

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD
UNIVERSITY OF MALTA, MSIDA

SECONDARY EDUCATION CERTIFICATE LEVEL

MAY 2017

SUBJECT:	Agribusiness
PAPER NUMBER:	Controlled – Unit 1
DATE:	25 th May 2017
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 _____

Scenario:

Right next to your school there is an abandoned field. Your school has decided to buy this land in order for the students to start practicing in the field what they learn in class. However, the school administration wants someone to take care of this field. Answer the following questions to show to the school administration that you are knowledgeable about plant and soil science.

Question 1

K1 (4 marks)

Label **ALL** the following figures using the structures below:

<i>Leaves</i>	<i>Stem</i>	<i>Root</i>	<i>Seed</i>	<i>Fruit</i>
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Figure 1 – The Garlic

Image modified from: <https://www.uaf.edu>



Figure 2 – The Carrot

Image modified from: <https://s-media-cache-ak0.pinning.com>



Figure 3 – The Jerusalem Artichoke

Image modified from: <http://media.gettyimages.com>



Figure 4 – The Tomato

Image modified from: <http://previews.123rf.com>

Please turn the page.

Question 2**K2 (4 marks)**

Link the term which describes the different plant body tissues, transport system and plant cell components.

Term	Description
Xylem	Living cells strengthened by the thickening of cell walls, as in young shoots.
Chloroplasts	The vascular tissue in plants which transports food substances.
Collenchyma	The vascular tissue in plants which transports water and salts.
Phloem	Are responsible for producing energy from food substances.
Mitochondria	Contains the green substance chlorophyll, enabling the cell to carry out photosynthesis.
Cell wall	Contains the genetic material of the cell.
Nucleus	It is non-selective and allows water and dissolved substances to pass through.
Vacuole	A large sac inside the plant cell that stores water and other substances.
Sclerenchyma	The semipermeable membrane surrounding the cytoplasm of a cell.
Cell membrane	Have thick lignified secondary walls and often die when mature.

Question 3

K3 (4 marks)

The picture below illustrates the life-cycle of a tomato plant. Label each stage in the space provided near each picture by choosing the correct word from the list below. Each word should be used only once.

Seedling	Germination	Flowering	Pollination
Seed dispersal	Seed	Growth	Fruiting

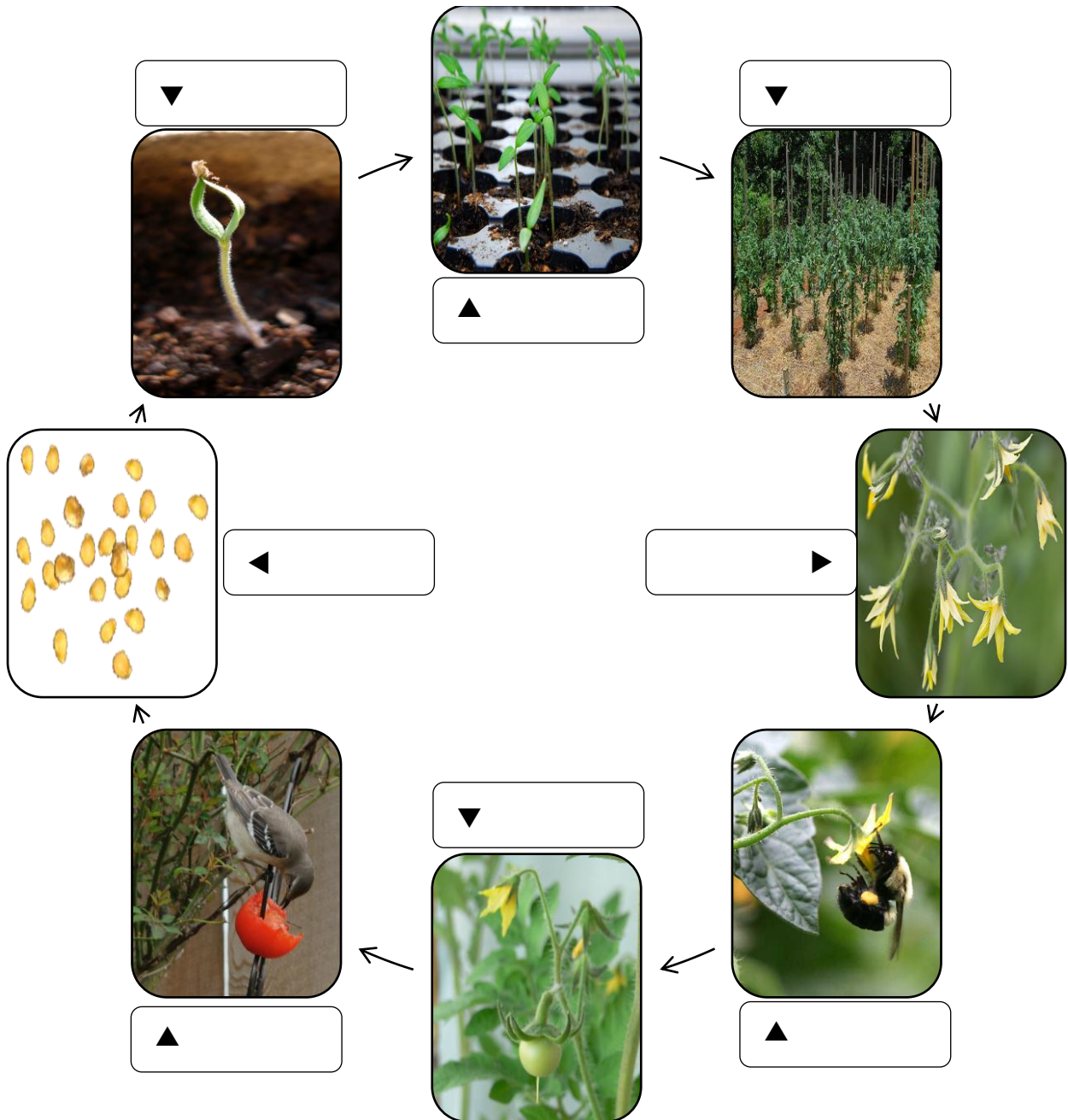


Figure 5 – The Lifecycle of the Tomato

Please turn the page.

Question 4

C1 (6 marks)

- a. Consider the following characteristics and identify whether they are associated with the onion or with the cabbage.

Characteristics	
i.	Has white flowers with parts in sixes.
ii.	Each flower has four petals set in a perpendicular pattern.
iii.	The fruit is made up of two fused carpels (known as a silique).
iv.	Vascular cambium is absent and vascular bundles are scattered.
v.	Vascular cambium is present and vascular bundles are in ring.
vi.	Has one cotyledon i.e. only one embryonic first leaf.
vii.	The seeds are glossy black and triangular in cross section.
viii.	Has two cotyledons i.e. two leaves inside the seed coat of a germinating seed.

Onion	Cabbage

- b. Wheat is a monocot and cucumber is a dicot. Explain the main difference in their leaves and roots structure.

Question 5**K5 (4 marks)**

Fill in the blanks by choosing **ONE** word from the following list to outline the fruits' and vegetables' nutritional features.

Sugars	Copper	Proteins	Fats	Vitamins	Minerals	Fibres
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Fruit and vegetables are power-packed foods – they are full of valuable nutrients which have lots of health benefits.

Different fruits and vegetables are rich in different nutrients. For example, whilst oranges are known to be a very good source of _____, the melon is rich in calcium, iron, and magnesium, which are all example of _____.

Fruits and vegetables provide us with energy since they contain _____, such as glucose and fructose. Unsaturated _____ are predominantly found in foods from plants, such as vegetable oils, nuts, and seeds and these may help lower your risk of heart disease.

Fruits and vegetables also contain _____, which helps us for growth and repair. However, unlike animal sources, fruits and vegetables only contain some of the nine essential amino acids that we cannot make ourselves, so they must be combined with other foods in order to ensure adequate intake.

Please turn the page.

Question 6

C3 (6 marks)

Consider the following extract:

Farmers use manure, which is the waste material from animals such as cows. Manure contains the essential nutrients needed for crops to grow well.

Discuss **THREE** advantages and **THREE** disadvantages of manure application in agriculture.

Advantage 1: _____

Advantage 2: _____

Advantage 3: _____

Disadvantage 1: _____

Disadvantage 2: _____

Disadvantage 3: _____

Question 7

K8 (4 marks)

Soil testing is an essential tool in determining the suitability of a soil for crop growth and production. Several parameters can be tested in a laboratory or even in the field. Write a short sentence to define how the following soil parameters would affect plant growth:

a. a **pH** of 8.5;

b. a good amount of **nitrogen** in the soil;

c. a good amount of **potassium** in the soil;

d. a high level of **conductivity** in the soil.

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Question 8

K9 (4 marks)

Soils are rich ecosystems, composed of both living and non-living matter with a multitude of interaction between them.

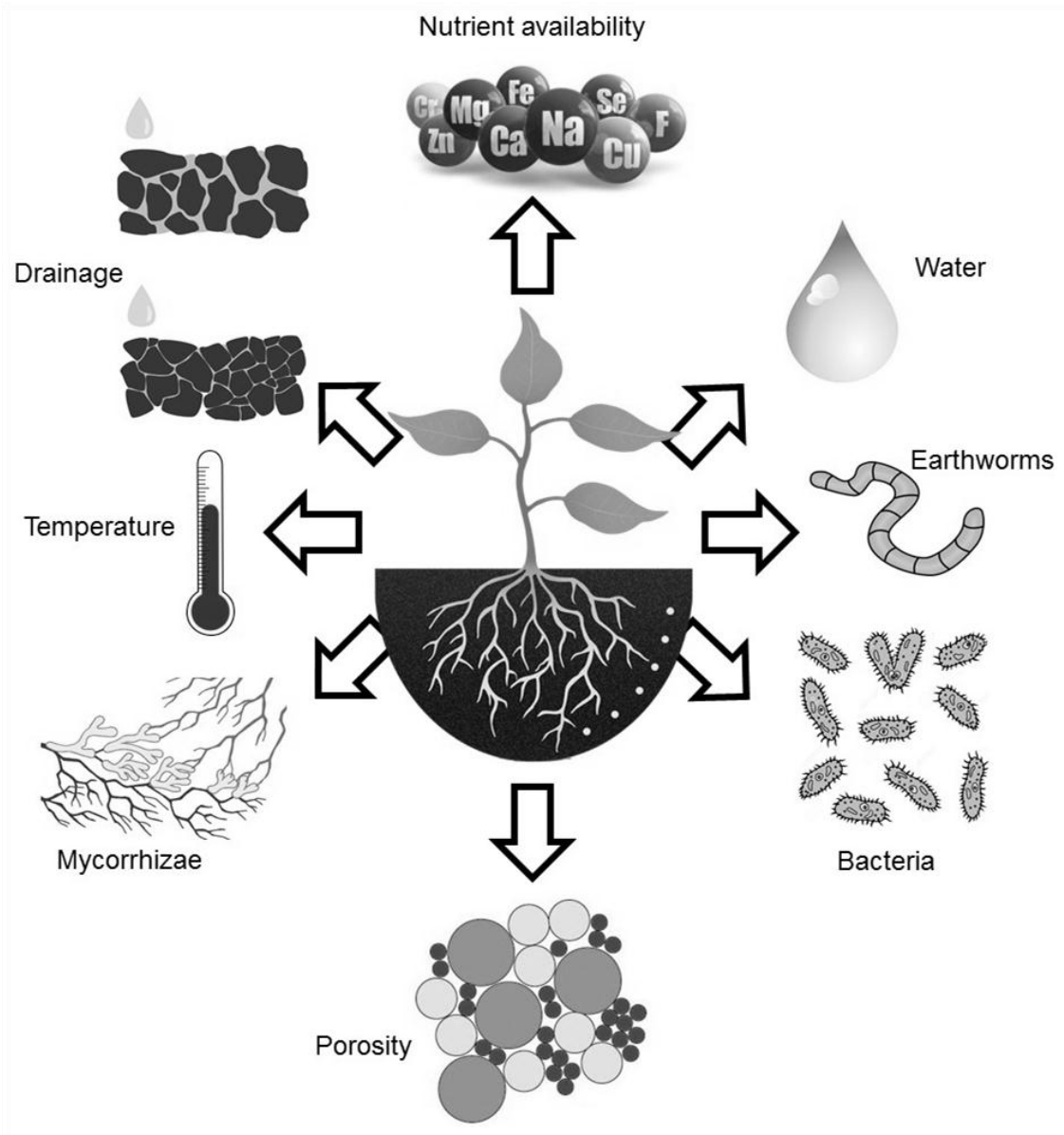


Figure 6 – Soil ecosystem

- a. List **TWO** main types of Maltese soils according to the World Reference Base of Soil Resources.

Type 1: _____

Type 2: _____

- b. Choose **TWO** biotic components listed in Figure 6 and describe **ONE** way of how they can affect plant growth.

Biotic Component		Description
i.		
ii.		

- c. Choose **TWO** abiotic components listed in Figure 6 and describe **ONE** way of how they can affect plant growth.

Abiotic Component		Description
i.		
ii.		

Question 9

K10 (4 marks)

What activities associated with improving soil fertility do the following descriptions refer to.

- a. A protective covering, such as bark chips, straw, or plastic sheeting, placed on the ground around plants to suppress weed growth, retain soil moisture, or prevent freezing of roots.

Activity: _____

- b. Turning over and breaking up the soil. It is helpful if you have severely compacted soil that needs to be broken up or any type of soil that needs to be broken into finer bits for planting seeds.

Activity: _____

- c. The application of calcium- and magnesium-rich materials to soil in various forms, including marl, chalk, limestone, or hydrated lime. Lime is a basic chemical, increasing the pH of acidic soils.

Activity: _____

- d. The practice of growing different crops in succession on the same land mainly to preserve the productive capacity of the soil.

Activity: _____

- e. Even though this can be man-made, these substances contain plant nutrients such as nitrogen, phosphorus, and potassium. This maintains the soil fertility, so the farmer can continue to grow nutritious crops and healthy crops.

Activity: _____

- f. This is increased to allow for more aeration within the soil.

Activity: _____

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- g. Can be a natural composition which improves soil by loosening and aerating clay soil and it improves the water- and nutrient-holding capacity of sandy soil.

Activity: _____

- h. Increase the volume of soil of a field.

Activity: _____

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