

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
FORM SIX COMPETENCE EXAMINATIONS (FOSCE) - 2025



133/2

BIOLOGY 2

Time: 3 Hours

24TH February 2025, AM

Instructions

1. This paper consists of **six (6)** questions.
2. Answer **five (5)** questions.
3. Each question carries **twenty (20)** marks.
4. Except for diagrams that must be drawn in **pencil**, all writing should be in blue or black ink.
5. **Cellular phones** and any unauthorized materials are not allowed in the examination room.
6. Write your **Examination number** on every page of your answer booklet/sheet(s)

1. (a) (i) Draw the structure of a bacteriophage and label any five of its parts
(ii) Briefly explain the two (2) unique characteristics that define a bacteriophage.
- (b). Bacteria are creatures that grouped into kingdom monera. Some are beneficial while others are harmful to human being. You as form six with knowledge of classification explain ways in which bacteria are beneficial and harmful to human. (Six points).

2. (a). Briefly, explain the following observations;

- (i) In cold weather human urinate more dilute urine than in hot weather.
- (ii) Animals that live in the dry habitats tend to have much longer loop of Henle than animals that live where water is freely available.

(b). Anna is the form V student at Mlimani secondary school. She has got confusion about statement provided by her teacher which states that “The excess of end product of protein digestion is never stored in the body rather than it is converted into harmless product before its removal”. You as form VI student assist Anna on explaining how the excess of end product of protein digestion is converted into harmless product.

3. (a) “Meristem is said to be the growth regulatory machine of the plant body.” Justify this statement by summarizing the type of meristem, their location, roles and their effects in plant growth. Tabulate your answers as shown below;

Type of meristem	Location	Role	Effect in growth

(b). Farmers at Songambe village were in a problem of harvesting poor yield of crops and sometimes their seeds fail to germinate even after watering and provision of other necessary conditions for germination. You as a form six student explain how you could advise those farmers in choosing the best seeds so that they can get high yield.

(c). Briefly explain how annual growth rings in trees provide information about **environmental conditions** of an area where a tree was picked and **age** of tree.

4. (a). Outline factors that led to Mendel’s success and failure in his work of inheritance.
- (b). (i). In white Leghorn fowl, plumage colour is controlled by two sets of genes, including the following:
White (**W**) is dominant over other colours (**w**), Black (**B**) is dominant over brown colour (**b**). The heterozygous F₁ genotype **WwBb** is white. Account for this type of gene interaction and show the genotypic ratio of F₂ generation.
- (ii). What is the probability of getting leghorn fowl plumage with White colour in F₂ generation

5. (a) Briefly explain the following concepts:
- i. Sewell-Wright- effect.
 - ii. Adaptive radiation.
- (b) (ii). Creation of new species is the gradual process which mark the occurrence of evolution. This happens by various mechanisms which operate to bring about arising of new species. Explain any five (5) mechanisms that contribute to the creation new species.
6. (a). (i). Give out the assumptions of Lincoln Index in estimating population size of an area.
- (ii). In attempt to estimate the total number of penguins in a Usangu region, 200 penguins are captured, tagged and released. A month later 180 untagged and 45 tagged penguins were captured. Use the Lincoln Index method to estimate the total penguin population at Usangu region.
- (b). With examples, explain how economic development activities can alter the ecosystems. (Give six points)