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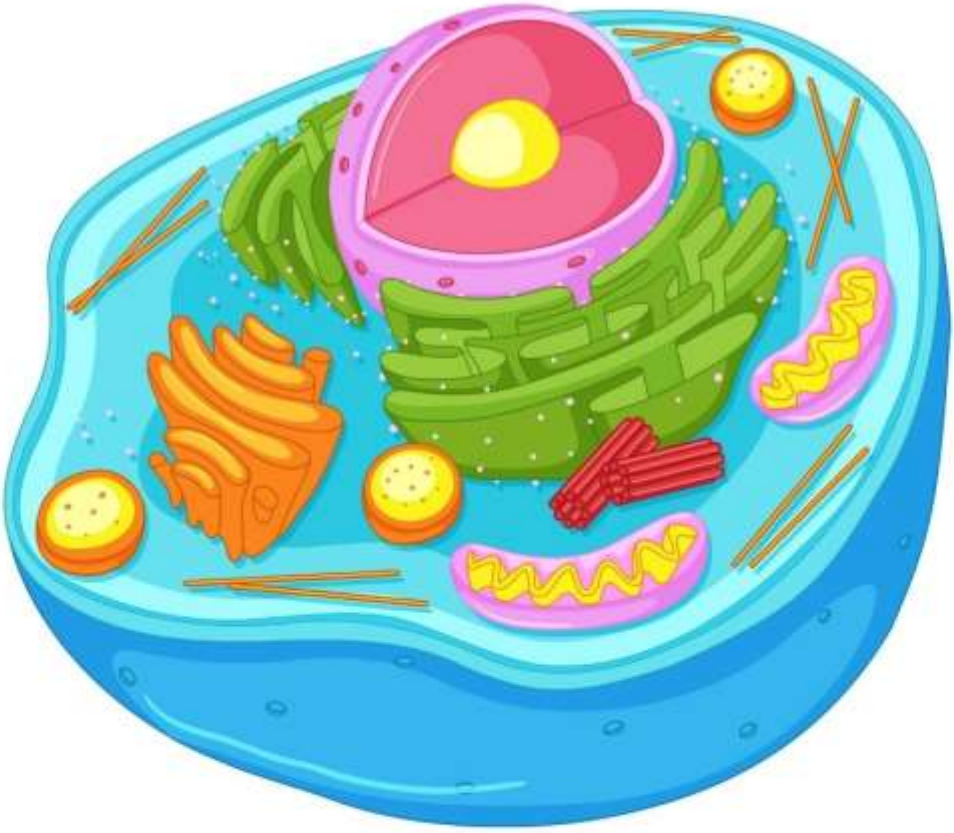
IBMYP Biology Sample Paper 2



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Group 3: Biology
On-Screen Examination

Total Marks: 100

Instructions

- The on-screen examination has not yet started.
- Your time will begin once you have clicked the Start button below. Do not click Start until instructed to do so.
- Before the examination begins you are given 5 minutes to become familiar with its structure. Please navigate around the examination, taking note of the length of each task and question. You have 2 hours to complete the examination.
- There are 10 separate questions in this examination. Each question may have sub-parts. Answer all the questions in the response boxes provided. The maximum mark for this examination is 100 marks.
- As you progress through the questions, your answers are automatically saved.
- When 2 hours has ended. you will no longer be able to answer any questions.

Question 1: 12 marks

1. Potatoes, a versatile and widely consumed crop, greatly benefit from the use of fertilizers in their growth. Fertilizers provide essential nutrients like nitrogen, phosphorus, and potassium that promote healthy plant development. These nutrients are crucial for potato plants' root development, foliage growth, tuber formation, and overall yield.

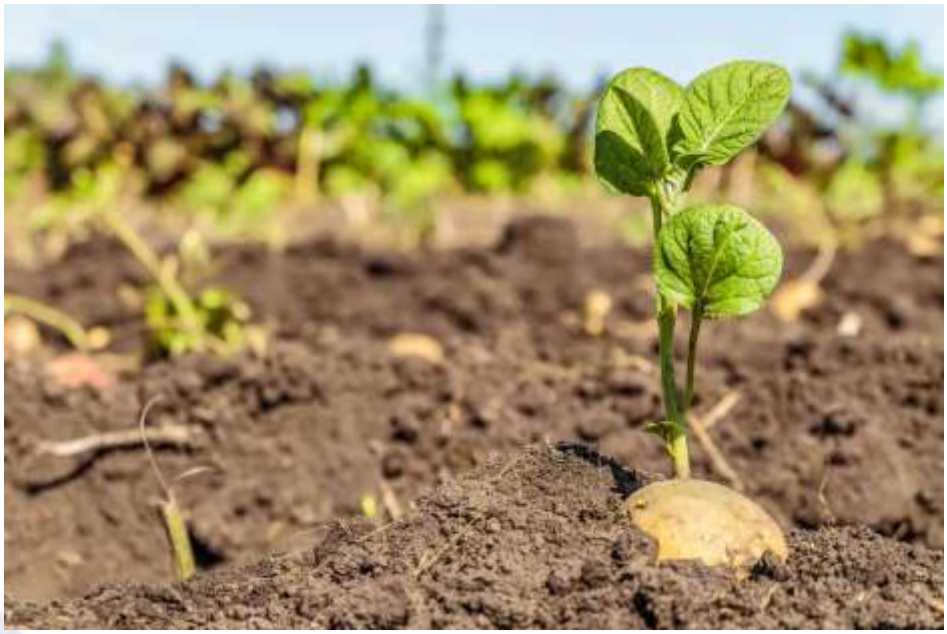

Image from https://www.bigassfertilizers.com/blogs/big-gardening-tips-home-garden-growing-plants-best-fertilizers/what-is-the-best-fertilizer-for-potatoes

A group of students conducted an experiment to investigate the effect of different fertilizer types on the growth of potato plants(Solanum tuberosum). They used three different fertilizers: organic compost, chemical fertilizer, and a control group without any fertilizer. The height of the potato plants was measured after four weeks of growth. The data collected by the students is presented in the table below:

Fertilizer Type	Mean Plant Height (cm)
Organic Compost	**45**
Chemical Fertilizer	**55**
Control Group	**35**

a) Define the term "experiment" and explain why it is an important scientific method.(2 marks)

Solution:

An experiment is a systematic and controlled approach used in scientific research to test a hypothesis or investigate the effect of certain variables. It involves manipulating independent variables and observing the resulting changes in dependent variables. Experiments are important because they provide empirical evidence, allow for cause-and-effect relationships to be established, and enable scientists to make reliable conclusions based on data.

b) State the independent variable, dependent variable, and control group in this experiment.(3 marks)

Solution:

- *Independent variable: The type of fertilizer (organic compost, chemical fertilizer, control group) is the independent variable. It is manipulated by the researchers to determine its effect on plant growth.*
- *Dependent variable: The height of the potato plants is the dependent variable. It is measured and observed to assess the outcome of the experiment and determine the effect of the different fertilizers.*
- *Control group: The control group in this experiment is the group of potato plants without any fertilizer. It serves as a baseline for comparison, allowing the researchers to evaluate the impact of the different fertilizers by comparing them to the control.*

c) Calculate the percentage increase in plant height for each fertilizer type compared to the control group.(2 marks)

Solution:

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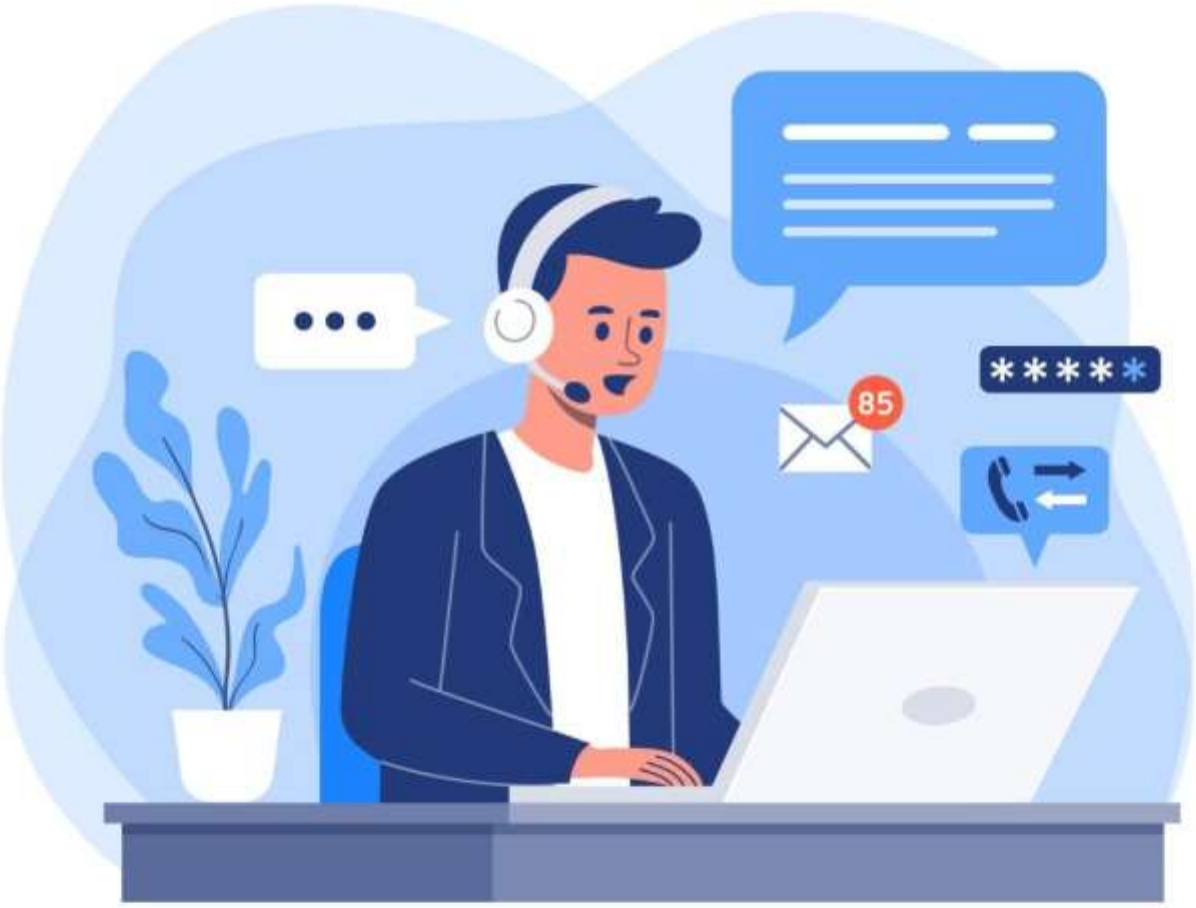

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