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Level 1 Science, 2006

90188 Describe aspects of biology

Credits: Five
9.30 am Tuesday 28 November 2006

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 answer 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 2–10 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.

For Assessor's use only	Achievement Criteria	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe aspects of biology. ✓	Explain aspects of biology.	Discuss aspects of biology.
Overall Level of Performance A		

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You are advised to spend 40 minutes answering the questions in this booklet.

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QUESTION ONE: BACTERIA AND FUNGI

(a) Describe how bacteria reproduce. A diagram may help your answer.

Bacteria reproduce by binary fission Step 1 - Normal Bacteria. Step 2. The bacterias DNA replicates. Step 3 - The cell wall pinches down the middle. Step 4 DNA moves to opposite sides of cell & cell wall fully pinches down the middle to form a new bacteria.

A

(b) What is the **main condition** that causes bacteria to undergo anaerobic respiration?

Fermentation

N

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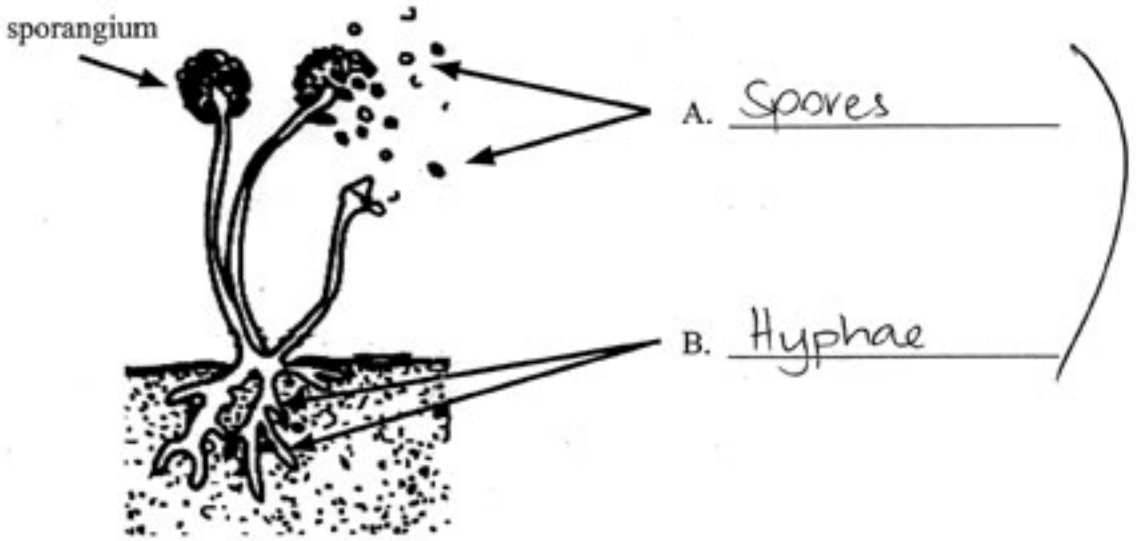
(c) Label the TWO parts of a fungus indicated on the diagram below.



A

(d) Explain why the sporangia in the diagram are **above** the surface. They are above the surface so that when they reproduce by releasing the spores when the sporangium bursts, the wind can catch them and then the spores will settle on a new food source and grow again //

M

(e) Compare and contrast **digestion** and **reproduction** in bacteria **and** fungi.

– BACTERIA –		– FUNGI –	
DIGESTION	REPRODUCTION	DIGESTION	REPRODUCTION
- Extra cellular digestion, by releasing digestive enzymes then are broken down, absorbing nutrients through the cell wall. -	Binary fission - Replicating DNA	- Extra cellular digestion except absorbed nutrients back through the hyphae	Bursting of sporangium releasing spores - relying on the wind to carry spores onto a new food source

A

The picture shows two forms of milk. On the left is liquid milk; on the right is milk powder.

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(f) In terms of **temperature** and **water content**, discuss why milk powder can be stored for a longer time than liquid milk.

Milk ponder can be stored longer than milk itself as this is the dehydrated form of milk. It does not contain liquid so the conditions for bacteria to grow is poor as the bactena need maisture & warmth to grow. so the milk powder therefore does not go off as fast as normal milk because of water content. Normal milk will last for a while when kept in cold conditions in the fridge as this slows down bactena reproduction processes. but does not fully stop it~~from~~. If milk is kept in the sun, it goes off quicker as it warms up speeding up bacteria grouth, making it go off quicker //

M

QUESTION TWO: VIRUSES

Assessor's use only

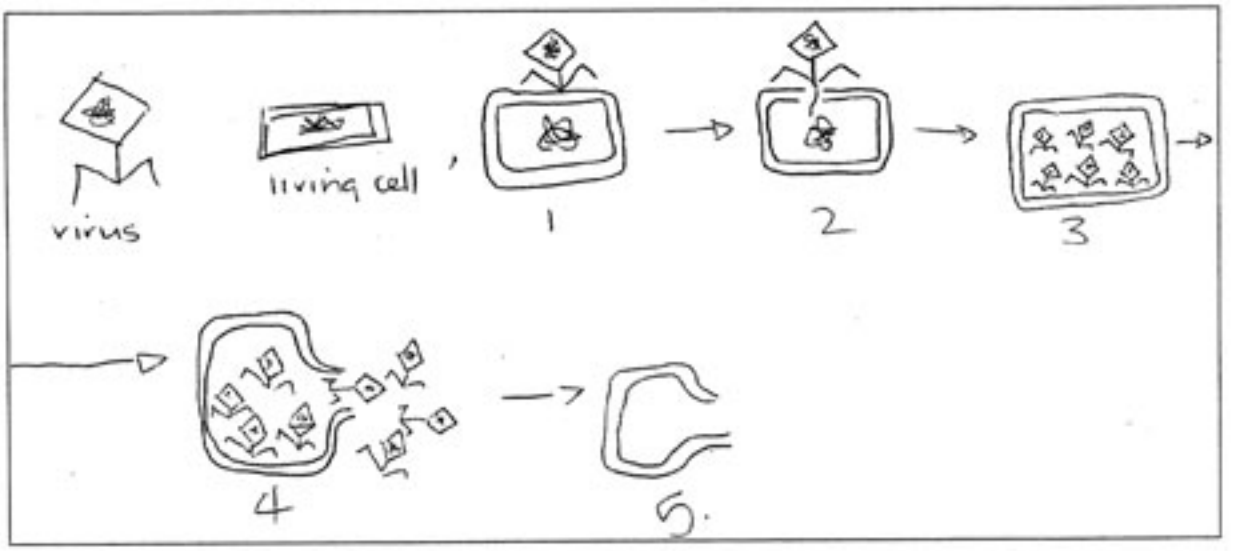
Cold sores are caused by a virus.

(a) Describe why a virus such as the cold sore virus can **not** be cultured on a nutrient agar plate.

Viruses such as cold sores cannot be cultured on an agar plate as it needs a living host cell to breed into and grow & feed off. //

N

(b) Explain how viruses reproduce. You may draw diagrams to support your answer.



1. Virus attatches itself to a living host cell. 2. It ~~injects~~ pierces cell wall and injects its DNA into living host cell. 3. Virus instructs living host cell to replicate/make more of virus, it feeds and grows them. 4. Living host cell becomes full of viruses and bursts, releasing all new viruses. 5. Living host cell dies.
- This process carries on in a circle.

A

QUESTION THREE: GENETICS

Assessor's use only

A

(a) There are 78 chromosomes in the body cell of an adult Shar-Pei dog. How many are found in the gamete?

39

(b) Define the term heterozygous.

hetero meaning 2 different.
So heterozygous meaning Male & female. or // 2 different things, homo being 2 of the same. //

N

In a Shar-Pei dog, the length of its coat is controlled by a gene. Normal coat (short) (**N**) is dominant to long coat (**n**). A male dog is **heterozygous** for normal coat.

The dog is crossed with a female dog that has the **same genotype**.

(c) Complete the Punnett Square.

Female genotype:

Male genotype:

A

(d) Give the **phenotype ratio** of the offspring of the cross.

75:25 3:4 //

N

(e) This cross resulted in eight puppies, **two** of which had a **normal** coat. Explain why this differs from the ratio in Question 3(d). → 3:4

Because 75% of the puppies in question 3d had normal coats and only 2 had a long coat. - 1:4 The normal coat was the dominant gene in question 3d but in this question the normal coat must have been the recessive gene to only have 2 out of 8 puppies with normal coat

Assessor's use only

N

(f) Discuss how you could determine whether a normal-coat dog was **homozygous** or **heterozygous**. You may use Punnett squares to help answer the question.

By mateing the normal coat dog with another female. If the puppies are all normal coated then the normal coat dog is homozygous. If you mated the normal coat dog with another heterozygous female and 25% of the dogs turned out with long hair then you would be able to determine that your dog was heterozygous.

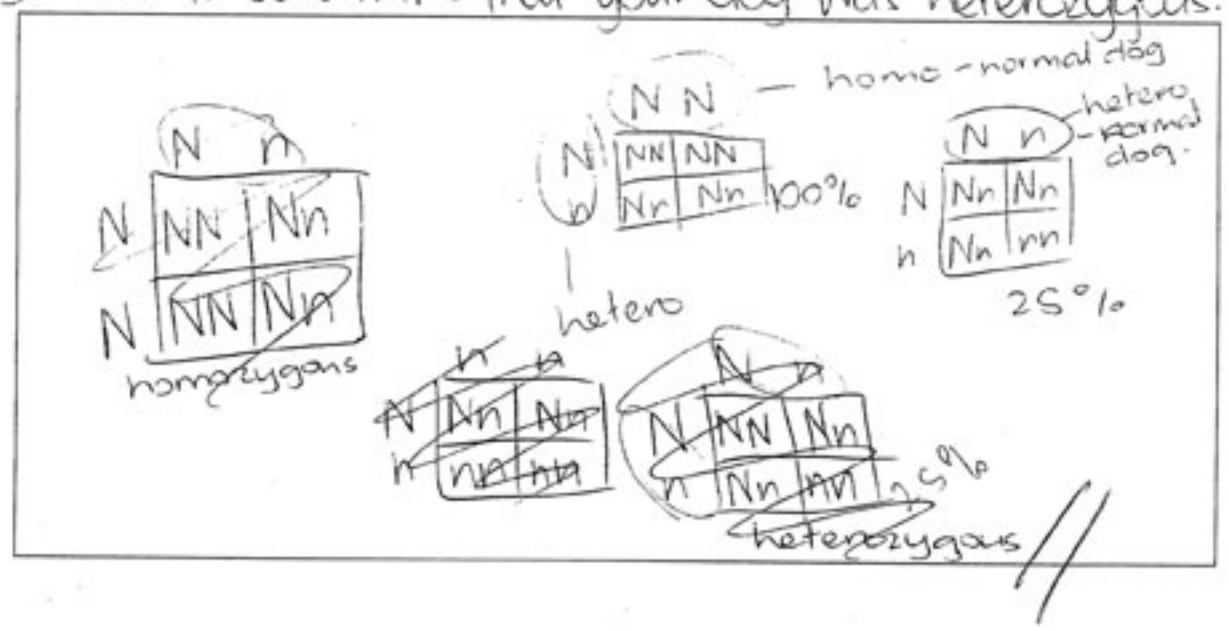
hetero zygous

homo

the male

male dog

N



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QUESTION FOUR: CLONING

Assessor's use only

Scientists in South Korea have claimed to have produced the first cloned dog.

Snuppy, whose name stands for Seoul National University puppy, was made from a cell taken from the ear of a three-year-old male Afghan hound.

Discuss why a dog produced by cloning looks identical to the biological parent, whereas a dog produced by sexual reproduction looks different from the parent.

A dog that is produced by cloning looks identical to its biological parent as all of the ~~dog~~ parents ~~cells~~ chromosomes are going to be the same as the puppies instead of half from mother & half from the father.
Dogs reproduced by sexual reproduction look different from each parent as half of each parents chromosomes have joined to form one so not all characteristics will be same as parents ~~are~~ have only given half of their chromosomes ~~from the parent are to the puppy~~. to the puppy, so not all characteristics will be the same, they'll be mixed.