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

034 AGRICULTURAL SCIENCE

TIME: 2½ Hours 9 November 1999 P.M.

INSTRUCTIONS

1. This paper consists of 13 questions in sections A, B and C
2. Answer **ALL** questions in sections A and B
3. Answer **ONLY ONE** question out of the three questions in section C
4. Read the instructions under each section carefully
5. All answers must be written in the answer booklet provided
6. Write your centre and index number on every page of your answer booklet
7. All writing must be in blue/black ink or ball point pen.

This paper consists of 8 printed pages.

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SECTION A

Nature of questions : Multiple choice and matching questions
Marks allocated : 20 marks, i.e. 10 marks for each question
Time allocated : 30 minutes

Answer all the two questions in this section.

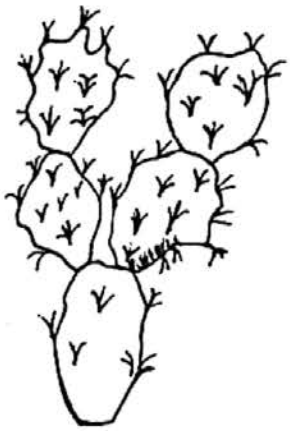
1. Under each of the questions below, only one of the five answers provided is correct. Write down the letter bearing THE CORRECT ANSWER in the booklet provided.

(i)

The damage made on this plant is caused by an insect known as:

A. Melanogromyza sp.
B. Beam bouchid
C. Atherigona indica
D. Stalk borer
E. Larvae of shootfly

(ii)



What is the name of the weed shown in this picture (on the left)?

A. Lautana camara
B. Sow thistle
C. Starbur
D. Opuntia sp.
E. Double thorn

(iii) The hereditary unit which carries the characteristics of an individual is called:

A. Chromosome
B. Gene
C. Hereditary unit
D. Hereditary particle
E. Mitochondria

(iv) White yellowish or green yellowish diarrhoea in chicken is a symptom of a disease called:

A. Coccidiosis B. Newcastle C. Fowl typhoid D. Pneumonia
E. Fowl cholera

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(v) Soil analysis on Mrs Bugeke's farm showed that the pH was 8.5. Which of the following methods should she use to reduce the pH?

A. Eradication, conversion and control
B. Conversion, control and neutralization
C. Eradication, leaching and drainage
D. Eradication, conversion and fixation
E. Heavy manuring, eradication and conversion

(vi) What is the percentage pore space of a soil whose Bulk density is 1.3g/cc and particle density of 2.65g/cc?

A. 31% B. 41% C. 51% D. 61% E. 71%

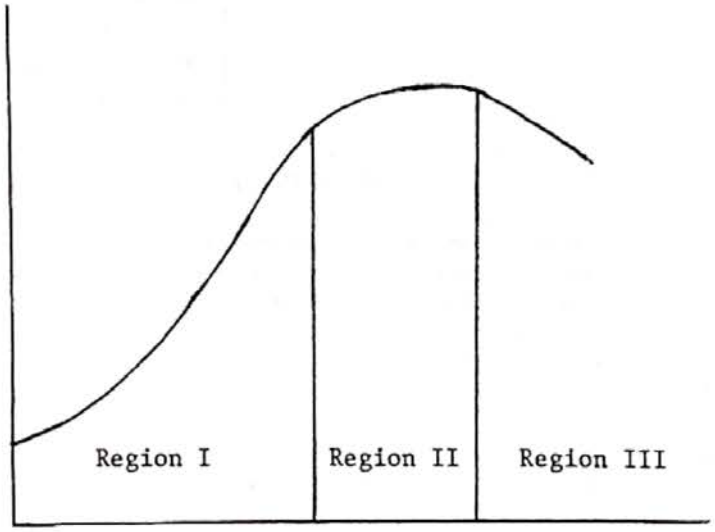
(vii) In how many revolutions of a crank shaft does a four stroke cycle engine complete its four strokes (induction, compression, power, exhaust)?

A Four revolutions (1440°)
B. Two revolutions (720°)
C. Three revolutions (1080°)
D. One revolution (360°)
E. Half a revolution (180°)

(viii) If the supply of tomatoes falls from 50kg to 20kg and the price per kg. increases from shs.10.00 to shs.20.00, the elasticity of supply (Es) will therefore be:

A. 0.6 B. 1.0 C. 0.8 D. 0.6 E. 0.4

(ix) The diagram below shows a production function with three regions of production, i.e. regions I, II and III



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The best region where one should produce is

A. II B. I C. I and II D. III E. II and III

(x) A tool used to indicate a vertical position of a point, for example in chaining long slope is:
A. Ranging pole B. Chain C. Plumb bob D. Chaining arrow
E. Pins

2. On the line to the left of each of the long statements in column A, write the letter representing the word or short statement from column B which most correctly matches with the statement in column A. Each word or short statement from column B may be used once, more than once or not at all.

COLUMN A	COLUMN B
(i) Causal organism of East Coast Fever	A. A – horizon
(ii) Animal with four chambered stomach	B. Aluminium ions
(iii) A pest of bean plants in the field	C. Average product
(iv) Horizon of aluviation in soil	D. B-horizon
(v) A source of acidity formation in soils	E. Complimentary products
(vi) A process of hardening steel	F. Composite stomach
(vii) Controls ploughing depth on oxen drawn plough	H. Helopeltis scheutedeni
(viii) Change in the quantity of total products over change in quantity of input	I. Hydrogen gas
(ix) Production of cotton seed and cotton seeds	J. Joint products
(x) Acanthospermum hispidum	K. Land wheel
	L. Marginal product
	M. Melanagromyza phaseeli
	N. Nature of soil
	O. Ploughing depth
	P. Polygastric
	Q. Starbur
	R. Streptococcus spp.
	S. Tempering
	T. Theileria parva

SECTION B

Number of questions : 8 questions
Nature of questions : short answer type
Marks allocated : 60 marks (60%)
Time allocated : 60 minutes

Answer all questions in this section. Answers should be brief, precise and to the point.

3. The drawing below shows five plots in a garden. Each plot is planted with a different type of vegetable crop.

Plot 1	Plot 2	Plot 3	Plot 4	Plot 5
Peas	Cabbage	Carrots	Egg plants	Lettuce

First season planting

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(a) If the owner of the garden is practising crop rotation, which crop should she/he plant in plot 3during the fourth season?

(b) Among the vegetable crops in the above diagram, name 2 of them which are heavy feeders and 2 which are light feeders.

4. The plant in one picture below was found growing in large numbers in a maize field.

(a) What would you call the presence of this plant in the maize field?

(b) Outline any 6 harmful effects of such plants in field crops generally

5. (a) Define animal breeding

(b) Name and briefly explain any three livestock breeding methods

6. The table below shows the characteristics of soils A, B and C.

Soil characteristics	Soil A	Soil B	Soil C
Texture	Very fine	Coarse	Fine to coarse
Aeration	Poor	Good	Moderately good
Water holding capacity	Very high	Low	Medium
Nutrient holding capacity	Very high	Low	Medium

(a) Identify soils A and B

(i) A _____

(ii) B _____

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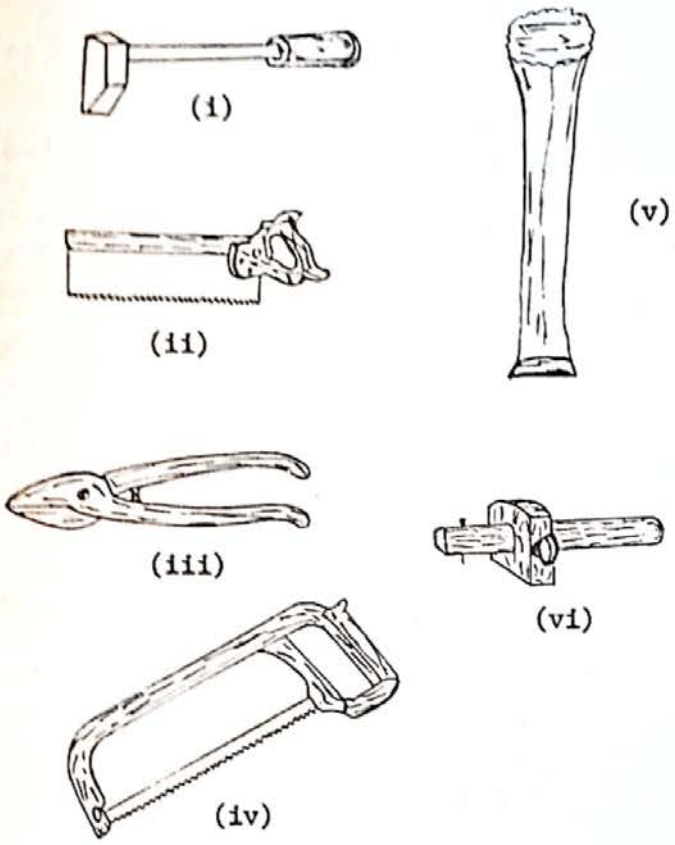
(b) How would you improve the water holding capacity of B? List down five ways.

7. Suppose you were given the tools shown in the diagrams below for use in a practical test.



(a) What is the name of each tool?
(b) What use would you demonstrate for each one?

8. (a) Define the following terms as used in surveying.

(i) Levelling
(ii) Bench mark (BM)

(b) The diagram below shows a type of levelling which was done by a survey class in a school farm. Find the missing figures in the blanks numbered (i) - (vi) and check the correctness of your answer using the formula:
$\Sigma B S - \Sigma F S$ = Final elevation - Initial elevation
NOTE: B = Back Sight
FS = Fore Sight
HI = Height of Instrument
BM = Bench Mark

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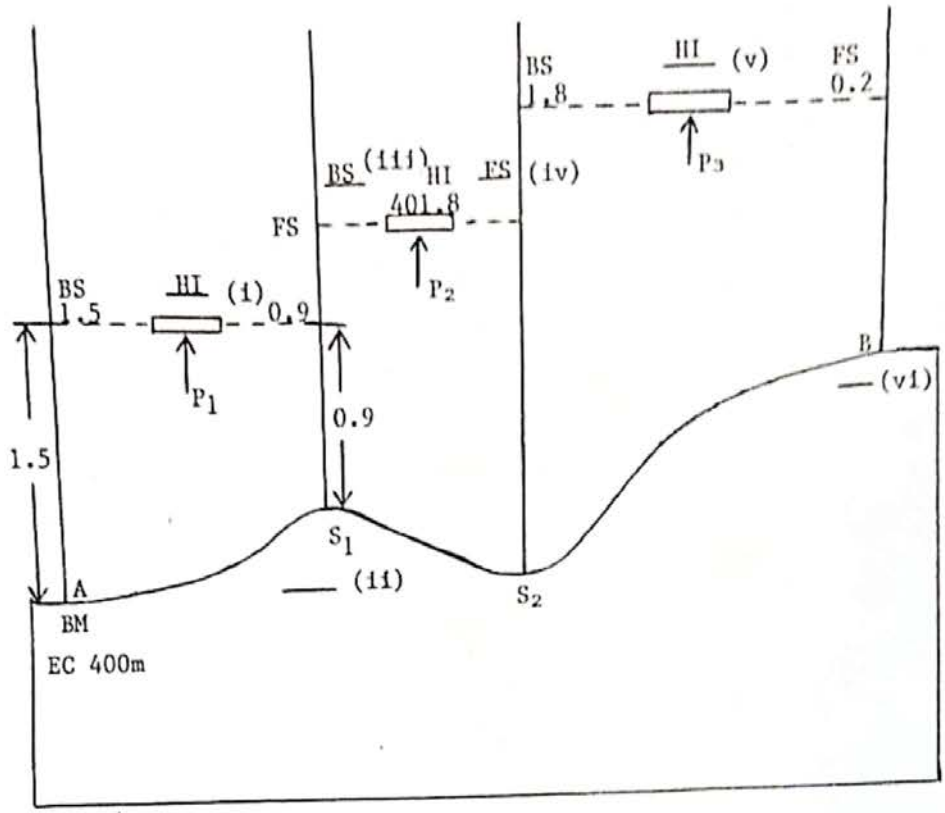

9. (a) Define the term "Elasticity of demand (Ed)" as used in agricultural economics.

(b) Make graph sketches to illustrate the following:

(i) Inelastic demand
(ii) Inelastic supply
(iii) Elastic demand
(iv) Elastic supply
(v) Unitary elastic demand
(vi) Unitary elastic supply

10. (a) Define the term "Agroforestry".

(b) List down any 6 characteristics of an ideal agro-forestry tree spiecies.

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SECTION C

Number of questions	:	3 questions
Nature of questions	:	Essay type questions
Marks allocated	:	20 marks (20%)
Time allocated	:	30 minutes

Answer ONLY ONE question in this section. Credit will be given for answers which are precise, brief and to the point.

11. Suppose you are running a small scale poultry project where you keep layers. One day you observed the following symptoms on few birds in the flock:

    - Dullness, coughing, sneezing and gasping
    - Profuse greenish diarrhoea
    - Paralysis of legs and wings
    - Twisting of the neck and backward somersault movement

    (a) Suggest the possible disease attacking your birds and the causative organism
    (b) Suggest at least two control measures
    (c) Explain at least four ways of transmission of the disease

12. (a) Define the term "budding",
    (b) Briefly outline nine steps of the procedure of budding from the beginning to the end of the process.

13. (a) (i) Define the term "Gross margin" as used in agricultural economics
    (ii) Outline the three steps which are involved in the calculation of gross margin of an enterprise

    (iii) In 1997 Mbwewe Secondary School raised 20 hectares of paddy. The cost of seeds was 2,000/= and fertilizers and insecticides was 8,500/=. Planting, weeding and harvesting were done by students. Their labour contribution was valued at 30,500/=. All the paddy was consumed by students themselves on the basis of "self-reliance". A total of 500 bags each valued at 1,500/= had been harvested. Calculate the gross margin per hectare.

    (b) (i) Define the term "agricultural marketing"

    (ii) Outline eight types of middlemen who exist in agricultural marketing.

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