

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

134/1

SCIENCE AND PRACTICE OF AGRICULTURE 1
(For School Candidates Only)

Time: 2:30 Hours

Tuesday, 9th February 2010 a.m.

INSTRUCTIONS

1. This paper consists of **ten (10)** questions in sections A, B and C.
2. Answer **five (5)** questions choosing at least **one (1)** question from each section.
3. Each question carries **twenty (20)** marks.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

This paper consists of 5 printed pages.

CBA-2011-2013

SECTION A

AGRICULTURAL ENGINEERING AND LAND PLANNING

1. (a) Name and state eight (8) parts of one unit of a row - crop planter and explain briefly the function (s) of each part. **(8 marks)**
(b) Outline the procedure of calibrating a ground- wheel- driven row crop planter. **(7 marks)**
(c) Suppose a 5 x 0.10 m drill is to plant 100 kg of rice seeds per hectare. If the diameter of its drive wheel is 1 m, calculate:
(i) the width of the seed drill.
(ii) the length of travel necessary for the drill to cover 0.2 hectare.
(iii) the number of wheel revolutions to cover 0.2 hectare.
(iv) the amount of seed that should be delivered from each tube to plant 0.2 hectare. **(5 marks)**
2. (a) (i) Briefly explain four (4) causes and four (4) effects of soil erosion.
(ii) Name two (2) mechanical structures that may be used to control soil erosion on the farm. **(10 marks)**
(b) Discuss the agronomic practices which may be used by farmers to control soil erosion on their farms. **(10 marks)**
3. (a) Distinguish between soldering and welding. **(2 marks)**
(b) For what purpose would you use each of the following in the farm workshop?
(i) Blow torch
(ii) Tin snips
(iii) Sliding bevel
(iv) Forge
(v) Jackplane
(vi) Sledge hammer
(vii) Goggles
(viii) Hacksaw. **(8 marks)**
(c) (i) How are metal files classified on the basis of their roughness?
(ii) State six (6) types of metal files which are used in a farm workshop. **(5 marks)**
(d) Why are the following fittings necessary in plumbing work?
(i) Elbow
(ii) Tee
(iii) Union
(iv) Nipple
(v) Coupling.

(5 marks)

4. (a) Give a brief account on each of the following terms as used in Surveying.
- (i) Levelling
 - (ii) Contour
 - (iii) Pacing
 - (iv) Scale.
- (4 marks)
- (b) When surveying agricultural land the surveyor makes direct linear measurements. In making such measurement gross error as well as systematic errors may be done. Describe the sources of each of these two types of errors.
- (8 marks)
- (c) List four (4) survey instruments which are used by surveyors when chaining or taping and state the function of each instrument.
- (8 marks)
5. Describe ten (10) safety rules that you have to observe when working in the farm workshop.
- (20 marks)

SECTION B

SOIL SCIENCE

6. (a) Explain briefly the meaning of each of the following terms:
- (i) Soil colloids
 - (ii) Soil pH.
- (5 marks)
- (b) What are the source of H^+ ions and OH^- ions which are normally present in the soil solution?
- (8 marks)
- (c) What is likely to be the reaction of soils in areas which receive high average annual rainfall and those which receive low average annual rainfall?
- (4 marks)
- (d) What is the effect of soil pH on the solubility of iron, aluminium and manganese in the soil and their availability to plant roots?
- (3 marks)
7. (a) What is the difference between soil salinity and soil alkalinity?
- (4 marks)
- (b) Write an account on how soil alkalinity and salinity may develop in the soil of a given area.
- (4 marks)
- (c) Describe briefly four (4) effects of soil alkalinity on the growth of crop plants.
- (8 marks)
- (d) State two (2) methods of correcting the pH of saline or alkaline soils so that such soils become suitable for plant growth.
- (4 marks)

8. (a) (i) Mention four (4) factors that determine the fertility of the soil.
(ii) Explain briefly four (4) ways in which the soil can lose its fertility. (10 marks)
- (b) Why is water important in the soil? (2 marks)
- (c) Explain four (4) agronomic practices that you could use in order to conserve moisture in the soil on the farm. (8 marks)

SECTION C

RURAL ECONOMY

9. (a) Explain briefly each of the following terms as used in Rural Economy.
(i) Gross output
(ii) Variable costs
(iii) Gross margins
(iv) Fixed cost. (8 marks)
- (b) Explain briefly four (4) ways in which profits may be raised on the farm through gross margin analysis. (8 marks)
- (c) A farmer planted four hectares of maize. In raising the maize the farmer bought seeds worth 15,000/=, fertilizers worth 100,000/= and insecticide worth 5,000/=. Weeding costs were 50,000/= and costs of harvesting were 50,000/=. The total yield was 100 bags @ 100 kg. The shelled maize was bought by Mohamed Enterprise at a price of 150/= per kg. Calculate the gross margin per hectare. (4 marks)
10. (a) Define the following terms:
(i) Wholesalers
(ii) Marketing channel
(iii) Marketing efficiency. (6 marks)
- (b) Briefly explain the differences between marketing costs and marketing margins. (4 marks)
- (c) In one year a research was conducted so as to determine the prevailing costs of marketing maize which is produced in Iringa and then sold at Kariakoo market in Dar es Salaam. The findings were as follows:
- | | |
|---------------------------|----------|
| Payment to producers | 8000/= ✓ |
| Transport to Kariakoo | 1500/= |
| Storage charges | 800/= |
| Insurance | 500/= |
| Interest on loan | 500/= |
| Other charges | 900/= |
| Selling price at Kariakoo | 17,000/= |

From the data given calculate:

- (i) The marketing cost of 1 bag of maize.
- (ii) The profit margins obtained after selling one bag of maize at Kariakoo market.

(6 marks)

- (d) Explain the effects of high marketing margins to both producers and consumers.

(4 marks)