

**THE UNITED REPUBLIC OF TANZANIA  
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA  
ADVANCED CERTIFICATE OF SECONDARY EDUCATION  
EXAMINATIONS**

134/3

**AGRICULTURE 3  
(PRACTICAL)**  
(For Both School and Private Candidates)

**Time 3:20 Hours**

**Year: 2020**

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**Instructions**

1. This paper consists of **three (3)** questions.
2. Answer **all** questions.
3. Question **one** carries 20 marks and the other **two** carry **15** marks each.
4. Cellular phones and any unauthorized materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

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1. You are provided with specimens  $S_1$  for experiment **I** and  $S_2$  for experiment **II**, two 250 cm<sup>3</sup> measuring cylinders, two 100 cm<sup>3</sup> beakers and a wall clock. Perform the following procedures and answer the questions that follow:

### Procedures

#### Experiment I

- (i) Put 100 cm<sup>3</sup> of water in a 250 cm<sup>3</sup> measuring cylinder.
- (ii) Using a 100 cm<sup>3</sup> beaker, put specimen  $S_1$  up to the 100 cm<sup>3</sup> mark.
- (iii) Empty specimen  $S_1$  into the measuring cylinder at step (i) and shake well.
- (iv) Let the mixture stand for ten minutes while observing what happens in the mixture and record the final reading of the mixture in the measuring cylinder.

#### Experiment II

Repeat the same procedures of **Experiment I** for specimen  $S_2$  using another set of apparatuses.

### Questions

- (a) What have you observed after shaking well the mixture in experiments **I** and **II**? **(1 mark)**
  - (b) What is the inference of your observation in experiments **I** and **II**? **(2 marks)**
  - (c) Giving a reason, comment on the volumes of the mixture in experiments **I** and **II** after shaking well the mixture and letting it to stand for 10 minutes. **(2 marks)**
  - (d) Calculate the percentage of air composition in each of specimen  $S_1$  and  $S_2$ . **(10 marks)**
  - (e) Based on the percentage of air composition calculated in part (d), suggest the type of soil in each of specimens  $S_1$  and  $S_2$ . In each case give a reason for your suggestion. **(3 marks)**
  - (f) Referring to the percentage of air composition in each of specimens  $S_1$  and  $S_2$ , briefly describe air-water relationship in the two specimens. **(2 marks)**
2. You are provided with specimens  $E_1$  and  $E_2$  in the 250 cm<sup>3</sup> pyrex beakers, two bunsen burners, two tripod stands, a match box, two wire gauzes and two thermometers. Perform the following procedures and then answer the questions that follow:

### Procedures

- Put each of the wire gauze on top of the tripod stand.
- Place tripod stands over the bunsen burners.
- Place each of the beakers containing specimen  $E_1$  and  $E_2$  on wire gauze on the tripod stands.
- Immerse thermometers in each of the beakers containing specimens  $E_1$  and  $E_2$ .
- Light the bunsen burners and heat specimens  $E_1$  and  $E_2$ . Take records of the temperature for each of the specimens after 2 minutes of heating.
- Switch off the bunsen burners and remove beakers from the source of heat to let specimens  $E_1$  and  $E_2$  cool. Take records of temperature for each of the specimens after 5 minutes of cooling.

### Questions

- (a) Record the results of the experiment as shown in the following table:

Specimens	Temperature of the specimens after 2 minutes of heating (°C)	Temperature of the specimens after 5 minutes of cooling (°C)
$E_1$		
$E_2$		

**(2 marks)**

- (b) From the results of the experiment, suggest which specimen can be best used than the other as a coolant in a tractor engine. Give two reasons for your suggestion. **(3 marks)**
- (c) Briefly describe the mechanism of cooling the tractor engine using the specimen that you have suggested. **(4 marks)**
- (d) Account for two limitations of a tractor engine cooling system that uses the specimen you have suggested. **(2 marks)**
- (e) Briefly explain four reasons for engine overheat in a cooling system using the selected specimen. **(4 marks)**
3. You are provided with specimens  $L_1$ ,  $L_2$ , a measuring cylinder and a beaker. Perform the following procedures and then answer the questions that follow:

#### **Procedures**

- Measure 25 cm<sup>3</sup> of specimen  $L_1$  and pour it into a beaker.
- Squirt few streams of  $L_1$  into specimen  $L_2$  and observe carefully.

#### **Questions**

- (a) What is the aim of the experiment? **(1 mark)**
- (b) Briefly explain your observations in the experiment. Give three reasons to support your observations. **(3 marks)**
- (c) What conclusions can you make from the experiment? **(1 mark)**
- (d) Account for five predisposing factors for what has been diagnosed in the experiment. **(5 marks)**
- (e) As a livestock scientist provide an advice to the livestock keepers on five measures to be taken in order to obtain clean and normal specimen  $L_1$ . **(5 marks)**