

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

034/2

AGRICULTURE 2

(ACTUAL PRACTICAL)

(For Both School and Private Candidates)

Duration: 2:30 Hours

SOLUTIONS

Year: 2025

Instructions

1. This paper consists of **two (2)** questions.
2. Answer **all** questions.
3. Each question carries **twenty five (25)** marks.
4. All writing must be in **blue** or **black** ink, **except** drawings which must be in pencil.
5. Communication devices and any unauthorised materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s)

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1. (a) You are provided with the specimen P. Perform the following procedures and answer the questions that follow.

Questions

(i) What is the aim of this experiment?

The aim of this experiment is to test for the presence of starch in specimen P. Iodine solution is used as a chemical reagent to detect starch after boiling removes possible interference from enzymes or microorganisms.

(ii) What have you observed in the experiment?

After adding iodine solution to the cooled specimen P, a blue black coloration is observed.

(iii) Give comment on the results obtained in part (ii).

The blue black coloration indicates the presence of starch in specimen P. This confirms that specimen P contains carbohydrates in the form of starch.

(b) You are provided with specimen Z and polished vertical slanted surface of a wooden block. Design and carry out a simple experiment to test for the presence of adulterant in the specimen and write a report on the experiment.

Aim

The aim of the experiment is to test for the presence of adulterants in specimen Z.

Apparatus and materials

Specimen Z, polished vertical slanted wooden surface.

Procedure

A small amount of specimen Z is placed at the top of the polished slanted wooden surface. The specimen is allowed to slide slowly down the surface under gravity. The movement of the specimen is carefully observed.

Observation

Some particles slide smoothly down the surface while others stick to the wooden surface or move irregularly.

Conclusion

The irregular movement and sticking of some particles indicate the presence of adulterants in specimen Z. Pure substances slide smoothly without leaving residues.

(c) (i) From the experiments in part (a) and (b) which specimen would you recommend for consumption? Give a reason.

I would recommend specimen P for consumption because it contains starch and shows no indication of adulteration, making it nutritious and safe for human consumption.

(ii) Give six advantages of consuming the specimen you have recommended in part (c) (i).

Consuming specimen P provides the body with energy because starch is an important source of carbohydrates needed for daily activities.

It supports proper growth and development, especially in children, due to its high energy content.

Specimen P helps maintain body temperature by supplying energy required for metabolic processes.

It contributes to satiety, reducing hunger and helping people feel full for longer periods.

Starch rich foods are easily digestible, making specimen P suitable for people of all ages.

Consumption of specimen P supports brain function since glucose derived from starch is the main fuel for the brain.

(d) Briefly explain four effects of consuming the specimen that you have not recommended in part (c) (i).

Consuming specimen Z may cause health problems because adulterants can contain harmful substances that are unsafe for the human body.

Adulterated food can lead to digestive disorders such as stomach pain, diarrhea, or vomiting.

Long term consumption of adulterated food may cause chronic illnesses due to accumulation of toxic substances.

Adulterants reduce the nutritional value of food, leading to poor health and nutrient deficiencies.

2. You are provided with 150 g of specimen J, 150 g of specimen K, 150 g of specimen L, 3 filter papers, 3 measuring cylinders (250 cm³), 3 filter funnels, 1 beaker (250 cm³), source of water and wall clock. Perform the following procedures and answer the questions that follow.

(a) Giving two reasons comment on the suitability of each of the specimens J K and L for the crop production.

Specimen J is suitable for crop production because it allows moderate water drainage, preventing waterlogging while retaining enough moisture for crops. It also shows balanced filtration, indicating good aeration.

Specimen K is moderately suitable because it drains water faster, reducing water retention. This may require frequent irrigation but allows good root aeration.

Specimen L is less suitable for crop production because it retains too much water, leading to poor drainage. Excess water may cause root rot and poor aeration.

(b) Based on your observation in the experiment suggest the possible textural class for each of the specimens J K and L.

Specimen J is likely loamy soil due to moderate drainage and retention.

Specimen K is likely sandy soil because of fast drainage.

Specimen L is likely clay soil due to slow drainage.

(c) Apart from soil characteristics observed during the experiment what other good characteristics of specimen J K and L are suitable for crop production? Give two points for each.

Specimen J has good nutrient holding capacity, which supports sustained crop growth. It also supports microbial activity that improves soil fertility.

Specimen K is easy to cultivate due to its loose structure. It warms up quickly, which favors early crop establishment.

Specimen L has high nutrient content because clay particles hold nutrients strongly. It also supports crops that require high water retention.

(d) How would you improve one of the specimen you have pointed in part (a) to be less suitable for crop production? Give eight points.

I would improve specimen L to make it suitable for crop production.

Adding organic matter such as compost improves soil structure.

Practicing deep ploughing breaks compact soil layers.

Mixing sand into the soil improves drainage.

Constructing drainage channels removes excess water.

Practicing crop rotation improves soil condition.

Avoiding over irrigation prevents waterlogging.

Applying lime improves soil structure and reduces stickiness.

Using raised beds improves aeration and root development.

(e) Give a reason for slowest drainage observed in one of the specimens during the experiments.

The slowest drainage is due to high clay content, which has very small pore spaces that restrict water movement and reduce permeability.