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90927



## Level 1 Biology, 2012

# 90927 Demonstrate understanding of biological ideas relating to micro-organisms

9.30 am Thursday 15 November 2012 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 microorganisms. | 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.

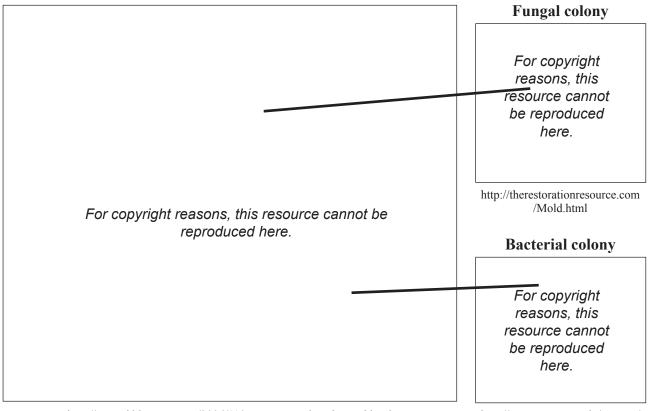
TOTAL

You are advised to spend 60 minutes answering the questions in this booklet.

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#### QUESTION ONE: CULTURING MICROBES

A nutrient agar plate was left open on the bench in a laboratory. It was then sealed up and incubated at 25°C. The photo below shows the plate after a few days, with smaller images of similar colonies shown magnified under a microscope.



http://pruned.blogspot.com/2006/11/yet-more-gardens-in-petri.html

http://water.me.vccs.edu/courses/ env211/lesson14\_2.htm

The plate shown has colonies of both bacteria and fungi.

Discuss the growth of colonies shown on the plate.

In your answer you should:

- describe the conditions needed for micro-organisms to reproduce
- describe how the micro-organisms arrived on the plate
- explain the relationship between the structures and functions of the micro-organisms, and how they look on the plate
- explain why bacteria and fungi have survived and reproduced on the agar plate, but viruses have not.

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### **QUESTION TWO: PRESERVING FOOD**

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http://www.clker.com/clipart-canned-food.html

Fruit and vegetables can be canned so that they can be stored for a long time. Analysis of food canned over 45 years ago shows it to be safe to eat.

When food is canned, the can and its contents are heated to very high temperatures and then quickly sealed with a sterilised lid to exclude any air.

| n your answer you should re | ate each of these | e ways to the life | processes of micro-organ |
|-----------------------------|-------------------|--------------------|--------------------------|
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| In your answer you should refer to the life processes of micro-organisms.  |  |
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| in your answer you should refer to the fire processes of finero organisms. |  |
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#### **QUESTION THREE: SEWAGE TREATMENT**

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| lı<br>S | vage contains water-borne waste from toilets and household waste water, along with some astrial waste and storm water. The main aim of sewage treatment is to remove or reduce solid ate and organic material. Once this is done, the water can be safely discharged into rivers or the The diagram below shows a typical sewage treatment plant. |
|---------|---|
|         | For copyright reasons, this resource cannot be reproduced here.   |
|         | http://pakwatercare.org/systems-2/waste-water-treatment/  |
| )       | Explain why sewage treatment is important.  |
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| (b) | During secondary treatment, sewage enters an aeration tank. The tank contains bacteria, and has air pumped into it. | ASSESSOR'S<br>USE ONLY |  |  |  |
|-----|---|------------------------|--|--|--|
|     | Discuss the role of bacteria in the aeration tanks during treatment of sewage.                                      |                        |  |  |  |
|     | In your answer you should:  |                        |  |  |  |
|     | • describe the role of the bacteria in the sewage plant and explain how this relates to their life processes        |                        |  |  |  |
|     | • explain the significance of air being added into the aeration tank  |                        |  |  |  |
|     | • consider the raw materials that enter the tanks and the products generated from the bacterial action.             |                        |  |  |  |
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| QUESTION<br>NUMBER | Extra paper if required. Write the question number(s) if applicable. |  |
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