CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZJES)

FORM SIX PRE-NATIONAL EXAMINATIONS 2023
134/1 AGRICULTURE 1
MARKING SCHEME

1. (a)

  i. *Land tenure system*; land tenure system like land fragmentation which give rise to scattered small plots do not justify the purchase of the sophisticated machinery as such the farmer stick to simple and small tool

  ii. *Farmers are conservatives*; unwilling to adopt new methods and innovation

  iii. *Low income per capital;* peasant farmers and other low salary earners who are interested in farming cannot afford to buy heavy tools and machinery.

  iv. *High prices and taxation*; imposed by government on improved machinery discourage poor farmers from buying them.

  v. *Farmers lack skills and training to handle modern machine.*

  vi. *Communication difficulties have hampered effective advertisements and demonstration of the use of machines to farmers.*

  Any five points 1 mark @ = **05 marks**

(b) i) kill harmful pathogens such as bacteria, fungi, viruses and nematodes and they can infect the plants

 (ii) to remove salts from water as they can hinder the growth of plants.

 (iii) prevent corrosion of irrigation pipes as water can contain chemical that can corrode the pipes

 (iv) to avoid emitters to avoid blockage from suspended soil particles and other impurities.

 (v) to neutralize acid that may kill the crop by adding limes.

   1 mark @ = (**05 marks**)

2. (a) Grades of files

   (i)   Rough file: contain eight teeth per cm and used for rough work

(ii)   Bastard / Rasps file: Contain 12 teeth per cm for rough work

(iii)   Secord cut file: Contain 16 teeth per cm for finishing work

(iv)   Smooth file: Contain 20-24 teeth per cm used for finishing work

(v)   Dead smooth file: Contain 25 – 40 teeth per cm used for finishing work .

(1mark @ =**05 marks**)

(b) Factors that influence selection of building materials

(i)   Purpose of building: Such as homestead poultry, piggery or cattle shed

(ii)   Strength and durability of materials the reduce maintenance cost

(iii)   Availably of the materials: Locally available or hot

(iv)   Climate: Good thermal insulator materials when heather is hot

(v)   Bulkiness of the materials to reduce transport cost

(vi)   Price of materials _Reasonably how price material is acceptable.

(vii) Dimension specification - Needs of materials for specific uses

(viii) Decorating purposes

(ix)   Availability of skill personal to install the materials

(x)   Compatibility of materials during installation (any 6 marks)

Any five (05) points = 05 marks

3. (a) (i)   Four ways of correcting a deficit in balance of payment

-    Asking foreign countries/ debtors to pay back loans

-    Selling foreign investments

-    Withdrawing from accumulated reserves such as DMF

-    Borrowing from foreign governments from foreign monetary institution such as IMF

1 Mark @= **4 marks**

(b) Factors to observed before and during farm planning

(i)   The size of the farm

(ii)   The number of enterprises

(iii)   The topography of the land

(iv)   The climate or the area

(v)   The type and fertility of soil

(vi)   The availability of various infrastructure such as road water, supply and electricity

(vii) The exist in building (any 6 points @ 1 mark= **06 marks**

4. SOLUTION

a) percentage base saturation

$\%\text{BS} = \dfrac{\text{Exchangeable bases(k,Na,Can,Mg,Mn)/}}{\text{CEC}} \, x \, 100\%$ (**01 marks**)

$\%\text{BS} = \dfrac{exchangeable\ bases(10+38.0+20.2+2.0}{96meq/100} x100.$

$\%\text{BS} = \dfrac{74}{96\text{meq/100g}} \, x \, 100\%$ (**02 marks**)

$\%\text{BS} = 77\%$ (**02 marks**)

b) The quantity of calcium in gram present in 100 grams of oven dry soil

Let's find the gram milliequivalents weight of calcium.

Gram equivalent weight $= \dfrac{\text{Atomic weight}}{\text{valency}}$

Gram eq weight= 20g/eq. (**01 marks**)

But gram mill equivalent weight $= \dfrac{1}{1000}$ of its gram equivalent weight.

Gram milliequivalents weight $= \dfrac{1}{1000} \, x \, 20 = $ **0.020g/meq (01 marks)**

But then there are 38 meq of calcium in our question

1meq of Ca $= 0.020$g

  38meq $=$?

You cross multiplication $= \dfrac{38\ meq \times 0.020g}{1meq}$ (**01 marks**).

Therefore, the quantity of calcium in 100g of oven dry soil is *0.76g* (**02 marks**)

5. (a)

i.   Soil texture: the negatively charged clay colloids attract positively charged cation and hold them. Therefore, the action exchange capacity of soil increases with increase in percentage of clay content. Clay soil with high CEC can retain large number of cations and reduce the loss of cation by leaching.

ii. soil organic matter High organic matter content increases CEC. The CEC of clay minerals range from 10 to 150[cmol(P^+)Kg^{-1})] and that of organic matter ranges from 200 to 400[cmol(P^+) Kg$^-$]

iii. Nature of clay minerals: the CEC and specific area of the clay minerals are in the order: smectite>fine mica>kaolinite. Hence the CEC of a soil dominated by smectite type of clay minerals is much higher than kaolinite type dominating soils.

iv. Soil reaction: as the pH is raised the Hydrogen held by the organic colloids and silicate clays (kaolinite) become ionized and replaceable. The net result is an increase in the negative charge on the colloids and in turn an increase in CEC

(4 marks, 1 mark@)

b). (i) size

  (ii) Surface area

  (iii) surface charge

  (iv) Adsorption of cation

  (v) cohesion

  (vi) adhesion

  (vii) swelling and shrinking

  (viii) Dispersion and flocculation

  (ix) plasticity

  (x) Brownian movements

*Any six (06) points (**06 marks**)*
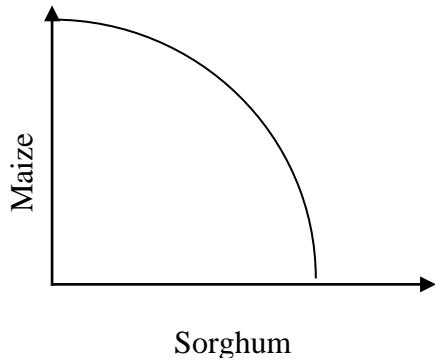
6. (a) Products – Products relationship

a.   Joint products

       Given Quantity of one product is produced the quantity of other product is fixed by nature example   beef and hide.

Hide
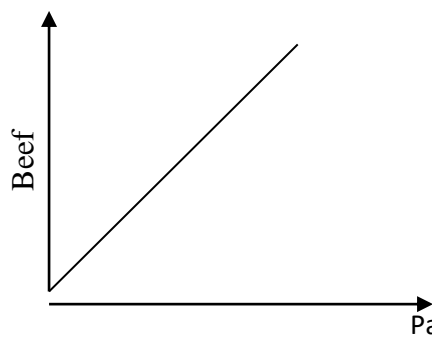
(ii)   Competitive products: Production one product increase, leads to the decrease
   of other product e.g., maize and sorghum.

Maize (vertical axis), Sorghum (horizontal axis)

(i)   Complementary products

          Increase in the production one product head to an increase in the production of other
          product re fodder and milk.

Fooder (vertical axis), Milk (horizontal axis)
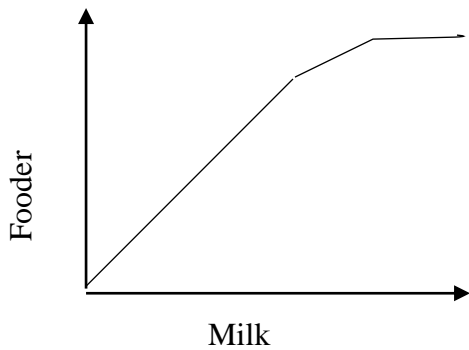
(ii) Supplementary products.

      Increase or decrease in the productive on the one product has no effect on the
      production of the other product e.g., goats and cattle. 4 marks
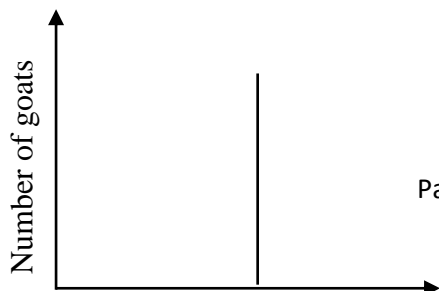
Number of goats (vertical axis)

Number of cattle

(b) Four characteristics of labour

- Labour is supplied only by living things such as human being which is affected by social problems.
- Labour is not transferable between people
- Labour can choose what to do and how long to do
- Labour can move from low paying sector to high paying sectors during peak period)

Any three (03) points = **(03 marks)**

(ii) Labour productivity can be improved through the following ways.

- Training labour improve efficiently
- Provission of incentive /motivation
- Provission of piece work
- Mechanizing them

Any three (03 points) **(03 marks)**

7. (a) i) – to make tire last longer

- to make it easy to control the tractor. 1 mark @ = **02 marks**

ii) – To make the rear wheel bigger in size

- to make heavy thread on rear wheel.
- to adjust tire pressure

Any two points = **02 marks**

(b) i) Proper working strategies e.g., the time of the day.

ii) avoid seasonal use of working animals. To keep them exercised throughout the year.

iii) proper care and management. E.g,. Good shelter,

iv) proper feeding strategies.

v) proper treatment and vaccination.

Vi) improve harnessing system

vii) improve genetic potential for existing livestock.

Any six (06) points = **06 marks**

8. **(a)** (i) it determines workability and erodibility of the soil

    ii)   affect water holding capacity and storage for plant growth

    iii) Affect soil temperature

    iv) Affect plant nutrient holding capacity

    v) Affect drainage, aeration and root penetration.

    vi) It influences microbial activities

  1mark @= **06 marks**

  (b) i) grow cover crop

    ii) practice conservation tillage to incorporate organic matter

    iii) addition of organic manure

    iv) addition of organic mulch material

  1mark @=**04 marks**

9. (i) low production and storage technology

  ii) nature of the product.

  iii) fluctuation of currency exchange rate

  iv) poor infrastructure.

  v) seasonal production.

  vi) government regulation.

  vii) Change in climatic condition.   Any five points = **05 marks**

b) i) the use subsides

  ii) the use of international commodity agreement

  iii) the use of buffer stock fund.

  iv) diversification of product.

  v) use of stabilization fund through organized marketing board.

  1mark @= **05 marks**

10 a) i) soil organic matter content

  (ii) Level of granulation

  (iii)soil structure

(iv) cultural /agronomic practices

(v) level of compactness

any four (04) = **04 marks**

b) Solution

➢ Volume of the soil = 2cm x 2cm x 2cm **= 8cm³ (01marks)**

➢ particle density = 2.65g/cc

➢ weight of the oven dry sample =14g

Bulk density(BD) = $\frac{weight\ of\ the\ ovendry\ soil\ (g)}{total\ volume\ of\ soil\ (cc)}$ (01 marks)

BD = $\frac{14g}{8cm3}$ = **1.75$g/cm3$ (01 Mark)**

To calculate percentage pore space

% pore space = $\left(1 - \frac{BD}{PD}\right)100$ **(01 marks)**

% pore space = $(1 - \frac{1.75g/cc}{2.65g/cc})100$

∴ % *pore space is equal to* **34**% **(02 marks)**