

GCSE

ADDITIONAL APPLIED SCIENCE A

AP2 Agriculture and Food

Specimen Paper

Candidates answer on the question paper:

Additional materials: ruler (cm/mm), calculator

H **A334/02**

45 mins

Candidate
Name

--

Centre
Number

--	--	--	--	--

Candidate
Number

--	--	--	--

TIME 45 mins

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers on the dotted lines unless the question says otherwise.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for a correct method even if the answer is incorrect.
- Do not write in the bar code. Do not write in the grey area between the pages.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

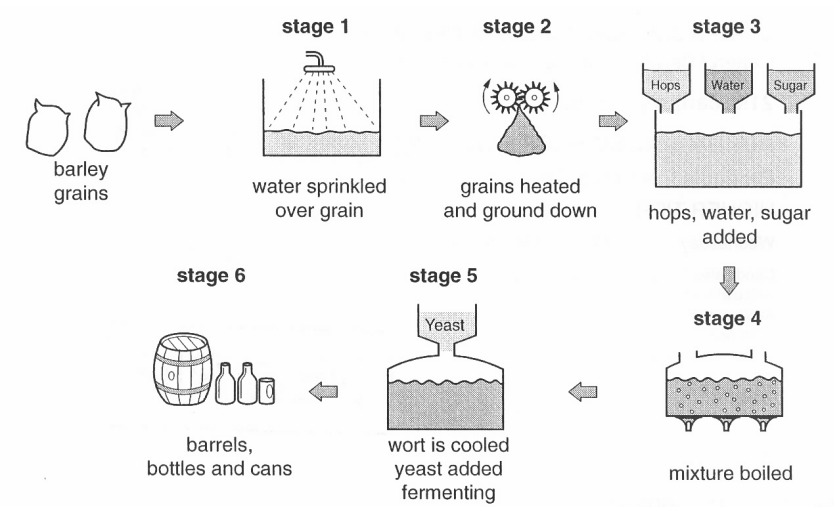
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **36**.

This specimen paper consists of 15 printed pages.

BLANK PAGE

Answer all questions.

1. Look at the diagram showing stages in brewing beer.



(a) In **stage 1**, water is added to the barley grains.

The water is needed by enzymes inside the barley grains.

Describe what the enzymes do to the starch stored inside the barley grains.

.....

[2]

(b) (i) Suggest why the mixture is boiled in **stage 4**.

.....[1]

(ii) Why is the yeast added after the wort is cooled?

.....[1]

(c) Fermentation is a result of anaerobic respiration of yeast.

Finish the word equation for anaerobic respiration.

Use words from this list.

- alcohol
- carbon dioxide
- oxygen
- starch

sugar ⇒ _____ + _____

[2]

(d) A brewer needs to know when the fermentation has stopped.

Describe one simple qualitative way and one accurate (quantitative) way of finding out.

simple way.....

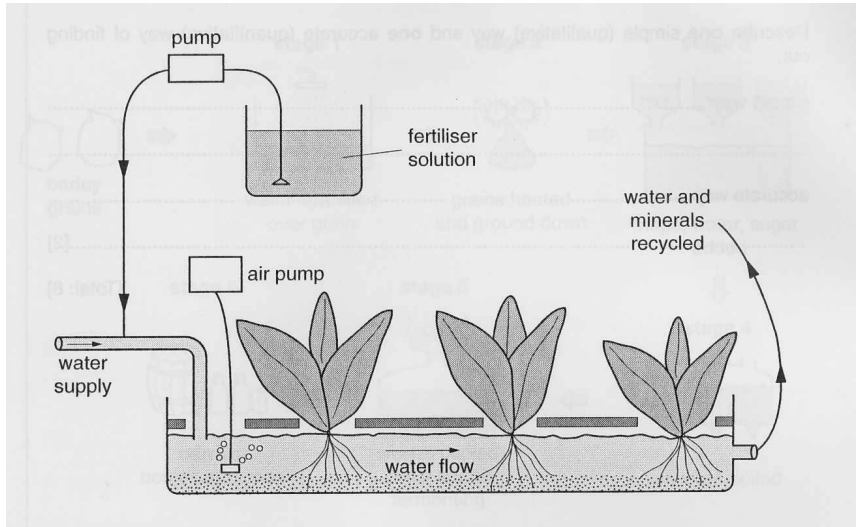
.....

accurate way

.....[2]

[Total: 8]

2. Charlie uses a hydroponic technique to grow lettuce.



(a) Lettuce can be grown either by using a hydroponic technique or in soil.

Write down **one** advantage and **one** disadvantage of using a **hydroponic** technique.

advantage.....

.....

disadvantage

.....[2]

(b) Explain how the air pump helps the lettuce to grow.

.....

.....

.....

.....[2]

(c) The lettuce plants carry out photosynthesis.

The faster the rate of photosynthesis, the faster the lettuce will grow.

Name **two** environmental factors that will increase the rate of photosynthesis.

- 1.
- 2.[2]

(d) Scientists are interested in using hydroponics in space.

Suggest why.

-
-
-
-[2]

[Total: 8]

- 3. Banana plants are being attacked by a virus disease called Vascular Wilt.

The plant cells that normally conduct water and minerals to the leaves become blocked.

The whole banana plant wilts.



UNIVERSITY OF WISCONSIN-RIVER FALLS
(www.uwrf.edu)

- (a) Explain how Vascular Wilt disease results in a poor crop of bananas.

.....

.....

.....

.....[2]

- (b)** Wild banana plants reproduce sexually and are immune to Vascular Wilt disease.

Nearly all the cultivated banana plants in the world have come from one type of banana, called Cavendish.

These plants are sterile so cuttings are taken and planted.

- (i)** Discuss the advantages and disadvantages of using cuttings to grow banana plants.

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

- (ii)** Scientists are trying to use selective breeding to develop a new type of banana plant.

Explain the importance of wild banana plants to this process.

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

[Total: 8]

4. Scientists have produced a giant pig.

They put the gene for human growth hormone into a chromosome in a pig egg.

The egg developed into a giant pig.

(a) Describe how the gene for human growth hormone can be obtained from a human cell.

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

(b) How is the information coded in a gene?

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

(c) What does the cell do with this coded information?

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

[Total: 6]

5. The food and agriculture sector is regulated.

Give **two** examples of organisations responsible for regulation and explain their role.

1.
.....
.....
.....[3]

2.
.....
.....
.....[3]

[Total: 6]

BLANK PAGE



GCSE

ADDITIONAL APPLIED SCIENCE A

AP2 Agriculture and Food

Specimen Mark Scheme

Maximum mark for this paper is [36]

H

A334/02

45 mins

This specimen mark scheme consists of 4 printed pages.

Question Number	Answers	Max Mark
<p>1(a)</p> <p>1(b)i</p> <p>1(b)ii</p> <p>1(c)</p> <p>1(d)</p>	<p>Break it down; Digest it; To simple sugars; Make soluble any two</p> <p>Sterilise</p> <p>Boiling would kill yeast</p> <p>Alcohol; Carbon dioxide</p> <p>Simple: Seeing when bubbling stops; Accurate: Use hydrometer/measure alcohol content</p> <p style="text-align: right;">Total marks</p>	<p>[2]</p> <p>[1]</p> <p>[1]</p> <p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[8]</p>
<p>2(a)</p> <p>2(b)</p> <p>2(c)</p> <p>2(d)</p>	<p>Advantage: Does not depend on soil/more productive/uniform results/easier to control pests/diseases/fertilisers; Disadvantage: Plants need support/setting up costs/running costs e.g. pumps</p> <p>Provide oxygen; For respiration (of roots); Release energy; To make new cells any two</p> <p>Light; Carbon dioxide; Temperature any two</p> <p>Can be automated; Doesn't need soil; Recycles water/excess minerals; Supplies oxygen to the crew; Uses up carbon dioxide from the crew any two</p> <p style="text-align: right;">Total marks</p>	<p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[8]</p>

Question Number	Answers	Max Mark
<p>3(a)</p> <p>3(b)i</p> <p>3(b)ii</p>	<p>Less water/minerals to leaves; Less photosynthesis; Less carbohydrates/fats/proteins/chlorophyll; Less growth therefore poor crops</p> <p>any two</p> <p>Advantages: high volume of crops/independent of pollination/fertilisation Disadvantages: restricted gene pool, prone to disease</p> <p>1 mark for answer limited to only one advantage or disadvantage, 2 marks for one advantage (uniform shape/taste/size/faster etc) and one for disadvantage (no variety/choice etc), Develops argument. 1 mark for developing only one side of argument, 2 marks for developing both sides.</p> <p>Can use sexual reproduction; To get variation Idea of gene pool to select from</p> <p style="text-align: right;">Total marks</p>	<p>[2]</p> <p>[3]</p> <p>[3]</p> <p>[8]</p>
<p>4(a)</p> <p>4(b)</p> <p>4(c)</p>	<p>From DNA (in nucleus); By restriction enzymes</p> <p>Sequence of bases; Paired bases Named paired bases</p> <p>any two</p> <p>Order of bases provides code for particular protein; Producing hormone/enzyme affecting growth</p> <p>Accept details of mRNA, ribosome</p> <p style="text-align: right;">Total marks</p>	<p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[6]</p>

Question Number	Answers	Max Mark
5	Valid organisation; Correct role and explanation; Valid organisation; Correct role and explanation	[1] [2] [1] [2]
	Total marks	[6]
	Overall total	[36]