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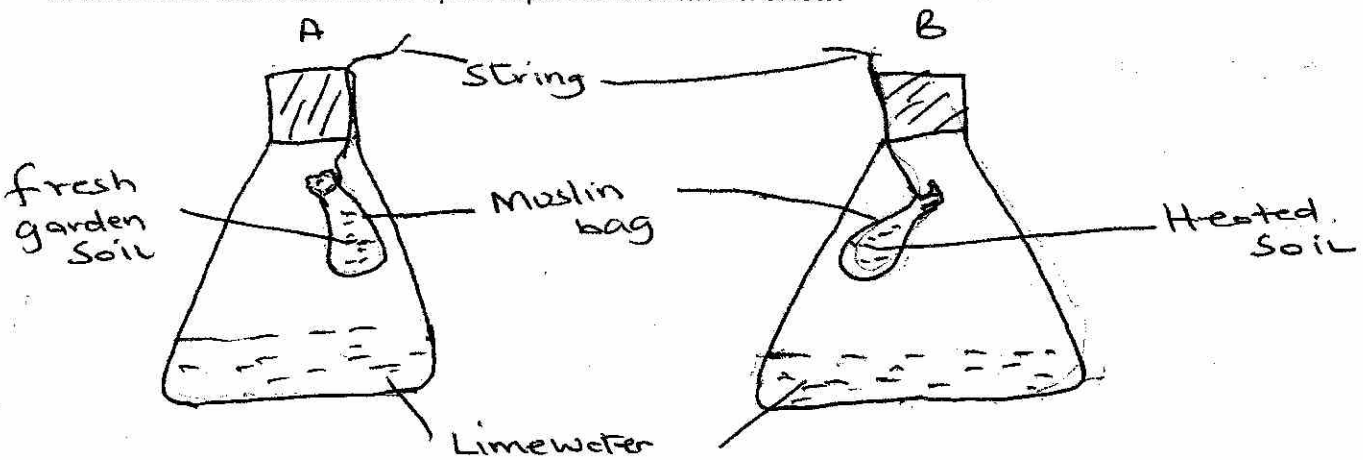
GATITU SECONDARY SCHOOL P.O. BOX 327, GATUNDU.
END OF TERM II EXAM FORM I AGRICULTURE 2014. TIME: 2HRS.

NAME.....ADM.....CLASS.....

1. Some form one students set up on experiment as shown below.



a) State the aim of experiment. (2mks)

To show that soil contains living organisms

2

b) State observations made in the two conical flasks. (4mks)

A. Lime water forms a white ppt.

B. Limewater remains clear/do not change

4

C) Explain the above observations. (8mks)

A. Fresh garden soil contains living organisms; which respire to release CO_2, which reacts with lime water; making lime water to form a white ppt.

B. Heating soil kills soil living organisms; hence no respiration; hence no production of CO_2, hence no reaction with lime water making it remain clear.

8

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D) Why was the muslin bag used in this experiment? (2mks) (2)

Contains pores which allow exchange of gases

2. Two garden soil samples A and B each weighing 100gms were obtained. 50gms of water was added to sample A which was then weighed. The mass was 148gms. Sample B (100gms) was heated in an oven at 100°c to a constant mass of 95gms. It was further strongly heated to 400°c to a constant mass of 92gms.

A) i) What was responsible for the loss of mass when 50gms of water was added to 100gms of soil? (2mks) (2)

Air

ii) Calculate percentage loss in a (i) above. (3mks) (3)

Air = 150 − 148 = 2gms ✓

$\frac{2}{100} \times 100$ ✓ = 2% ✓

iii) What was lost when soil sample B was heated to 100°c (2mks) (2)

water

iv) Calculate the percentage loss in a (iii) above. (3mks) (3)

100 − 95 = 5gm.

% Air = $\frac{5}{100} \times 100$ = 5%

v) On continuous heating of sample B to 400°c, what was lost? (2mks) (2)

Humus / organic matter

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vi) Calculate the percentage loss in a (v) above. (3mks)

3

Organic matter = 95 - 92 = 3 gms

% OM = $\frac{3}{95} \times 100$ = 3.16% ≈ 3¼%

b) Name three uses of the substance that was lost in sample B when it was heated to 400. (3mks)

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i) - Release plant nutrient

ii) Provides dark colour to the soil moderate soil temperature
- Improves soil structure

iii) - Provides good habitat for soil micro organism
- Improve water infiltration

3. Outline teh characteristics of clay soils. (20mks)

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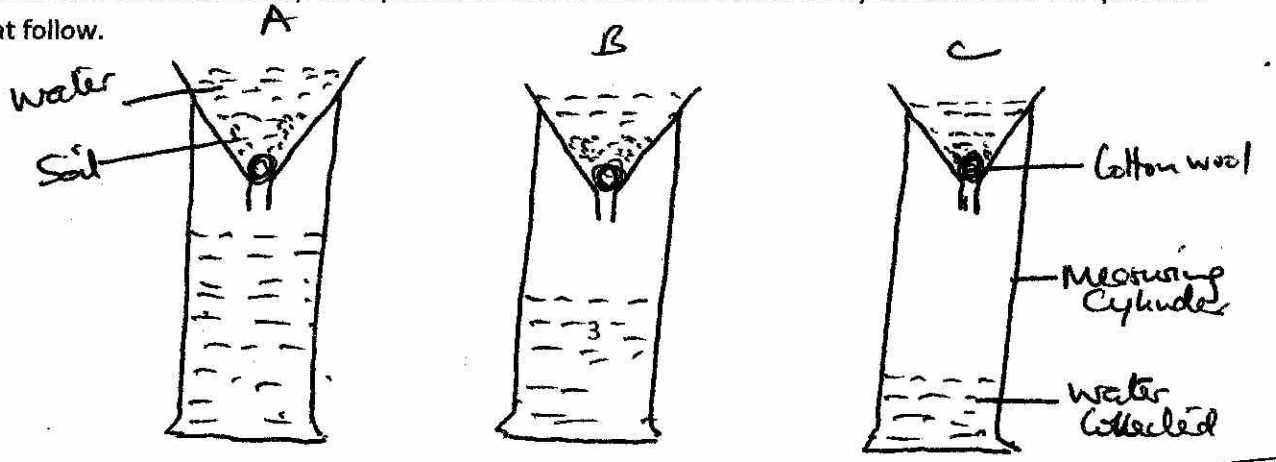
- High water holding capacity
- Small particles
- Cracks when dry
- Hard when dry
- Sticky when wet / difficult to work on.
- Poorly drained / easily waterlogged.
- Poorly aerated
- High capillarity.
- High ions exchange capacity / High fertility.
- Swells when wet
- Has high pH / alkaline.

4. A form one student set up an experiment on soils as shown below. Study it and answer the questions that follow.



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Equal amounts of different soils A, B and C were put in each funnel. Equal amount of water was put in each funnel. The amount of collected water is shown in each cylinder.

a) State two aims of the above experiment. (4mks)

i) Compare porosity of different soils

ii) Compare water holding capacity of different soil

4

b) Identify the soils put in A, B and C. (6mks)

6

A Sandy

B loam

C clay.

c) What was the use of cotton wool in the above experiment? (2mks)

Prevent soil getting into the measuring cylinder

2

d) Give an explanation for the observation made in set up C. (4mks)

4

- clay soil has small soil particles, ~~has~~ hence few air spaces, hence holds most water; hence has the ~~lowest~~ highest porosity hence retains most water

5. State two methods used to separate soil particles. (4mks)

4

i) Sedimentation method/measuring cylinder method

ii) Use of sieves/mechanical method

6. Name three physical characteristics of a soil. (6mks)

6

i) Colour

ii) Texture

iii) Structure

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7. State two methods of improving sandy soils. (4mks)

i) Adding organic manure

ii) Application of lime

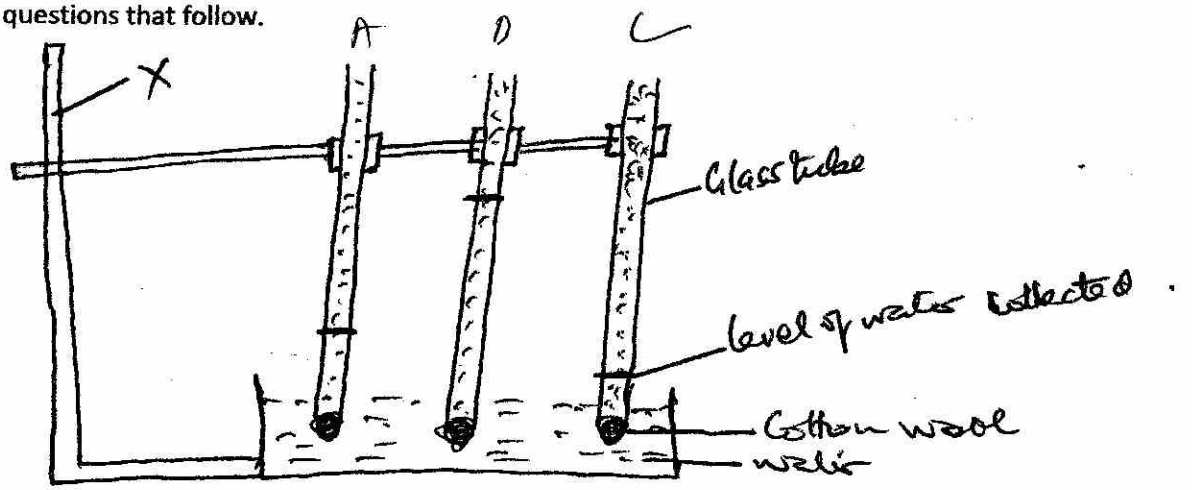
4

8. Why are loam soils best suited for farming? Give four reasons. (8mks)

- moderate/good waterholding capacity
- Good amounts of nutrient/ organic matter
- well aerated
- Not easily eroded/well drained

8

9. A form one student set up an experiment on soils as shown below. Study the diagram and the questions that follow.



a) State the aim of the experiment. (2mks)

Compare capillarity of different soils

2

b) Identify the soils labeled A, B and C. (6mks)

6

A loam

B clay

C clay sand

c) Identify part labelled X (2mks)

2

clamp.

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