EXAMINATIONS COUNCIL OF ZAMBIA

Examination for School Certificate Ordinary Level

Biology

Paper 3 Practical Test

Additional Information:
As listed in Instructions to Supervisors

Time 1 hour 15 minutes

Instructions to Candidates

Write your name, centre number and candidate number in the spaces provided at the top of this page.
There are two questions in this paper.
Answer both questions.
Write your answers in the spaces provided on the question paper.
Use sharp HB pencils for your drawings. Coloured pencils and crayons should not be used.

Information for candidates
The number of marks is given in brackets [ ] at the end of each question or part question.

Cell phones are not allowed in the examination room.

FOR EXAMINER'S USE

1

2

Total

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This question paper consists of 5 printed pages
Answer both questions

1. **E16** is an arrangement representing an ecosystem consisting of biotic and abiotic factors.

   (a) Name any **two** biotic components in **E16** and state their roles.

   (i) 1. Name: ................................................. [1]
        2. Role: .................................................. [1]

   (ii) 1. Name: ............................................... [1]
        2. Role: .................................................. [1]

   (iii) State any **two** abiotic components you can see in **E16**.

    1. .............................................................. [1]
    2. .............................................................. [1]

(b) (i) Describe the importance of having a variety of living things in **E16**.

    ........................................................................ [1]

(ii) What would happen if the biotic components were removed from **E16**?

    ........................................................................ [2]

(c) (i) Using organisms in **E16**, construct a food chain to illustrate feeding relationships that exist within an ecosystem.
(ii) Classify each organism in the food chain in (c) (i) above according to their trophic levels.

.................................................................................................................................................. [3]

(iii) Name any two physical factors in E16 which are not directly observable but influence the activities of the setup in E16.

.................................................................................................................................................. [2]

(iv) State any three economic reasons for maintaining biodiversity in the ecosystem.

1. ............................................................................................................................................ [3]

2. ............................................................................................................................................

3. ............................................................................................................................................

Total 20 marks
2 You are provided with specimens **W70** and **W71**. Specimen **W70** is homozygous tall and **W71** is homozygous short. Tallness is controlled by a dominant gene (T) while shortness is controlled by a recessive gene (t).

(a) A monohybrid cross was carried out between **W70** and **W71**.

(i) State the phenotype of

1. **W70** ........................................................................................................... [1]
2. **W71** ........................................................................................................... [1]

(ii) Determine the genotype of the F₁ generation.


(iii) Determine the phenotype of the F₁ generation.


(b) The F₁ offspring were allowed to inbreed.

(i) Determine the phenotype of the F₂ generation.


(ii) Determine the genotype of the F₂ generation.


(iii) Determine the phenotypic ratio of the F₂ generation.


(c) You are provided with two dwarf plants labeled as specimens **C** and **D**. Dwarfness is controlled by a recessive gene, t.

(i) State the genotype of the parent plant **C**.


(ii) Determine the phenotype of the F₁ generation formed from a cross between **C** and **D**.


(iii) Illustrate using a genetic diagram how the $F_1$ offspring in (c)(ii) above are formed.

(iv) State one disadvantage of the type of breeding shown by C and D.

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Total 20 marks
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