THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION

EXAMINATION 1995

034

AGRICULTURAL SCIENCE

(For both School and Private Candidates)

TIME: $2\frac{1}{2}$ Hours.

INSTRUCTIONS TO CANDIDATES

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 Examination Number on every page of your answer booklet you use.

This paper consists of 6 printed pages.

SECTION A

Nature of questions: Multiple choice
Marks allocated : 20 marks (20%)
Time allowed : 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 booklet provided.

1. In a soil profile, 'A' horizon is expected to have
   A. lower bulk density than 'B' horizon
   B. higher bulk density than 'B' horizon
   C. equal bulk density as 'B' horizon
   D. none of the above.

2. When the hydrogen ion concentraction in soil is higher than that of hydroxyl ions, the soil is:
   A. saline
   B. alkaline
   C. acidic
   D. neutral.

3. In which of the following soil pH ranges are micronutrient cations likely to be toxic to common plants?
   A. 10.0 - 13.0
   B. 8.5 - 10.0
   C. 6.5 - 7.0
   D. 3.5 - 5.0.

4. Given below are C : N ratios of four types of crop residues A, B, C and D. Which type of crop residue if added to the soil will be broken down at the fastest rate without causing immobilization of nitrogen already present in the soil?
   A. 20 : 1
   B. 30 : 1
   C. 40 : 1
   D. 50 : 1.

5. The quality of milk is expressed in terms of
   A. water content
   B. butterfat content
   C. protein content
   D. protein and mineral content.

6. The quantity of food required by animals to keep them alive without losing or gaining weight is called
   A. upkeeping ration
   B. maintenance ration
   C. supplimentary ration
   D. balanced ration.

7. The duration from conception to parturition in farm animals is termed
   A. destrus period
   B. calving interval
   C. parturition period
   D. gestation period.

8. When a male animal with genotype Aa mates with a female animal with genotype Aa, the probability of getting an offspring with genotype Aa is

A. $\frac{1}{8}$
B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. $\frac{3}{4}$

9. Which of the following materials can cause forking in carrots?

A. Farm yard manure
B. Urea
C. Calcium ammonium nitrate
D. Sulphate of ammonia.

10. Which of the following is commonly used as a planting material in sisal growing?

A. Suckers
B. bubils
C. Crowns
D. slips.

11. One of the following is an important pest of maize

A. Aphis crassivora
B. Anthoscelide obtectus
C. Dysdercus sp.
D. Cicadulina mbila.

12. The normal way of harvesting tea is to pick

A. four leaves and a bud
B. three leaves and a bud
C. two leaves and a bud
D. one leaf and a bud.

13. The device which connects and disconnects the engine to the rest of the transmission system is called

A. clutch
B. gear rod
C. cam shaft
D. crank shaft.

14. Greasing of nipples when undertaking daily maintenance of a tractor is important because it:

A. prevents rusting
B. reduces friction
C. facilitates movement
D. reduces drudgery.

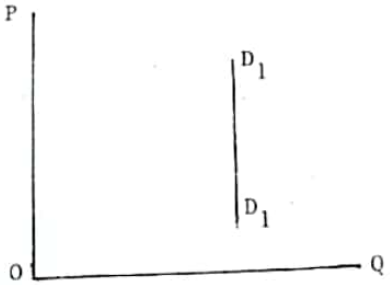
15. Which of the following is used to support metal work in the process of forging?

A. Bench vice
B. Bench hook
C. Tongs
D. Anvil.

16. Primary tillage impliments are normally used for

A. breaking soil clods
B. excavating soil
C. breaking up soil
D. pulverizing soil.

17. What type of demand does the following diagram illustrate?



A. Perfectly inelastic
B. Perfectly elastic
C. Elastic
D. Unit elasticity.

18. In a country with a mixed economy the prices of goods and services are controlled by

A. government regulations
B. supply, demand and government regulations
C. supply and demand
D. supply.

19. The relationship between the quantity of input used and quantity of output produced is known as

A. input-output relationship
B. input utilization
C. enterpreneurship
D. production function.

20. Which is the best period of harvesting honey in an aprary?

A. Beginning of flowering season
B. Middle of flowering season
C. End of flowering season
D. Before flowering begins.

SECTION B

Nature of questions : short answer type
Marks allocated : 80 marks (80%)
Time allocated : 120 minutes.

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

21. (a) Explain what is meant by the term porosity as used in soil science.
(b) Name and explain four factors which affect porosity.

22. (a) Define the term soil pH
(b) Explain briefly the agricultural importance of soil pH. Give four points.

23. (a) What do you understand by the term organic manures?

(b) Organic manures add nutrients and organic matter into the soil thereby helping in maintaining soil fertility. But the major problem in the tropics is that it is difficult to maintain a high level of soil organic matter. Explain why, giving only four reasons.

24. (a) Suppose the dam of a calf dies 3 hours after calving, how would you make artificial colostrum to the newly born calf?

(b) Explain how you could feed it to the calf.

25. (a) Give the meaning of hay.

(b) Briefly describe how you would make good quality hay on your farm.

26. (a) What is the main cause of anaemia in piglets?

(b) Explain four ways which you could use so as to prevent occurrence of anaemia in piglets.

27. (a) Pink bollworm is one of the pests which attack cotton.

(i) Name two parts of the cotton plant which are mostly attacked by the pest.

(ii) Describe the damage which the pest does to each of the plant parts you have named in (i) above.

(b) Name any two measures which can be used to effectively control the pest.

28. (a) Explain, giving examples, what you understand by mixed cropping.

(b) Explain three disadvantages of mixed cropping.

29. Using the following headings describe briefly how you would raise a crop of cotton:

(a) Land preparation
(b) Sowing and spacing
(c) Fertilizer application
(d) weeding and thinning
(e) Pest control.

30. Explain the function of <u>ANY SIX</u> of the following tractor parts:

(a) Oil filler cap
(b) Carburettor or injection pump
(c) Inlet manfold
(d) Exhaust manifold
(e) Radiator
(f) Fan and fan belt
(g) Battery
(h) Generator
(i) Gearbox and transmission
(j) Power take off.

31. Name a tool which is suitable for doing each of the following operations in a farm workshop

(a) Driving in and drawing out nails from wood

(b) Cutting metal

(c) Making small holes in wood or metal

(d) To check weather sides are at right angles

(e) To level or smoothen concrete or mortar

(f) cutting concrete.

32. (a) What is basin irrigation?

(b) Name two crops which can be irrigated using this method

(c) Give three disadvantages of using this method of irrigation.

33. (a) Mention four types of production/product relationships.

(b) Briefly explain the following:

(i) joint products

(ii) competitive products

(iii) supplimentary products.

34. Outline six methods which can be used to reduce risks and uncertainties in agricultural production.

35. In order to produce a porker weighing 600 kg in six months, every week the pig has to be fed on any of the combinations of boiled cassava roots and protein suppliment shown in the table below:

Kg. of casava roots (X_1)	Kg. of protein suppliment (X_2)
10	90
25	65
50	50
75	30
100	20
125	4

The cost for cassava roots is 3/= per kg. and that of protein suppliment is 5/= per kg. Using this data, determine the combination of cassava roots and protein suppliment which the farmer should feed to the pigs in order to produce a porker weighing 600 kg in six months.