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

034/2   **AGRICULTURE 2**

Time : 2:15 Hours   **ANSWERS**   **Year : 2020**

Instructions

1. This paper consists two questions.

2. Answer **all** questions.

3. Communication devices and any unauthorised materials are **not** allowed in the examination room.

4. Write your **Examination Number** on every page of your answer booklet(s).

1. (a) You are provided with sample of soil A, B and C. Carry out the following procedures and then answer the questions that follow:

Procedure

(i) Weigh separately approximately 50 g of each soil type labeled A, B and C.

(ii) Put/plug an equal amount of cotton wool into the neck of each of the filter funnels labeled A, B and C.

(iii) Put filter paper into each of the filter funnels labeled.

(iv) Take three measuring cylinders labeled A, B and C.

(v) Put soil samples of the 50 g you have measured into the filter funnels as follows: soil sample A into filter funnel A, soil sample B into filter funnel B and soil sample C into filter funnel C.

(vi) Place/mount the filter funnels with soil samples A, B and C onto measuring cylinders A, B and C respectively.

(vii) By using 250 cm³ beaker, pour 100 cm³ of water into the filter funnels simultaneously.

(viii) Wait for 15 minutes. Read and record the amount of water which has passed through in each soil sample in every measuring cylinder.

Questions

(i) Which measuring cylinder collected more water than the other two? Give a reason.

The measuring cylinder with soil sample A collected more water than the others because soil A is sandy soil, which has large particles and large pore spaces that allow water to pass through quickly with minimal retention.

(ii) Which measuring cylinder collected less amount of water than the others? Give a reason.

The measuring cylinder with soil sample C collected the least amount of water because soil C is clay soil, which has very fine particles and small pore spaces that hold water tightly, reducing water infiltration.

(iii) What conclusion can you draw from the experiment you have done?

The conclusion is that different soil types have different water retention capacities due to variations in particle size and pore space. Sandy soils retain little water while clay soils retain more water.

(iv) Give the name of the soil sample which its measuring cylinder collected less amount of water?

The soil sample that collected the least amount of water is clay soil.

(v) Propose one best way that can be used to improve the water retention ability of the soil sample from the funnel which its measuring cylinder collected more water.

The best way to improve water retention ability in sandy soil is by adding organic matter such as compost or manure, which increases its ability to hold water and nutrients.

(vi) What are the six characteristics of the soil sample from the measuring cylinder which collects less amount of water in relation to its workability in the field?

Clay soil is heavy and sticky when wet, which makes it difficult to work with. It has poor drainage, causing waterlogging during rainy seasons. It hardens when dry, making it difficult to till. It is easily compacted, reducing aeration for plant roots. It has good fertility because it holds nutrients well. It requires more labor and energy for cultivation due to its heaviness.

(b) You are provided with specimens W, X, Y and Z. With the aid of a hand lens, observe the given specimens carefully and then count the number of teeth per centimeter in each specimen and then answer the questions that follow.

Questions

(i) Fill in the following table by giving the number of teeth per centimeter and type of a file for each of the specimen X, W, Y and Z.

Specimen W has a small number of teeth per centimeter, making it a rough file.

Specimen X has a medium number of teeth per centimeter, making it a second-cut file.

Specimen Y has many teeth per centimeter, making it a smooth file.

Specimen Z has very fine teeth per centimeter, making it a dead-smooth file.

(ii) In reference to the number of teeth obtained in each specimen, give the ideal function of each type of file identified in part (i).

The rough file (W) is ideal for removing large amounts of material quickly from a surface.

The second-cut file (X) is suitable for general purpose filing where moderate smoothness is required.

The smooth file (Y) is used for finishing work and producing a finer surface.

The dead-smooth file (Z) is ideal for precision finishing where a very smooth surface is needed.

(iii) How would you care and maintain the given specimens after use in a given work piece? Give two points.

After use, the files should be cleaned with a file card or brush to remove filings stuck between the teeth. They should also be stored in a dry place, preferably wrapped or placed separately to prevent damage and rusting.

Find this and other free resources at: https://maktaba.tetea.org

Prepared by Maria Marco for TETEA

2. You are provided with specimens J₁, J₂ and J₃. Use hand lens to observe the given specimens in their faces and then answer the questions that follow:

Questions

(a) From your observations, name the harmful organ(s) of each specimen.

Specimen J_1 has piercing and sucking mouthparts.

Specimen J_2 has biting and chewing mouthparts.

Specimen J_3 has sponging mouthparts.

(b) Draw and label simple diagram of each specimen to show destructive organ(s) named in (a) above.

The drawings should show mouthparts of piercing and sucking insects like aphids, biting and chewing insects like grasshoppers, and sponging insects like houseflies, with clear labels of proboscis, mandibles and labellum.

(c) What are the function(s) of the organ(s) in each specimen named in (a)?

The piercing and sucking organ in specimen J_1 functions to pierce plant tissues and suck sap.

The biting and chewing organ in specimen J_2 functions to cut and chew plant leaves and stems.

The sponging organ in specimen J_3 functions to sponge up liquid substances from plant or animal surfaces.

(d) Suggest three observable symptoms which are likely to be shown by the animals attacked by each of the specimen.

Animals attacked by piercing and sucking insects show weakness due to blood or sap loss, wounds at the site of attack, and reduced productivity.

Animals attacked by biting and chewing insects show physical wounds, hair loss in the infested areas, and irritation or continuous scratching.

Animals attacked by sponging insects show open wounds that may attract more flies, stress due to continuous disturbance, and secondary infections caused by pathogens introduced by the flies.

(e) Mention three harmful effects of each specimen to the host animal.

Piercing and sucking insects cause anemia, reduced body condition, and transmission of blood-borne diseases.

Biting and chewing insects cause damage to skin and hides, reduction in meat and milk quality, and predispose animals to infections.

Sponging insects cause contamination of animal products, transmission of pathogens, and reduction in animal growth and productivity.

Prepared by Maria Marco for TETEA

(f) What are the two commonly farm animals affected by each specimen?

Specimen J_1 commonly affects cattle and goats.

Specimen J_2 commonly affects sheep and poultry.

Specimen J_3 commonly affects cattle and horses.

Prepared by Maria Marco for TETEA