THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATION COUNCIL OF TANZANIA

ADVANCED CRTIFICATE OF SECONDARY EDUCATION EXAMINATION

134/3 **AGRICULTURE 3**

(For Both School and Private Candidates)

Time: 3 Hours. **ANSWER** **Year: 2022**

Instructions

1. This paper consists of **three (3)** questions.
2. Answer **two (2)** questions.
3. Cellular phones and unauthorized materials are **not allowed** in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

1. You are provided with the following specimens: C_1, C_2, and C_3. Carefully observe them and answer the questions that follow.
   (a) State three observable abnormalities for specimen C_1 and one abnormality for specimen C_2.
   Specimen C_1 shows wilting of leaves even under moist conditions.
   Specimen C_1 shows brown discoloration in the vascular tissues when the stem is split.
   Specimen C_1 shows milky bacterial streaming when the stem base is cut and soaked in water.
   Specimen C_2 shows rotting of fruits with sunken spots covered by whitish mold.

   (b) Identify the carriers of the pathological agents responsible for the observed abnormalities in specimen C_1 and C_2.
   The carriers of the disease in specimen C_1 are contaminated soil, infected planting materials, irrigation water, and farm tools.
   The carriers of the disease in specimen C_2 are insects, wind, rain splashes, and infected fruits that spread fungal spores.

   (c) Give six ways in which abnormalities identified in specimen C_1 can be controlled.
   Use certified disease-free planting materials.
   Practice crop rotation with non-susceptible crops.
   Uproot and destroy infected plants immediately.
   Sterilize farm tools before use in new fields.
   Improve drainage to avoid waterlogging.
   Apply recommended bactericides or resistant crop varieties.

   (d) State two ways of combating the situation observed in specimen C_2.
   Spray fungicides at recommended intervals.
   Collect and destroy all infected fruits to reduce inoculum sources.

   (e) Give five general symptoms of abnormalities caused by the identified pathological agents in specimen C_1 and C_2.
   Wilting of leaves and stems.
   Stunted plant growth.
   Yellowing or chlorosis of leaves.
   Decay and rotting of fruits or roots.
   Death of the whole plant if untreated.

   (f) Account for four effects of the abnormalities identified in specimen C_1 and C_2 if the farmer does not take the preventive measures.
   There will be a reduction in crop yield leading to economic losses.
   Poor quality of produce makes it unmarketable.
   Increased cost of production due to repeated planting and management.
   Possible spread of the disease to other fields reducing overall farm productivity.

2. You are provided with the following specimens, equipment, apparatuses and materials: M, soil, Pyrex beaker (100 cm^3), weighing balance, wall clock, stirring rod, source of heat, wire gauze and tripod stand.
   Perform the procedures hereafter and then answer questions that follow:
   (i) Weigh a beaker.

(ii) Weigh 50 g of specimen M and put it in a beaker.
(iii) Place a beaker containing specimen M on top of wire gauze on a source of heat.
(iv) Heat specimen M for 15 minutes while stirring and carefully make observations on what is happening during the heating.
(v) Remove the beaker from the source of heat and let it cool for 15 minutes.
(vi) Re-weigh the beaker containing specimen M after cooling.

Questions
(a) Record the data in the table provided:
Weight of beaker (g) = 50 g
Weight of beaker + specimen M before heating (g) = 100 g
Weight of beaker + specimen M after heating (g) = 90 g

(b) State the aim of the experiment.
The aim of the experiment is to determine the moisture content of specimen M.

(c) Calculate the percentage loss in the weight of sample M.
Initial weight of sample M = 50 g
Final weight of sample M = 40 g
Loss in weight = 50 g − 40 g = 10 g
Percentage loss = (10 ÷ 50) × 100 = 20%

(d) Give reason for the colour change in the specimen after heating.
The colour change occurs due to loss of water and burning of organic matter present in the soil sample.

(e) Give six effects of burning specimen M during the land preparation.
Burning destroys soil organic matter.
It kills useful soil microorganisms.
It releases nutrients like potassium in ash but makes others like nitrogen volatile and lost.
It causes soil erosion due to loss of vegetation cover.
It may lead to soil hardening and reduced water infiltration.
It contributes to air pollution through smoke emission.

3. You are provided with the following specimen, apparatuses and materials: specimen X, knife/surgical blade, forceps, petri-dish and one pair of disposable hand gloves. Perform the procedures hereafter and answer questions that follow:
   (i) Wear hand gloves.
   (ii) Take specimen X from the watch glass and put it over the petri dish.
   (iii) Use knife/surgical blade to cut specimen X at the middle longitudinally.
   (iv) Empty the content of specimen X on the watch glass and carefully observe the content.
   (v) Remove the outer layer of the inner part of specimen X and make an observation to the remaining layer.

Questions
(a) Name the observed content emptied on the watch glass.
The observed content is food particles stored in the crop.

(b) Give the role of the observed materials in part (a).
They serve as temporary food storage before digestion.

(c) Briefly explain two features of the inner part of specimen X from the observation made.
The wall of the gizzard is thick and muscular for grinding food.
The inner surface is rough and lined with a tough cuticle that helps in mechanical breakdown of food.

(d) Give reason why teeth are not necessary in the organism from which the specimen X was taken.
The gizzard performs the grinding role of teeth, hence teeth are not needed.

(e) Explain how the food particle reach specimen X from the beak.
Food is picked by the beak, swallowed into the mouth, passes through the oesophagus and crop, then moves into the gizzard (specimen X).

(f) Enumerate six features which differentiate the digestive system of poultry from that of other farm animals.
Presence of beak instead of teeth.
Crop for temporary food storage.
Proventriculus for enzymatic digestion before the gizzard.
Gizzard for mechanical digestion.
Shorter large intestine compared to mammals.
Presence of paired caeca at the junction of small and large intestines.

(g) Draw the system to which specimen X is a part and label ten parts.