Index Number:_____ SEC35/s1.20s

L-Università ta' Malta

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD

SECONDARY EDUCATION CERTIFICATE LEVEL
2018 SUPPLEMENTARY SESSION

SUBJECT:	**Agribusiness**
PAPER NUMBER:	Synoptic – Unit 1
DATE:	2nd November 2018
TIME:	10:00 a.m. to 12:05 p.m.

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

Scenario:

Agriculture plays a crucial role in the life of an economy. Agriculture not only provides food and raw material but also employment opportunities to a very large proportion of the population.

Therefore, it is crucial that future generations have a thorough idea of the basic principles that govern agriculture and its related practices.

Question 1 **K1 (6 marks)**

Label Figures 1a, 1b and 1c using the structures below. Each sructure can only be used **ONCE**.

Leaves	*Stem*	*Root*	*Flower*	*Seed*	*Fruit*

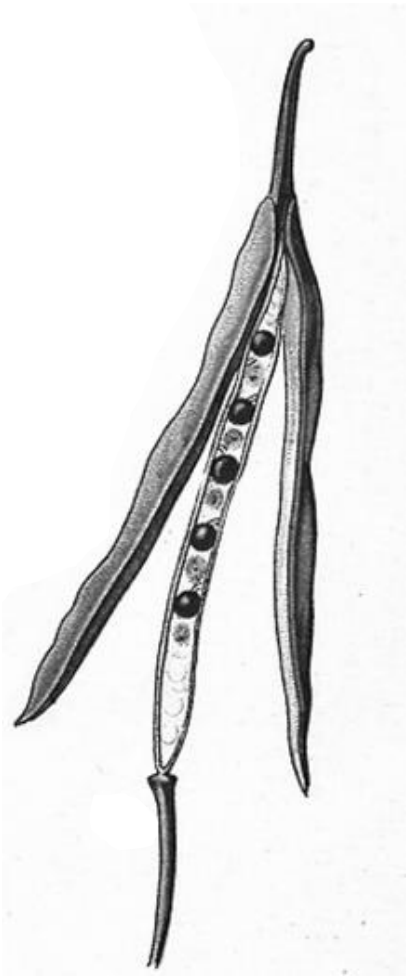

Figure 1a

Image modified from: https://www.delta-intkey.com/angio/images/kohl1009.jpg

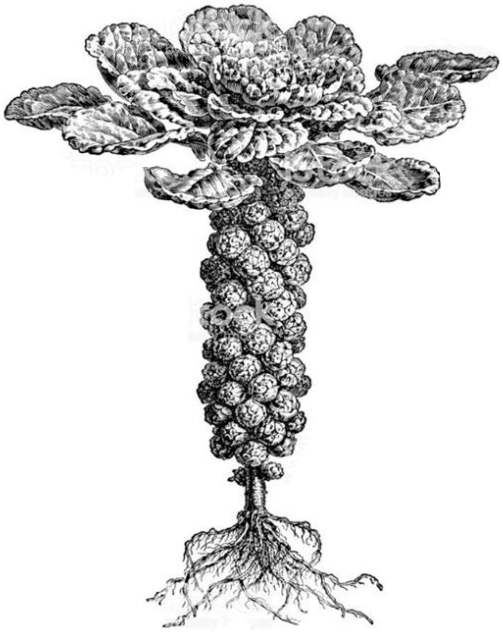

Figure 1b

Image modified from: https://bloomzine.com/nutrition/superfood-sundays-brussels-sprouts102013

Figure 1c

Image modified from: https://www.bvsd.org/curriculum/science/New%20Plants/New%20Plants%20Student%20Sheets.pdf

Please turn the page.

Question 2 **K2 (7 marks)**

Answer the following questions.

a. What is the main function of the chloroplast in the plant cell?

_____ (1)

b. Describe **TWO** properties of the xylem and phloem by referring to the vessels in Figure 2.

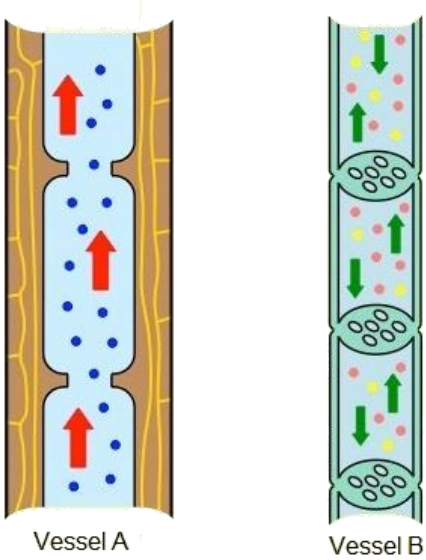

Figure 2 – The two main types of vessels in a plant.
Image obtained from: http://ib.bioninja.com.au

Xylem: _____

_____

_____ (3)

Phloem: _____

_____

_____ (3)

Question 3 **K3 (6 marks)**

Briefly outline what happens at each of the following stages in the life cycle of a cabbage plant.

	Stage	**Brief outline**
a.	Germination	
b.	Seedling	
c.	Flowering	
d.	Pollination	
e.	Fruiting	
f.	Seed dispersal	

Question 4 **C1 (10 marks)**

The wheat and the bean are an example of a monocot and a dicot plant respectively. Fill in the following table to explain the given morphological features of monocots and dicots.

Morphological features	**Monocots (Wheat)**	**Dicots (Bean)**
Number of cotyledons in seed		
Leaf venation pattern		
Number of flower parts		
Type of root system		
Distribution of vascular bundle		

Question 5 **K5 (4 marks)**

Outline **TWO** nutritional roles of the following:

a. Vitamin A in carrot and pumpkin;

_____

_____ (2)

b. Calcium in spinach and kale.

_____

_____ (2)

Question 6 **C5 (4 marks)**

Consider the following soil requirements of three crops.

	Optimum soil pH range	**Maximum soil conductivity without yield loss (ds/m)**
Cabbage	6.0 – 7.5	1.8
Tomato	5.5 – 7.5	2.5
Zucchini	5.5 – 7	4.7

Answer the following questions.

a. Which crop will suffer yield loss if the soil salinity is 2.3 ds/m?

_____ (1)

b. Suggest a pH value ideal for the three crops.

_____ (1)

c. Suggest a soil salinity value that would be ideal to cultivate all the three crops?

_____ (1)

d. Which crop will suffer if the soil pH is 7.5?

_____ (1)

Question 7 **A2 (15 marks)**

Provide **FIVE** Health and Safety equipment that you may use during the production of crops and ornamental plants to avoid injury and mention **TWO** horticultural activities in which you would use them. Health and Safety equipment and horticultural activities chosen should be mentioned only **ONCE**.

	Health and safety equipment	**Horticultural activity**
1.		
2.		
3.		
4.		
5.		

Question 8 **K6 (5 marks)**

Indicate which **ONE** of the following nutrients is required for the specific production objectives and deficiency symptoms. Each nutrient can only be used once.

Iron	Nitrates	Calcium	Potassium	Phosphorus

Production objective 1: To help foliage grow strong by affecting the plant's leaf development. It also helps with chlorophyll production.

Nutrient: _____ (1)

This question continues on the next page.

Production objective 2: Contribute to quality fruit production and help retain water. It also helps plants resist diseases and pests.

Nutrient: _____ (1)

Deficiency symptom 1: Purpling leaves.

Nutrient: _____ (1)

Deficiency symptom 2: Tip burn.

Nutrient: _____ (1)

Deficiency symptom 3: Interveinal chlorosis.

Nutrient: _____ (1)

Question 9 **C3 (8 marks)**

The following key properties are associated with positive and negative aspects of manure.

Weeds	*Humus*	*Pathogens*	*Drainage*
Nutrients	*Bad odours*	*Nutrient leaching*	*Water retention*

a. Select **TWO** key properties which are related to the advantages of manure and discuss such advantages.

Property 1: _____ (0.5)

Advantage: _____

_____ (1.5)

Property 2: _____ (0.5)

Advantage: _____

_____ (1.5)

b. Select **TWO** key properties which are related to the disadvantages of manure and discuss such disadvantages.

Property 1: _____ (0.5)

Disadvantage: _____

_____ (1.5)

Property 2: _____ (0.5)

Disadvantage: _____

_____ (1.5)

Question 10 **C4 (8 marks)**

Identify the potential hazard and explain the associated risk for each of the following scenarios.

Scenario	A farmer has been working in the sun for a long period of time.
Potential hazard	
Explanation of associated risk	

(2)

Scenario	A grower was using torn gloves.
Potential hazard	
Explanation of associated risk	

(2)

Scenario	A gardener did not want to use a lifter to pick up some heavy boxes and lifted them up himself.
Potential hazard	
Explanation of associated risk	

(2)

Scenario	A farmer was spraying pesticides without adequate eye protection.
Potential hazard	
Explanation of associated risk	

(2)

Please turn the page.

Question 11 **A3 (15 marks)**

Plant nutritional needs differ, so it is important to know what some plant deficiencies are in order to apply the correct fertiliser.

a. Fill in the following table by providing **ONE** deficiency symptom, **ONE** fertiliser and **ONE** method of application for each nutrient in the table. Choose the best fertiliser to use from the list provided below the table (each fertiliser in the list should be used only ONCE).

	Deficiency symptom	**Best fertiliser (choose from list below)**	**Method of application**
Nitrogen			
Phosphorus			
Potassium			

(12)

List of fertilisers
Ammonium Sulphate (21% N)
Triple superphosphate (0.45.0.)
Potassium Nitrate (13.0.46.)

b. Explain **TWO** safety precautions that you need to use when applying fertilisers to plants.

Safety precaution 1: _____ (1.5)

Safety precaution 2: _____ (1.5)

Question 12 **K8 (6 marks)**

A farmer wants to take soil samples to the laboratory for analysis. Choose **THREE** of the following and explain why these parameters are important to analyse in a soil sample.

pH	Sodium	Nitrogen	Potassium	Conductivity

a. Soil parameter 1	
b. Explanation as to why parameter is important to analyse	

(2)

a. Soil parameter 2	
b. Explanation as to why parameter is important to analyse	

(2)

a. Soil parameter 3	
b. Explanation as to why parameter is important to analyse	

(2)

Please turn the page.

Question 13 **K9 (2 marks)**

Underline **ONE** suitable biotic and/or abiotic soil factor for each of the following effects on plant growth.

a. Mixes the soil whilst burrowing, thus aerating it in the process.
   i. Mycorrhizae
   ii. Bacteria
   iii. Earthworms (0.5)

b. Provides nutrients and a suitable habitat to organisms living in the soil.
   i. Organic matter
   ii. Temperature
   iii. Drainage (0.5)

c. More of this will increase oxygen in the soil which will also be able to accommodate more water.
   i. Organic matter
   ii. Porosity
   iii. Soil water (0.5)

d. Species of these organisms play a vital role in fixing nitrogen within the nitrogen cycle.
   i. Mycorrhizae
   ii. Bacteria
   iii. Earthworms (0.5)

Question 14 **K10 (4 marks)**

List **FOUR** activities which improve soil fertility.

Activity 1: _____

Activity 2: _____

Activity 3: _____

Activity 4: _____