase.
d mineral matter

11. all of the following are varieties of tomatoes except
a money maker
b early long purple
c early beauty
d marglobe

early long purple is an eggplant variety, not a tomato.
b early long purple

12. an effective vaccination programme is suitable for controlling the following livestock diseases
a foot and mouth disease and rinderpest
b trypanosomiasis and red water
c rinderpest and east coast fever
d foot and mouth disease and mastitis

vaccination is effective against viral diseases such as foot and mouth disease and rinderpest.
a foot and mouth disease and rinderpest

13. when drenching a cow, which of the following farm structures is most suitable for restricting the movement of the cow in every direction?
a prenching crate
b prenching race
c crush
d service crate

a crush is a restraining structure used to control livestock during treatment.
c crush

14. the practice of continuously growing one annual crop after the same type of crop has been harvested is called:
a continuous cropping
b monoculture

c relay cropping
d monocropping

monoculture is the repeated cultivation of the same crop on the same land.
b monoculture

15. which of the following terms describes the practice of feeding ewes on better pasture or forage for 2 to 3 weeks before mating?
a docking
b flushing
c steaming up
d raddling

flushing improves body condition, increasing ovulation rates in ewes.
b flushing

16. which one of the following groups of drugs is most suitable for eradicating parasitic, bacterial, and fungal diseases in a fish pond?
a amprol, zioline, sulphonamide
b bromex, zioline, gamma bhc
c malachite-green, copper sulphate solution, diptrex
d copper sulphate solution, bromex, gamatox

malachite-green and copper sulphate control fungal and bacterial infections in fish ponds.
c malachite-green, copper sulphate solution, diptrex

17. which of the following pesticides is most suitable for controlling the larger grain borer in a grain store?
a permethrin
b kynakil
c phostoxin
d warfarin

phostoxin (aluminium phosphide) is commonly used to fumigate grain stores against storage pests like the larger grain borer.
c phostoxin

18. in order to promote growth and reproduction of freshwater fish in a pond, it is advisable to do all of the following except
a apply lime in the pond
b apply compost in the pond
c apply local beer wastes in the pond
d apply sulphate of ammonia in the pond frequently

sulphate of ammonia can cause excessive algal growth, leading to oxygen depletion.
d apply sulphate of ammonia in the pond frequently

19. which of the following is least influenced by forests?
a erosion
b leeward rains
c drainage
d catchment areas

leeward rains are mainly determined by wind patterns and mountain ranges rather than forests.
b leeward rains

20. which of the following is a non-pressure method of applying preservatives on wood?
a lowny process
b reeping process
c diffusion process
d bettle process

the diffusion process involves soaking wood in preservatives without applying pressure.
c diffusion process

21. a) briefly describe what you understand by the term mulching.

mulching is the practice of covering the soil surface with organic or inorganic materials to conserve moisture, regulate temperature, and suppress weeds.

b) state any four advantages of applying mulch in the field after you have transplanted tea or coffee seedlings.

i) reduces evaporation – helps retain soil moisture, especially during dry seasons
ii) prevents soil erosion – reduces the impact of raindrops and wind on the soil
iii) suppresses weed growth – blocks sunlight, limiting weed germination
iv) improves soil fertility – organic mulch decomposes, adding nutrients to the soil

c) state any four problems which can be expected to occur in a tea/coffee field which is mulched.

i) pest infestation – mulch can provide a hiding place for pests such as rodents and insects
ii) excess moisture retention – can create a humid environment favorable for fungal diseases
iii) nutrient competition – thick layers of fresh mulch may temporarily tie up nitrogen as they decompose
iv) labor-intensive – applying and maintaining mulch requires additional effort and resources

22. imagine that your school projects committee decides that onions, among other vegetable crops, be raised in the school garden for generating income. using the headings given below, describe the activities to be undertaken in raising the onion crop.

a) land preparation – plough and harrow the land to obtain a fine seedbed, ensuring proper drainage and aeration
b) weeding – remove weeds regularly to prevent competition for nutrients and water
c) fertilizer application – apply phosphorus-rich fertilizer at planting and nitrogenous fertilizer during vegetative growth
d) pest control – use insecticides to manage thrips and fungal sprays to prevent downy mildew

23. what are the uses of each of the following survey instruments?

a) tripod level – used to support levelling instruments for land survey
b) levelling staff – measures differences in elevation on land surfaces
c) odometer – measures distances by recording wheel rotations
d) ranging pole – marks positions and aligns survey points
e) compass – determines direction and bearings during land surveys

24. indicated in the first column of the table shown below are five breeding stages in pig production. complete the table by:

breeding stage	time duration	stage from which it begins
mating	1-2 days	after heat detection
gestation period	114 days (3.8 months)	after successful mating
farrowing	1 day	after gestation ends
weaning	6-8 weeks	after farrowing
culling and selection	ongoing process	after weaning or later in life

25. a) list any six differences between the use of animal power (oxen) and tractor power on the farm.

i) oxen require food and rest, while tractors rely on fuel and can work continuously
ii) oxen are cheaper to acquire but have lower efficiency compared to tractors
iii) tractors require more maintenance, whereas oxen only need basic care and feeding
iv) tractors work faster and cover more land than oxen
v) oxen are environmentally friendly, while tractors emit pollutants
vi) tractors can perform a variety of tasks with different implements, whereas oxen have limited functionality

b) a team of two oxen costs a farmer shs. 10,000/= and he expects to use oxen for seven years. at the end of eight years he will sell the oxen for a total of shs. 6,000/=. how much will it cost him to replace the oxen? show clearly how you get your answer.

cost of oxen = 10,000/=
expected resale value = 6,000/=
replacement cost = initial cost - resale value
= 10,000 - 6,000
= 4,000/=

26. assume that you are going to do a soil survey on your farm. list any ten apparatus/tools that you will need in order to carry out the soil survey work thoroughly.

i) auger – used for collecting soil samples
ii) spade – digs up soil samples
iii) pH meter – measures soil acidity or alkalinity
iv) moisture meter – determines soil moisture content
v) measuring tape – measures distances in the field
vi) marker flags – marks sample locations
vii) sample bags – stores soil samples for laboratory analysis
viii) soil thermometer – checks soil temperature
ix) sieve – separates soil particles by size
x) field notebook – records observations

27. a) define the term crop pest.

a crop pest is any organism that damages or reduces the yield of cultivated plants.

b) mention any four broad categories of crop pests.

i) insects (e.g., locusts)
ii) rodents (e.g., rats)
iii) nematodes (e.g., root-knot nematodes)
iv) birds (e.g., quelea birds)

c) describe any four methods of controlling crop pests in the field.

i) cultural control – crop rotation and intercropping reduce pest infestations
ii) biological control – introducing natural enemies like ladybugs to control aphids
iii) chemical control – applying insecticides and fungicides
iv) physical control – using traps, handpicking, and barriers like nets

28. assume that you are about to establish a vegetable garden in a rural area. list any ten tools which you will need to buy in order to facilitate good crop husbandry in your garden.

i) hoe – for land preparation and weeding

ii) rake – for leveling the soil
iii) watering can – for irrigation
iv) panga – for clearing weeds and shrubs
v) spade – for digging and soil mixing
vi) trowel – for transplanting seedlings
vii) wheelbarrow – for transporting soil and compost
viii) pruning shears – for trimming plants
ix) hand fork – for breaking compacted soil
x) sprayer – for applying pesticides and fertilizers

29. a) list any four breeds of dairy cattle.

i) friesian
ii) jersey
iii) guernsey
iv) ayrshire

b) briefly explain how any three named factors affect dairy production in tanzania.

i) climate – high temperatures reduce milk yield and cause heat stress
ii) feed availability – poor nutrition lowers milk production
iii) disease prevalence – tick-borne diseases like east coast fever reduce productivity

30. a) what do you understand by the term weed as it is used in crop production?

a weed is any unwanted plant that grows where it is not intentionally cultivated, competing with crops for nutrients, space, and light.

b) briefly describe any four mechanical methods of weed control.

i) hand pulling – removing weeds manually
ii) hoeing – cutting weeds with a hoe before they flower
iii) mulching – smothering weeds with organic materials
iv) slashing – cutting weeds close to the ground to prevent seed formation

31. trypanosomiasis, foot and mouth disease, rinderpest, east coast fever, and newcastle disease are important diseases of livestock in tanzania.

a) state the causative agent of each of the five diseases.

i) trypanosomiasis – trypanosoma protozoa
ii) foot and mouth disease – foot and mouth disease virus (fmdv)

iii) rinderpest – rinderpest virus (morbillivirus)
iv) east coast fever – theileria parva (protozoa)
v) newcastle disease – newcastle disease virus (ndv)

b) state one method of controlling each of the five diseases.

i) trypanosomiasis – use of trypanocidal drugs and tsetse fly control
ii) foot and mouth disease – vaccination and quarantine of infected animals
iii) rinderpest – vaccination and movement control
iv) east coast fever – dipping livestock in acaricides to control ticks
v) newcastle disease – vaccination and proper biosecurity measures

32. briefly explain what you understand by each of the following terms.

a) demand schedule – a table showing the quantity of a good demanded at different price levels
b) fixed costs – production costs that remain constant regardless of the level of output (e.g., rent)
c) law of comparative advantage – the principle that a country should specialize in producing goods for which it has the lowest opportunity cost
d) partial budget – an economic tool used to assess the financial impact of small changes in a farm operation
e) wholesale price – the price at which goods are sold in large quantities before reaching the final consumer

33. a) define a plant disease.

a plant disease is a physiological disturbance in plants caused by pathogenic organisms or environmental factors, leading to abnormal growth or reduced yield.

b) state any four causative agents of plant diseases.

i) fungi (e.g., rusts and smuts)
ii) bacteria (e.g., bacterial wilt)
iii) viruses (e.g., mosaic viruses)
iv) nematodes (e.g., root-knot nematodes)

c) describe the visible signs (symptoms) of each of the following plant diseases.

i) rusts – orange or brown powdery spots on leaves and stems
ii) smuts – black, sooty masses of fungal spores on grains and leaves

34. a) list any two breeds of each of the following types of goats.

i) dairy goats – saanen, toggenburg

ii) meat goats – boer, kiko
iii) hair goats – angora, cashmere

b) explain what is meant by each of the following terms as they are used in goat husbandry.

i) tupping – the mating process in sheep and goats
ii) raddling – marking ewes with a colored substance during mating to track serviced females

35. the curves below show hypothetical production functions of an agricultural product. study the curves and answer the following questions.

a) state the names of the curves labeled oa, ob, and oc.

i) oa – total product curve
ii) ob – average product curve
iii) oc – marginal product curve

b) explain the relationship between one curve and another.

i) the total product curve (oa) represents total output at different input levels
ii) the average product curve (ob) shows output per unit of input, derived from the total product
iii) the marginal product curve (oc) indicates the additional output from an extra unit of input

c) in which region is production of the agricultural product the most profitable?

production is most profitable in the stage where marginal product is positive but decreasing. this corresponds to the point before diminishing returns set in, typically at the peak of the marginal product curve.