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Level 1 Biology, 2016

90927 Demonstrate understanding of biological ideas relating to micro-organisms

9.30 a.m. Wednesday 23 November 2016

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to micro-organisms.	Demonstrate in-depth understanding of biological ideas relating to micro-organisms.	Demonstrate comprehensive understanding of biological ideas relating to micro-organisms.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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QUESTION ONE: PRESERVING FOOD

Fresh food can be spoiled and go off due to the presence of micro-organisms. Freeze-drying is one way of preserving food so that it can be stored for a long time before use. The diagram below shows how freeze-drying is carried out.

Freeze-drying – How does it work?

Adapted from: <http://www.lio-licious.com/useful-info>

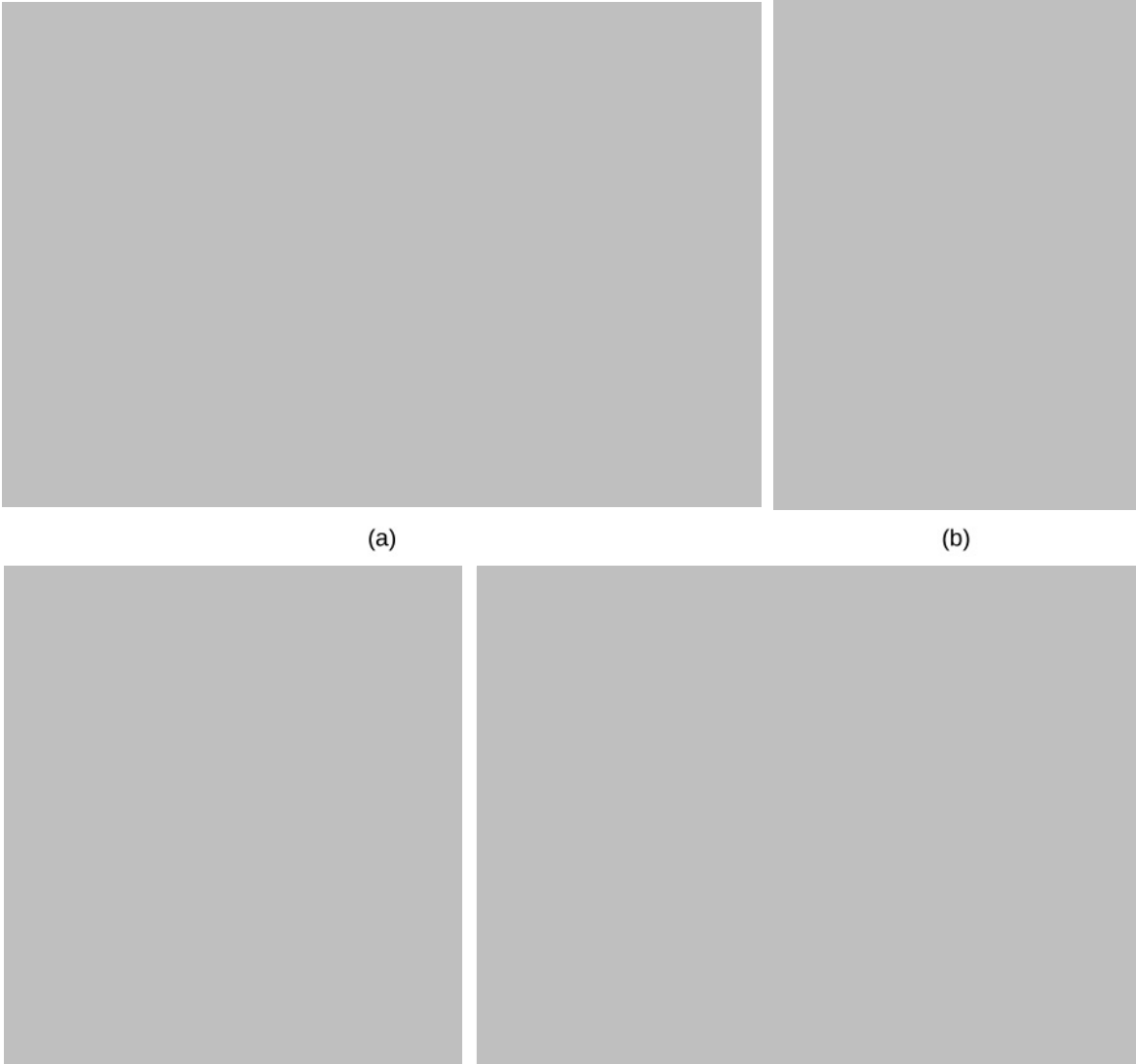
Discuss how the process of freeze-drying helps to preserve food.

Your answer should:

- describe the environmental factors required for micro-organisms to carry out life processes
- describe where the micro-organisms that spoil food come from
- explain how micro-organisms carry out life processes that cause food to spoil or go off
- explain what the freeze-drying process does that helps to preserve food.

QUESTION TWO: FUNGI AS PLANT PATHOGENS

Loss of crops or food spoilage due to fungal diseases caused by fungal pathogens can have a large impact on human food supplies.



(a) (b)

(c) (d)

Some fungal pathogens include (a) green mould on grapefruit, (b) powdery mildew on a zinnia, (c) stem rust on barley, and (d) grey rot on grapes.

Source: www.boundless.com/biology/textbooks/boundless-biology-textbook/fungi-24/fungal-parasites-and-pathogens-152/fungi-as-plant-animal-and-human-pathogens-600-11819

Discuss how fungi feed, grow, and reproduce as pathogens on plants, and how damage to crops or food spoilage from fungal pathogens can be minimised.

Your answer should:

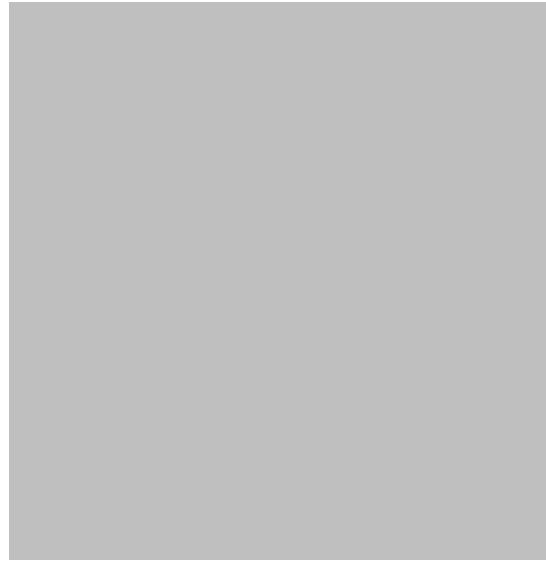
- define the term pathogen
- explain how fungi feed, grow, and reproduce on plants
- explain how environmental factors allow fungi to grow quickly on plants
- explain how crop damage or food spoilage from fungal growth could be minimised
- compare the links between the methods used to control fungi and the expected changes to fungal growth and reproduction.

QUESTION THREE: NUTRIENT CYCLING

Nitrogen and carbon are two essential nutrients cycled by micro-organisms.

The Nitrogen Cycle

Sources: https://en.wikipedia.org/wiki/Nitrogen_fixation

The Carbon Cycle

www.thinglink.com/scene/700750299547041793

Compare and contrast the role of micro-organisms in nutrient cycling in the nitrogen and carbon cycles.

Your answer should:

- describe the role of micro-organisms in nutrient cycling in the nitrogen cycle
- describe the role of micro-organisms in nutrient cycling in the carbon cycle
- explain why nutrient cycling is important to the ecosystem
- discuss the similarities and the differences in the role of micro-organisms in nutrient cycling for the nitrogen and the carbon cycles.

**Extra paper if required.
Write the question number(s) if applicable.**

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QUESTION
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