**UACE P515/3 Principles and practices of agriculture2 2018**

**2 hours**

**Instructions**

Answer all questions

1. You are provided with specimens A, B C and D which are pasture plants.
   (a) Give two common feature of
      (i) Specimens A and D (02marks)

      ……
      ……

      (ii) Specimens B and C

      ……
      ……

   (b) (i) Using a razor blade, cut one of the features on the roots of specimen D into two and observe the cut surface using a hand lens. Record your observations
      ……
      ……
      (ii) What conclusion can be drawn from the observations in (b)(i)?

      ……
      ……

   (c) Give two possible combination of the specimen in a pasture (01mark)
      (i) ……
      ……
      (ii) ……
      ……
   (d) State the basis of the combination in (c) (01mark)

……
……

(e) Suggest the method of propagation of each specimen (02 marks)

……
……

2. You are provided with specimens E, F, G, H and I which are workshop tools

(a) Describe how the specimens are suited for their functions (04marks)

E ……

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F ……

……

G ……

……

I ……

……

(b) Describe how specimens E, F, G and I can be used to produce suitable pieces of H for construction of a feeder. (02 marks)

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(c) Suggest possible problems encountered in the use of E, F, G and H

E ……

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F ……

……

G ……

……

H ……

……

(d) Suggest the methods of maintaining specimens E, F and G in good conditions (02marks)

E ……

……

F ……

……

G ……

……

3. Specimens $H_1$, $H_2$ and $H_3$ were taken from a farm animal

(a) (i) To which system of the animal do they belong? ( ½ mark)

……

(ii) Name the type of animal from which the specimen were obtained

……

(b) (i) Using a knife cut open specimen H1 H2 and H3, examine and describe the content of each specimen. (03marks)

$H_1$ ……

……

$H_2$ ……

……

$H_3$ ……

……

(ii) From the nature of the contents observed, state the function of each specimen. (1 ½ marks)

$H_1$ ……

……

$H_2$ ……

……

$H_3$ ……

……

(c) Remove the contents from each specimen and examine the inner surface.

(i) Describe the structure of each specimen (1½ marks)

$H_1$ ……

……

$H_2$ ……

……

$H_3$ ……

……

(ii) Explain how the observed structure of each specimen facilitates it proper functioning. (03marks)

$H_1$ ……

……

$H_2$ ……

……

$H_3$ ……

……

4. You are provided with soil samples J and K and substance L

(a) Measure 5cm3 of each of J and K in separate boiling tubes labeled J and K respectively. Add $10cm^3$ of water to each boiling tube and stir with a glass rod and leave to stand for 10 minutes. After 10 minutes, record your results for each boiling tube. (02marks)

(i) Boiling tube J

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……
……

(ii) Boiling tube K

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……
……

(b) Pour out contents from boiling tube labeled J and label it $K_1$. Put into it $10cm^3$ of specimen K followed by a leveled spoonful of substance L, then $10cm^3$ of water. Stir the contents in the boiling tubes $K_1$ and K again and leave to settle for 10 minutes. After 10 minutes record your observation (02 marks)

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……

(c) Explain the difference observed in test tubes K and $K_1$ stated in (b)

……
……

(d) From the observation state the role of substance L when added to soil (02marks)

……
……

(e) Suggest three ways in which substance L is important in crop production. (03marks)

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……
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……

5. Specimen P, Q, R and S are damaged plant parts

(a) Examine the specimens and state the damage and its cause, for each specimen in table 1 (04marks)

Table 1

| Specimen | Damage | Cause of damage |
|---|---|---|
| P | | |
| Q | | |
| R | | |
| S | | |

(b) (i) give two effects of each damage on each of specimen P and S on the crops (02marks)

P ……

……..

S ……

……..

(ii) State one control measure for the damage on each of the specimens (04marks)

P ……

……..

Q ……

……..

R ……

……..

S ……

……..

End

**Confidential material**

Each student should be provided with

Centrocema pubescens (centro), labeled A

Elephant grass, labeled B

Rhodes grass, labeled C

Silver leaf Desmodium, labeled D

G-clamp, labeled E

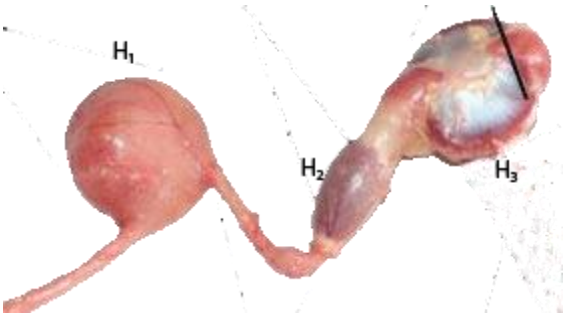
Hand saw, labeled F

Smoothing plane, labeled G

Piece of timber measuring 12’ x 1’, which is 2 metres long, labeled H

Tape measure labeled I


The following parts of chicken with their contents




Crop, labeled $H_1$

Stomach, labeled $H_2$

Gizzard, labeled $H_3$

$20cm^3$ sand soil, labeled J

$20cm^3$ clay soil, labeled K

Heaped table spoonful of lime labeled L

Coffee leaf destroyed by leaf miner, labeled P

Coffee leaf attacked by coffee rust labeled Q

Bean seeds damaged by weevils, labeled R

Bean

Cassava plant leaves infected with mosaic, labeled S

Stop clock

Glass rod

2 boiling tubes

Beaker (250$cm^3$)

Knife

Table spoon

## Suggested answers

1. You are provided with specimens A, B C and D which are pasture plants.
   (a) Give two common feature of
      (iii) Specimens A and D (02marks)

      Network veins

      Trifoliate leaves

      Have root nodules

      (iv) Specimens B and C

      Parallel veins

      Fibrous root

   (b) (i) Using a razor blade, cut one of the features on the roots of specimen D into two and observe the cut surface using a hand lens. Record your observations
      Dark spots observed in centre.
      (ii) What conclusion can be drawn from the observations in (b)(i)?

         Contain symbiotic bacterial that fix nitrogen

   (c) Give two possible combination of the specimen in a pasture (01mark)
      (i) A and B
      (ii) A and C
      (iii) D and B
      (iv) D and C
   (d) State the basis of the combination in (c) (01mark)
      Grass and a legume providing
      - Balanced nutrition (grasses are high in fibres while legumes are high in proteins
      - Improved digestibility
      - Reduced risk of bloat in cattle and sheep

   (e) Suggest the method of propagation of each specimen (02 marks)
      - A (centro) is propagated by sowing seed
      - B (elephant grass) is propagated by stem cutting, stolon, seed
      - C(Rhode grass) is propagated by seeds and stolon
      - D(silver leaf Desmodium) by seed
2. You are provided with specimens E, F, G, H and I which are workshop tools
   (a) Describe how the specimens are suited for their functions (04marks)

E (G-clamp):

- made of strong metal to withstand compression;
- G-shaped to apply pressure evenly across the work piece;
- has fixed jaws to provide stability and strength to the assembly;
- screw mechanism to apply adjustable pressure.

F(hand saw).

- Can cut many materials such as wood and plastic;
- can be used in remote areas because it does not required power;
- thin blade to reduce wastage of material cut; portable
- straight blade to avoid sticking

G (smoothening plane)

- sharp cutting edges to remove thin layer from wood
- Has firm plane body to withstand stress
- Has handle to guide and push plane
- Has adjustment wheel to adjust depth of the blade

I (tape measure)

- Calibrated to measure length

(b) Describe how specimens E, F, G and I can be used to produce suitable pieces of H for construction of a feeder. (02 marks)
E hold H strongly on the base to enable it be smoothed by G or cut to pieces by F; while I is used to make accurate measurement

(c) Suggest possible problems encountered in the use of E, F, G and H

E (G-clamp)

- Over tightening damaging H
- Dull blade
- Shavings clog the mouth of the plane.
- Wear and tear making it un-effective

F(hand saw).

- Bent blade and saw not sharp causing blade sticking
- Damaging H due to inappropriate use
- Uneven cuts

H (wood).

- Natural defects like knots, splits, and warping can affect the quality of your project

(d) Suggest the methods of maintaining specimens E, F and G in good conditions (02marks)

E- Regular cleaning; lubricate, keep dry

F – oil blade; sharpen blade; keep in dry places to prevent rusting

G – oiling, sharpening blade; cleaning

3. Specimens $H_1$, $H_2$ and $H_3$ were taken from a farm animal

(d) (i) To which system of the animal do they belong? ( ½ mark)
Digestive system
(ii) Name the type of animal from which the specimen were obtained
poultry

(e) (i) Using a knife cut open specimen H1 H2 and H3, examine and describe the content of each specimen. (03marks)

$H_1$ contains moistened undigested feeds

$H_2$ – watery feed partially ground

$H_3$ – finely ground feed mixed with grit

(ii) From the nature of the contents observed, state the function of each specimen. (1 ½ marks)

$H_1$ - storage

$H_2$ – grinding/digestion begins

$H_3$ - for grinding, mixing, and mashing.

(f) Remove the contents from each specimen and examine the inner surface.
(iii) Describe the structure of each specimen (1½ marks)

$H_1$ - has slippery elastic layer

$H_2$ – has soft glandular layer

$H_3$ - Has thick horny layer

(iv) Explain how the observed structure of each specimen facilitates it proper functioning. (03marks)

$H_1$ – slippery elastic layer enables extension to store food

$H_2$ – glandular layer produces digestive fluids

$H_3$ - thick horny layer protects the strong muscles while grinding food with the help of grits

4. You are provided with soil samples J and K and substance L
   (a) Measure $5cm^3$ of each of J and K in separate boiling tubes labeled J and K respectively. Add $10cm^3$ of water to each boiling tube and stir with a glass rod and leave to stand for 10 minutes. After 10 minutes, record your results for each boiling tube. (02marks)
      (i) Boiling tube J
      Fully settled with clear water above
      (ii) Boiling tube K
      Partially settled with cloudy water above
   (b) Pour out contents from boiling tube labeled J and label it $K_1$. Put into it $10cm^3$ of specimen K followed by a leveled spoonful of substance L, then $10cm^3$ of water. Stir the contents in the boiling tubes $K_1$ and K again and leave to settle for 10 minutes. After 10 minutes record your observation (02 marks)

   $K_1$ settled faster forming a clearer solution above than K

   (c) Explain the difference observed in test tubes K and $K_1$ stated in (b)

   L cause clumping together small particles in K to form bigger particles that settled faster under gravity

   (d) From the observation state the role of substance L when added to soil (02marks)

   Lime

   (e) Suggest three ways in which substance L is important in crop production. (03marks)
      - Improves soil texture making it suitable for gardening
      - Neutralizes acidic soil
      - Promoting better nitrogen fixation by legumes
      - Increasing the availability of nutrients to plants
      - Provides calcium and magnesium to the soil
      - Reduces toxicity of the soil caused by aluminium and manganese
      - Boost fertilizer efficiency
      -
5. Specimen P, Q, R and S are damaged plant parts
   (c) Examine the specimens and state the damage and its cause, for each specimen in table 1 (04marks)

Table 1

| Specimen | Damage | Cause of damage |
|---|---|---|
| P | Palisade layer eaten causing irregular brown spots on upper leaf surface. | Coffee miner pest worms |
| Q | Brown rust patches under the leaf | rust fungus, Hemileia vastatrix. |
| R | Beans perforated | Bean weevil |
| S | Chlorosis and leaves are distorted | Cassava virus |

(d) (i) give two effects of each damage on each of specimen P and S on the crops (02marks)

P - defoliation; death of the plant

Q - reduced photosynthesis, defoliation, reduced yield

R - rotting of beans, reduced quality, reduced rate of germination

S -stunted growth; reduced yield, cassava rot

End