

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION
NOVEMBER 1996

034

AGRICULTURAL SCIENCE

TIME: 2½ Hours.

INSTRUCTIONS

1. This paper consists of 35 questions in sections A and B.
2. Answer ALL questions.
3. Read the instructions given under each section carefully.
4. You are advised to spend 30 minutes on Section A and 120 minutes on Section B.
5. All answers must be written in the answer book provided.
6. Write your Centre and Index Number on the right hand corner of every page of your answer book.

This paper consists of 8 printed pages.

SECTION A

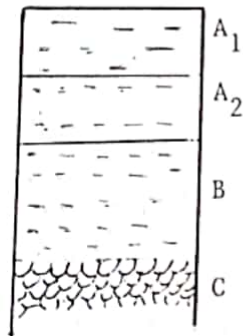
Nature of questions: multiple choice

Marks allocated: 10 marks (10%)

Time allocated: 30 minutes.

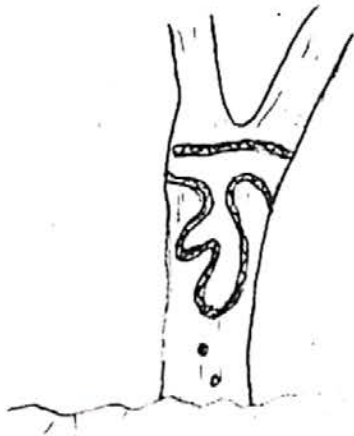
Answer all questions in this section. Under each of the questions below, only one of the four answers provided is the most correct. Write down the letter bearing the most correct answer in the answer book provided.

1. Which type of soil structure can be mostly found in the top soil of wet grasslands of the Tropics?
A. Granular/crumb
B. Prismatic
C. Plate like
D. Columnar.
2. Purplish colouration along edges of the leaf blade of young cereal plants is an indication of the deficiency of
A. Sulphur
B. Potassium
C. Phosphorus
D. Nitrogen.
3. Study the following diagram very carefully. It is a representation of a certain soil profile.



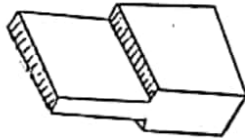
- A soil with such soil horizon differentiation is
- A. Young soil
B. Semi-mature soil
C. Mature soil
D. Old soil.
4. Suppose you are told to investigate a case whereby the vegetation on a certain swampy area is dead with the appearance of black organic matter residue. What would be the most likely conclusion of your investigation?
A. Presence of much sodium carbonate salt
B. Presence of much calcium hydroxide salt
C. The soil is saline
D. The soil is strongly acidic.

5. The smallest stomach chamber in ruminant animals is the
A. Reticulum C. Abomasum
B. Omasum D. Rumen.
6. How much quantities (in kg) of maize and groundnut meal will you have to mix in order to obtain a 100 kg ration of 20% protein, if you are provided with maize meal containing 10% protein and groundnut meal containing 40% protein?
A. 66.6 kg maize + 33.4 kg groundnut meal
B. 66.7 kg maize + 33.3 kg groundnut meal
C. 66.8 kg maize + 33.2 kg groundnut meal
D. 66.9 kg maize + 33.1 kg groundnut meal.
7. A mating method whereby a Friesian bull is crossed to a Zebu cow is known as
A. Out breeding C. In-breeding
B. Out crossing D. Progeny improvement.
8. Suppose one cow of Mr. Maulidi's herd of cattle is sick and shows symptoms of high temperature, laboured respiration, circling movements and convulsions, what is the most likely disease affecting the animal?
A. Anaplasmosis C. Heart water
B. Rinderpest D. Anthrax.
9. Suppose you observe that some tomato seedlings have fallen over the ground on certain nursery beds and the stems of affected plants at or near ground level are rotten. What appropriate measure would you undertake immediately?
A. Reduce the amount of nitrogenous fertilizer for application
B. Reduce the density of shade on nursery beds
C. Pull out the affected plants and throw them away
D. Avoid overwatering of the nursery beds.
10. The diagram below shows part of a coffee tree stump which has been attacked by a certain pest.



Which pest among the following is responsible for the attack?

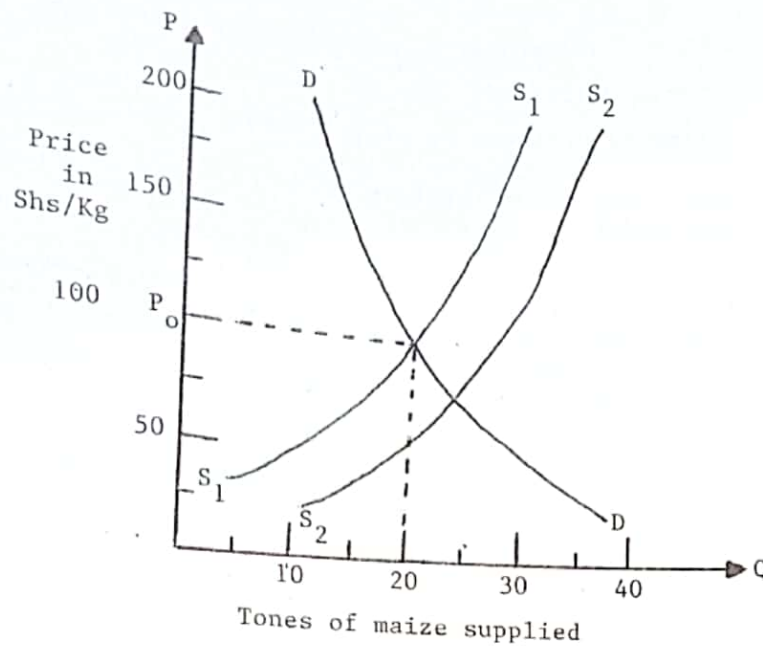
- A. Anthores leuconotus
 - B. Hypothenemus hampei
 - C. Apate SPP
 - D. Antestropsis Spp.
11. Which disease causes the appearance of a mass of sooty particles on cobs and panicles of attacked cereal crops?
- A. Smuts
 - B. Black sigatoka
 - C. Black powdery mildew
 - D. Cob or panicle rot.
12. Which of the following legumes have a higher ability of enriching the soil with nitrogen than others?
- A. Cow peas
 - B. Pigeon peas
 - C. Crotalaria spp (marejea)
 - D. Bambara nuts.
13. Which of the following is a primary tillage implement?
- A. Rotary plough
 - B. Tine cultivator
 - C. Disc harrow
 - D. Disc plough.
14. Which of the following is the use of a dieing tool in a farm workshop?
- A. Cutting threads
 - B. Cutting pipes
 - C. Cutting steel
 - D. Cutting metal.
- 15.



- Which type of saw among the following is used for cutting the joint shown in the above diagram?
- A. Cross cut saw
 - B. Tenon saw
 - C. Rip saw
 - D. Hack saw.
16. Which part in a petrol engine fuel system mixes petrol with air before the mixture is introduced in the combustion chamber?
- A. Injector pump
 - B. Carburetor
 - C. Atomizer
 - D. Intake manifold.

17.

- 5 -



The diagram above shows that after the supply curve shifts from S_1 to S_2 , 25 tones of maize are supplied on the market. If this shift is accompanied by a proportionate change in price of the commodity, what will be the equilibrium price?

- | | |
|--------------|---------------|
| A. 75 shs/kg | C. 85 shs/kg |
| B. 80 shs/kg | D. 90 shs/kg. |

18. A certain tractor model was sold at 15 million shillings on 1st Jan. 1996. If its life span is 20 years and its annual depreciation is 725,000 shs per year, what will be its value on 31st Dec. of the year 2,015?

- | | |
|---------------|----------------|
| A. 300,000.00 | C. 500,000.00 |
| B. 400,000.00 | D. 600,000.00. |

19. Which one among the following is the most correct definition of the term shadow prices?

- The price of a commodity sold on black market
- The farm gate price of a commodity
- The price of a commodity which fluctuate cyclically
- The price of a commodity under pure and perfect competition.

20. Which of the following genera of fish can be raised in a fish pond?

- Serranochromis, Haplochromis, Tilapia
- Stelothrisa, Haplochromis, Tilapia
- Serranochromis, Barbus, Tilapia
- Sardines, Haplochromis, Tilapia.

SECTION B

Nature of questions: short answer type

Marks allocated: 90 marks (90%)

Time allocated: 120 minutes.

Answer all questions. Credit will be given for answers which are precise, brief and to the point.

21. (a) The structure of soil depends very much on the relative amounts of two types of soil separates (particles). Name them.
- (b) State four characteristics of a soil dominated by the first type of soil separates you have named.
- (c) State four characteristics of another soil dominated by the second type of soil separates you have named.
22. (a) What is the difference between a straight fertilizer and a compound fertilizer? Name one example in each case.
- (b) The soil of one farm was analysed at Ukiriguru research station. The farm owner was advised to apply to the soils in his farm 80 kg N, 25 kg P_2O_5 and 15 kg K_2O per hectare in order to improve maize yields. How many kilograms of each of the following fertilizers should the farmer apply per hectare?
- (i) Sulphate of ammonia 21% N
- (ii) Triple super phosphate 48% P_2O_5
- (iii) Muriate of potash 60% K_2O .
23. (a) State the pH of and the types of salts constituted in:
- (i) saline soil (ii) alkali soil.
- (b) Suppose the soils in your school's vegetable garden are not salt affected and you use irrigation water for growing vegetables during the dry season. Enumerate three control measures that you will employ so that the soils in the garden remain salt free.
24. Suppose you have decided to keep poultry using the deep litter system and you have finished construction of a house for the purpose:
- (a) List any six types of equipment/materials which you will have to put in the poultry house in order to facilitate good husbandry.
- (b) List down any four symptoms that you will take into account when observing the occurrence of New Castle disease on a flock of chicken kept in the house.

25. (a) Enumerate any four qualities of colostrum that are important to the calf.
- (b) List down any three aims of drying-off in dairy cows.
26. (a) What do you understand by the term silage as it is used in fodder conservation?
- (b) List down four procedural tasks that you can undertake when you want to prepare good silage.
27. Suppose there are tomato seedling of a good variety which are being raised for sale at a nearby agricultural institution, explain very briefly in point form how you would raise a tomato crop using the following headings?
- (i) Preparation of beds for transplanting seedlings
 - (ii) Transplanting and spacing
 - (iii) Manuring and weed control
 - (iv) Pruning
 - (v) Rotation.
28. Write a brief account on how you can control the following in a sorghum field?
- (i) Birds
 - (ii) Sorghum shoot fly
 - (iii) Striga
 - (iv) American ballworm
 - (v) Stalk borer.
29. Give one most effective way of controlling each of the following diseases in the named crops:
- (i) Root rot disease in orange growing
 - (ii) Armillaria mellea in tea or coffee
 - (iii) Cassava mealybug in cassava
 - (iv) Gummosis on already affected orange plants
 - (v) Black sigatoka in bananas.
30. Give one main use for each of the following carpentry tools:
- (a) Dovetail saw
 - (b) Tenon saw
 - (c) Carpenters' ratchet brace with twist bit
 - (d) Pincers
 - (e) Sliding bevel.

31. (a) Briefly explain any four functions of lubricants in farm tractors.
(b) State the functions of the following in farm tractors:
(i) Governor (iii) Fly wheel
(ii) Throttle valve (iv) Engine cylinder.
32. (a) Explain what you understand by the term surveying as it is used in agro-mechanics and farm planning.
(b) List down any four surveying tools which are used in measuring horizontal distances between two points.
(c) Outline any four objectives of surveying.
33. (a) What do you understand by the term agro-forestry as it is commonly used today in agriculture?
(b) Outline any five main uses of agro-forestry which peasant farmers in Tanzania could benefit by practicing agro-forestry.
34. (a) Mention and describe briefly four types of agricultural prices.
(b) Describe briefly any six functions of price under conditions of pure and perfect competition.

35. At the beginning of an accounting year 30th December 1981, Kashaija evaluated his farm assets as follows:

The value of implements, buildings and land was 8,305/=.
Other assets were worth 4,225/=.
During the same year the following purchases were made:

- | | |
|---|----------|
| (i) 2 cows each costing | 1,802.50 |
| (ii) Sulphate of ammonia | 206.00 |
| (iii) Certified maize seed ... | 210.00 |
| (iv) Hand hoes | 105.00 |
| (v) Wages paid to 10 labours each | 200.00 |
| (vi) Other minor farm items .. | 550.00. |

The depreciation for buildings was estimated to be 320/= and for machinery was 165/=. In the same year the farm sold the following livestock products:

- | | |
|----------------------------------|----------|
| (i) 3 cows each | 2,500.00 |
| (ii) 5 goats each | 600.00 |
| (iii) 5 trays of eggs each | 105.00 |

At the end of year 1982, the value of the building, implements and land was estimated to be 6,005/= and that for other assets was worth 2,050/=. Prepare a Profit and Loss Account for Kashaija's farm as at the end of year 1982.