SEC35/c1.21m

L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL**
**2021 MAIN SESSION**

| | |
|---|---|
| SUBJECT: | **Agribusiness** |
| PAPER NUMBER: | Controlled – Unit 1 |
| DATE: | 21st May 2019 |
| TIME: | 10:00 a.m. to 11:35 a.m. |

# THIS PAPER SHOULD BE RETURNED TO THE INVIGILATOR AFTER THE EXAMINATION.

**Name of candidate** _____

**I.D. number** _____

**School** _____

**Class** _____

SEC35/c1.21m

Answer **ALL** questions in the space provided.

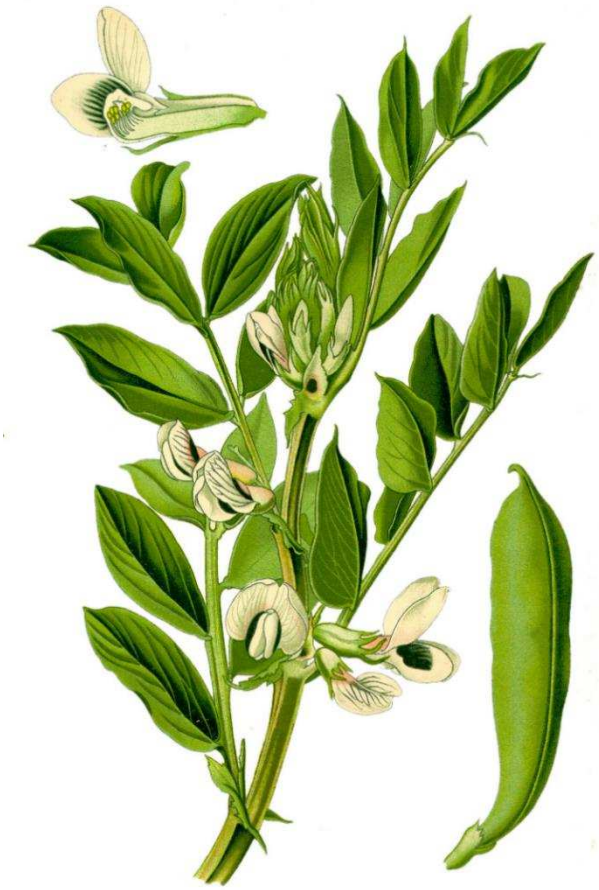
**Scenario:**

- Horticulture is the science, technology and business involved in the cultivation of fruit and vegetables which includes the production of several annual and permanent crops. It offers various exciting employment and business opportunities for young people and entrepreneurs.
- With the right set of knowledge and practical skills, it is possible to work in this important sector, contributing to the fruit and vegetable production, positively contributing to economic growth whilst also maintaining the natural environment.
- As a young expert, you have been employed by an agribusiness focusing on producing local fruits and vegetables for the local market. Your employer has asked you a few questions about the plant and soil science and the horticultural practices involved in the cultivation of these crops.

**Question 1** **K1 (4 marks)**

a. Label **ALL** the structures in the broad bean figure using the structures below.

| | | | |
|---|---|---|---|
| Leaves | Stem | Flower | Fruit |



(2)

Figure 1 – The broad bean (*Vicia faba)*

*(Image modified from: https://commons.wikimedia.org)*

b. Label **ALL** the structures in the tomato figure using the structures below.

| Leaves | Stem | Roots | Fruit |
|---|---|---|---|

(2)

Figure 2 – The tomato (*Lycopersicum esculentum*)

*(Image from: http://scientificillustration.tumblr.com)*

***Please turn the page.***

**Question 2** **K2 (4 marks)**

a. Describe **ONE** function of each of the plant cell components identified below:

| Plant cell component | Function |
|---|---|
| Cell membrane | |
| Nucleus | |
| Chloroplast | |
| Vacuole | |
| Cell wall | |
| Mitochondrion | |

(3)

b. Describe the transport of organic compounds in the phloem.

_____

_____

_____ (0.5)

c. Describe the transport of water and minerals in the xylem.

_____

_____

_____ (0.5)

**Question 3** **K3 (4 marks)**

By considering the life-cycle of a tomato plant, briefly outline the stages below.

| **Life cycle stage** | **Outline of the life cycle stage** |
|---|---|
| Germination | |
| | |
| | (1) |
| | |
| Seedling & Growth | |
| | |
| | (1) |
| | |
| Flowering & Pollination | |
| | |
| | (1) |
| | |
| Fruit development | |
| | |
| | (1) |
| | |

***Please turn the page.***

**Question 4** **C1 (6 marks)**

Figure 3 below shows the structure of (a) wheat (*Triticum vulgare)* and (b) common bean (*Phaseolus vulgaris).* Wheat and common bean are examples of a monocot plant and a dicot plant respectively.

Fill in the following table to explain the morphological differences of monocots and dicots. In the explanation **ONE** feature for each structure should be described.

a. b.

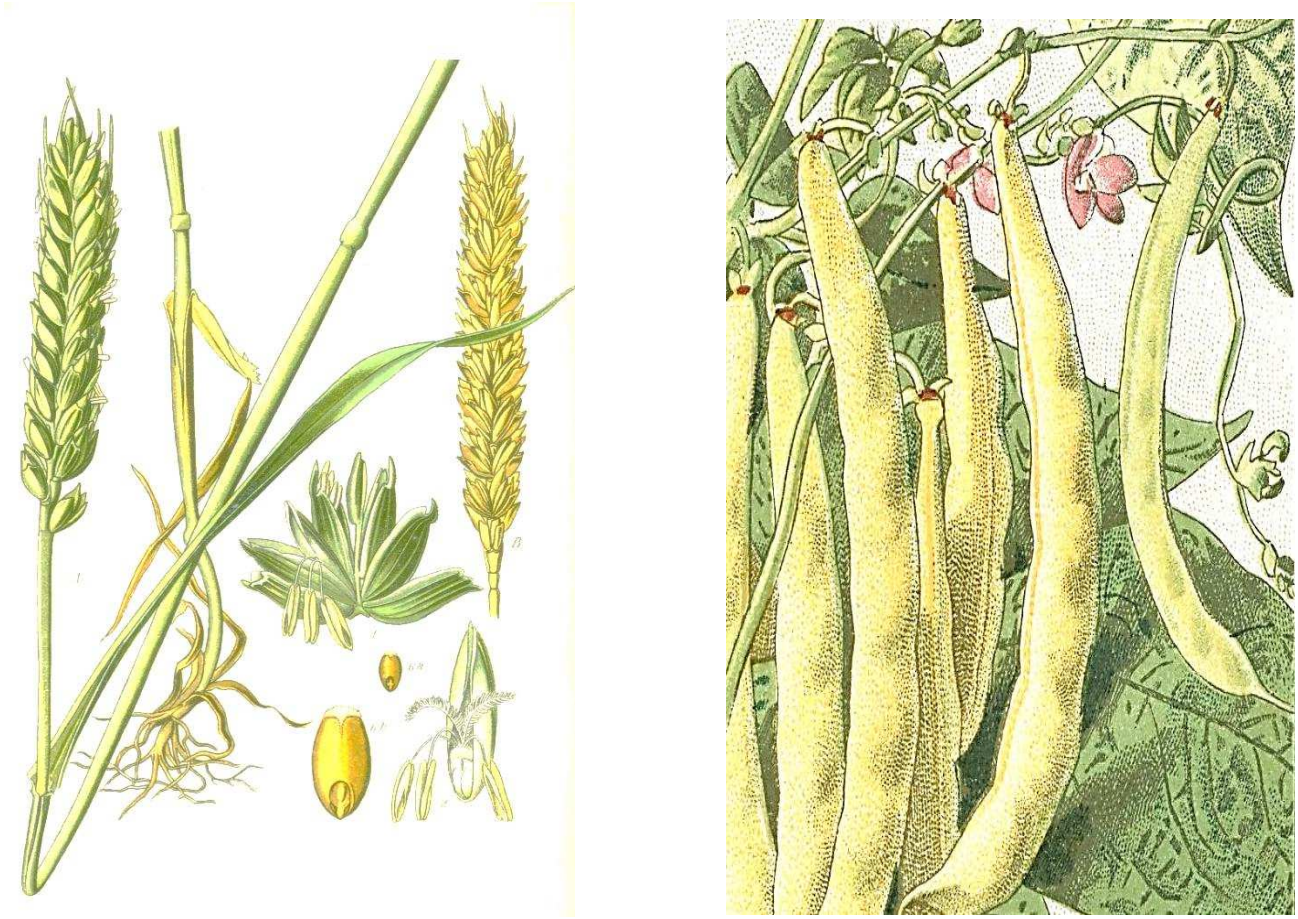


Figure 3

a. Wheat is a monocot plant. b. Common bean is a dicot plant.

*(Images modified from: http://www.plantsystematics.org; https://upload.wikimedia.org)*

| | **Structure** | a.<br>**Monocot**<br>**e.g. Wheat** | b.<br>**Dicot**<br>**e.g. Common Bean** |
|---|---|---|---|
| i. | Leaves | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |
| ii. | Roots | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |
| iii. | Stem | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |
| iv. | Flower | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |
| v. | Fruit | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |
| vi. | Seed | | |
| | | | |
| | | | |
| | | (0.5) | (0.5) |

***Please turn the page.***

**Question 5** **K5 (4 marks)**

Fruits and vegetables are key parts of your daily diet. Eating plenty of fruits and vegetables, as part of the healthful eating patterns, is considered as being important for a healthy lifestyle.

a. Outline **TWO** nutritional features of apples.

_____

_____ (2)

b. Outline **TWO** nutritional features of kale.

_____

_____ (2)

**Question 6** **C3 (6 marks)**

Discuss the following advantages and disadvantages of using manure in vegetable production.

Advantages of:

a. increased nutrients in the soil

_____

_____

_____

_____

_____ (2)

b. better water retention of the soil

_____

_____

_____

_____

_____ (2)

Disadvantage of:

c. increased pathogens in the soil

_____

_____

_____

_____

_____ (2)

**Question 7** **K8 (4 marks)**

Soil testing is important to identify the characteristics of soil, to optimise crop production and protect the environment from contamination by runoff containing excess fertiliser. Define the following soil parameters:

a. pH:

_____

_____ (1)

b. Conductivity:

_____

_____ (1)

c. Calcium:

_____

_____ (1)

d. Nitrogen:

_____

_____ (1)

***Please turn the page.***

**Question 8** **K9 (4 marks)**

Describe how the following biotic and abiotic soil factors can affect plant growth:

| | **Soil Factor** | **Effect on plant growth** |
|---|---|---|
| a. | Soil bacteria | (1) |
| b. | Earthworms | (1) |
| c. | Soil Water | (1) |
| d. | Temperature | (1) |

**Question 9** **K10 (4 marks)**

List **ONE** activity that can improve soil fertility by:

a. increasing the availability of nutrients:

_____ (1)

b. promoting the control of diseases and insect pests that overwinter in the soil:

_____ (1)

c. increasing the activity of beneficial soil organisms such as decomposers:

_____ (1)

d. increasing soil aeration and the water infiltration capacity of the soil:

_____ (1)

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