

Answer ALL the questions. Write your answers in the spaces provided.

1. Read this account.

One morning Mrs Jones bought a frozen chicken. She put the frozen chicken on the kitchen table to defrost for one hour. She then cooked the chicken for lunch. She cooked the chicken until the skin was brown then left it to cool by an open window.
The Jones family ate their chicken salad for lunch. They said that the chicken was very juicy.
The next day all the family were sick.

(a) Suggest the name of a micro-organism that may have caused the family to become sick.

.....
(1)

(b) Some of Mrs Jones' actions may have caused the family to be sick. Explain how two of these actions caused sickness.

Action 1

.....

.....
(2)

Action 2

.....

.....
(2)

(Total 5 marks)

Q1



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2. Soy sauce is made in two stages.

In stage 1, the fungus *Aspergillus* is used to ferment mashed up soya beans and roasted wheat.

In stage 2, yeasts and the bacterium *Lactobacillus* are used to ferment the mixture again before it is filtered, pasteurised and bottled.

(a) Soya beans have a high protein content.

Describe the features of the fungus *Aspergillus* which make it suited for stage 1.

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.....

(2)

(b) State how the bacterium *Lactobacillus* lowers the pH in stage 2.

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(1)

(c) Explain why the mixture is filtered in stage 2.

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(1)

(Total 4 marks)

Q2



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4. (a) (i) State how a disinfectant is **similar** to an antiseptic.

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(1)

(ii) State how a disinfectant is **different** from an antiseptic.

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(1)

(b) State a situation where an antiseptic would be better to use than a disinfectant.

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(1)

(Total 3 marks)

Q4



5. Ellie is going to produce some apple trees by tissue culture (micro-propagation).

(a) Ellie considers three methods to sterilise the equipment she is going to use.

- using an autoclave
- leaving in boiling water for five minutes
- soaking in disinfectant

She decides to use the autoclave.

Explain why the other two methods may not be as good for sterilising the equipment and using it for tissue culture.

boiling water

.....

disinfectant

.....

(2)

(b) Ellie selects some leaves from a plant which has the characteristic that she wants.

She cuts the leaf into small pieces called explants.

Each piece is carefully put onto sterile nutrient agar using sterile equipment.

The petri dishes are left in an incubator.

After three weeks, Ellie finds that the explants have gone mouldy.

Suggest what she should have done before she put the explants on the agar.

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(2)



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- (c) All plants produced by tissue culture are clones.
State the form of cell division that produces the new plants in tissue culture.

.....
(1)

- (d) Apart from producing clones, state an advantage of producing plants through tissue culture.

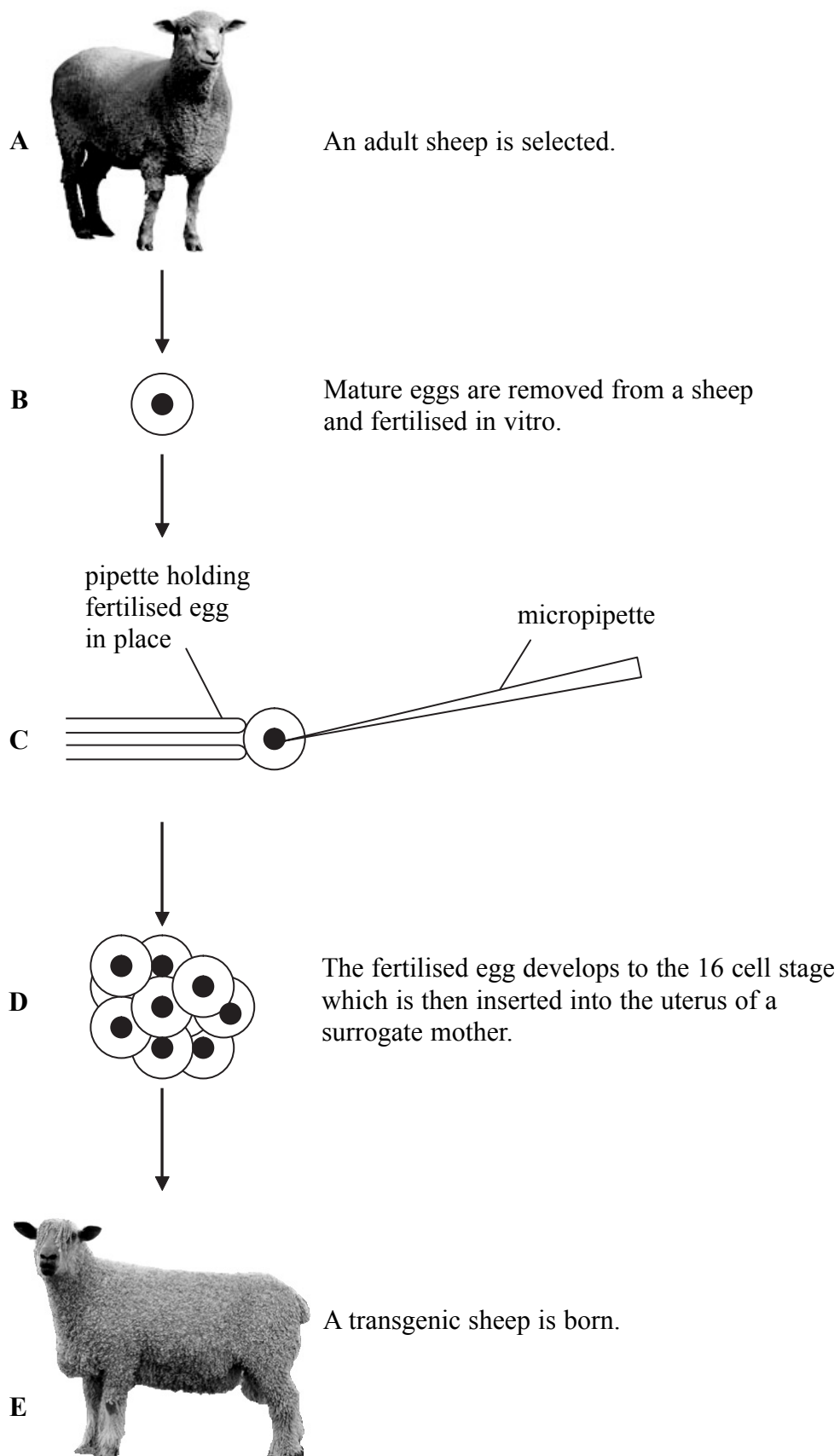
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(1)

(Total 6 marks)

Q5



6. The diagram shows some stages in creating transgenic sheep to produce useful proteins that can be used to treat human disorders.



Sources: www.extension.umn.edu
and © Wensleydale Longwool Sheep Breeders' Association



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(a) Describe the processes that occur during stage C.

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.....
.....

(2)

(b) State **two** features the transgenic sheep at stage E must have before it is cloned to produce a flock of transgenic sheep.

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.....

(2)

(c) Describe how useful substances, produced by the transgenic sheep, are obtained and processed.

.....
.....
.....
.....

(2)

Q6

(Total 6 marks)

TOTAL FOR PAPER: 30 MARKS

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