OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

ENVIRONMENTAL AND LAND-BASED SCIENCE

B491/01

Plant Cultivation
(Foundation Tier)

OCE/13167

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Electronic calculator
- Pencil
- Ruler (cm/mm)

Monday 22 June 2009
Morning

Duration: 45 minutes

B491 01

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.
- There are no separate marks for the quality of written communication, but make sure that your answers are written in clear and well-structured English.

INFORMATION FOR CANDIDATES

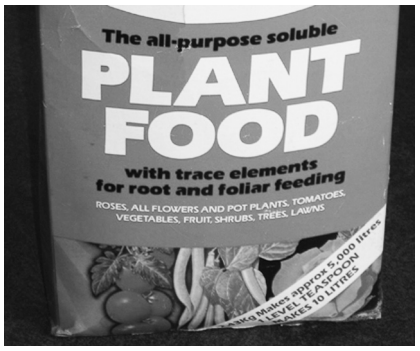
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Fertilisers can be either organic or inorganic.

The photographs below show some different types of fertilisers.

Farmyard Manure	Tomato feed	All purpose Plant food	Feed-all



Which **one** of these fertilisers is always organic?

..... **[1]**

2 The photograph shows a large flower of the Yellow Jessamine vine.

Use **P** and a label line to indicate only the petals. **[1]**

3 A seed needs certain conditions to germinate.

Which of the following is **not** needed for seed germination?

A nitrates

B oxygen

C warmth

D water

Answer **A**, **B**, **C** or **D** ..... **[1]**

4 The photograph shows a gardener weeding her flower border.

The gardener tries not to stand on the soil because she would:

A kill the earthworms

B remove air from the soil

C remove nutrients from the soil

D get muddy shoes

Answer **A**, **B**, **C** or **D** ..... **[1]**

5 Which is the best garden tool for removing weeds between rows of onions?

A fork

B hoe

C rake

D spade

Answer **A**, **B**, **C** or **D** ..... **[1]**

6 The diagram shows the **outside** of a germinating broad bean seed.

The part labelled **X** is the:

A cotyledons

B plumule

C radicle

D testa

Answer **A**, **B**, **C** or **D** ..... **[1]**

7 A gardener has two vegetables which are growing poorly.

- cabbages with small, yellow leaves
- tomato plants with only a few small fruits.

The following is a list of substances that the gardener can add to help growth.

ammonium nitrate
superphosphate
lime
fresh farmyard manure
potash

Choose from the list above which is the best substance to help growth:

of the cabbages

.....

of the tomato plants.

..... **[2]**

8 The diagram shows a tall and a short pea plant.

A scientist carries out a genetic cross between these two pea plants.

In each sentence, put a (ring) around the correct word that completes it.

All of the **dominant** **recessive** **F1** **gene** generation are tall.

This means that the gene for the tall pea plants is **dominant** **recessive** **weaker** **stronger**.

[2]

9 The diagram shows a wind pollinated flower.

It shows adaptations to help pollen transfer easily.

State and **explain** two adaptations of a wind pollinated flower.

adaptation 1:

.....

.....

adaptation 2:

.....

..... **[4]**

10 The photograph shows an example of asexual reproduction (vegetative propagation).

What is the name of the structure shown between the two plants?

..... **[1]**

11 The shaded areas show the pH values when important nutrients are most available in soil.

	soil pH value									
	acidic			neutral			alkaline			
	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5
nitrogen										
phosphorus										
potassium										
calcium										
magnesium										
sulfur										
iron										

(a) Name the nutrient available in the soil at pH 8.5.

..... **[1]**

(b) Which of the nutrients in the table is most available in acid soil?

..... **[1]**

(c) Over which range of pH values is calcium available?

from pH .....

to pH ..... **[1]**

12 Plants can be grown from seed.

The photographs show a stage in the transplanting of seedlings.

(a) What is this stage called?

..... **[1]**

(b) Why is this carried out?

..... **[1]**

13 A gardener wishes to improve a sandy soil by adding garden compost.

Suggest **two** ways in which this could improve the sandy soil.

.....

.....

.....

..... **[2]**

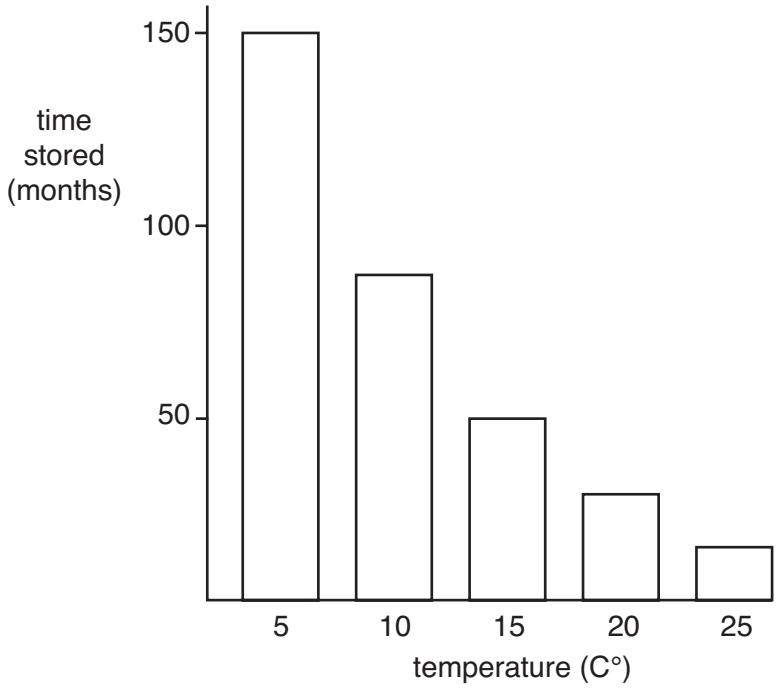
14 There may be disadvantages of adding garden compost to a soil.

Suggest **one** possible disadvantage.

..... **[1]**

15 Stored grain loses quality over time.

The bar chart shows the effect of temperature on the length of time grain can be stored without perishing.



Look at the bar chart.

Describe the effect of temperature on the length of time grain can be stored.

.....

..... **[1]**

16 Stored grain loses quality over time.

The table shows the effect of temperature on the length of time grain can be stored in months **at different moisture contents**.

Each column is for a different grain moisture content.

grain temperature °C	**time (months) grain can be stored at different moisture contents**					
	13%	**14%**	**15%**	**16%**	**17%**	**18%**
5	150.0	61.0	29.0	15.0	9.4	6.1
10	84.0	34.0	16.0	8.9	5.3	3.4
15	47.0	19.0	9.2	5.0	3.0	1.9
20	26.0	11.0	5.2	2.8	1.7	1.1
25	15.0	6.0	2.9	1.6	0.9	0.9

(a) A farmer stores grain at 15 °C and at a grain moisture content of 15%.

How long can it be stored for?

..... **[1]**

(b) Another farmer stored grain at 15 °C and at a moisture content of 16% but then reduced the temperature of his stored grain to 5 °C.

How many times longer can this grain be stored now?

..... **[1]**

17 The photograph shows a student moving a large plant.

State **one** hazard to the student.

How could this be overcome?

hazard .....

solution ..... **[2]**

18 A farmer is grazing sheep in a field.

He wants to grow crops in the field instead.

The tree might affect the farmer's crops.

How might the crops under the tree differ from those in the rest of the field?

Explain your answer.

.....

.....

..... **[2]**

19 The photograph shows a commercial glasshouse.

A grower wants to improve the growing conditions in the glasshouse using ICT.

Give **two** examples of ICT in the glasshouse.

Explain how using them would improve plant growth.

1 .....

.....

2 .....

..... **[3]**

20 The photograph shows a healthy plant.

Describe **three** things that show a plant is healthy.

1 .....

.....

2 .....

.....

3 .....

..... **[3]**

END OF QUESTION PAPER

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