

Surname						Other Names					
Centre Number						Candidate Number					
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For Examiner's Use

General Certificate of Education
June 2008
Advanced Level Examination



BIOLOGY (SPECIFICATION B)
Unit 8 Section A Behaviour and Populations

BYB8/A

Wednesday 18 June 2008 1.30 pm to 3.45 pm

For this paper you must have:

- Section B provided as an insert (enclosed)
- a ruler with millimetre measurements.

You may use a calculator.

Time allowed: The total time for Section A and Section B of this paper is 2 hours 15 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. **Answers written in margins or on blank pages will not be marked.**
- Use page 16 if you need extra space for your answers.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for **Section A** is 50.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.
- Use accurate scientific terminology in all answers.
- You are advised to spend 1 hour on **Section A**.
- You are reminded that **Section A** requires you to use your knowledge of different parts of the specification as well as Module 8 in answering synoptic questions. These questions are indicated by the letter **S**.

For Examiner's Use			
Question	Mark	Question	Mark
1			
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7			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			



J U N 0 8 B Y B 8 A 0 1

There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



SECTION A

Answer **all** questions in the spaces provided.

1 (a) (i) Describe how atheroma forms.

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(2 marks)

(Extra space)

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1 (a) (ii) Lack of exercise increases the probability of atheroma forming. Explain why.

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(1 mark)

(Extra space)

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1 (a) (iii) Other than lack of exercise, give **two** factors that increase the risk of atheroma forming.

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(2 marks)

1 (b) Atheroma may lead to a myocardial infarction. Explain how.

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(2 marks)

(Extra space)

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7

Turn over ►



2 Centchroman is a substance used in some countries as an oral contraceptive.

The table shows information about the centchroman pill and the combined oestrogen and progesterone contraceptive pill.

	Centchroman pill	Combined oestrogen and progesterone pill
Frequency of use	Once a week	
Effect on FSH secretion	No effect	
Effect on ovulation	No effect	
Effect on rate of division in developing embryo	Increases	No effect
Effect on rate of development of uterine endometrium	Decreases	Decreases

2 (a) Complete the table. (3 marks)

2 (b) Use information from the table to suggest how centchroman acts as a contraceptive.

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(2 marks)

(Extra space)

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S 2 (c) There is a shortage of embryos available for implantation following *in vitro* fertilisation. A new technique that could be used to overcome this problem is to split developing embryos.

Women receiving *in vitro* fertilisation treatment often give birth to twins. The kind of twins born to a woman who undergoes the new treatment will be different from the kind of twins born to a woman who undergoes conventional *in vitro* fertilisation treatment.

Explain why the two kinds of twins will be different.

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(Extra space) (2 marks)

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7

Turn over for the next question

Turn over ►

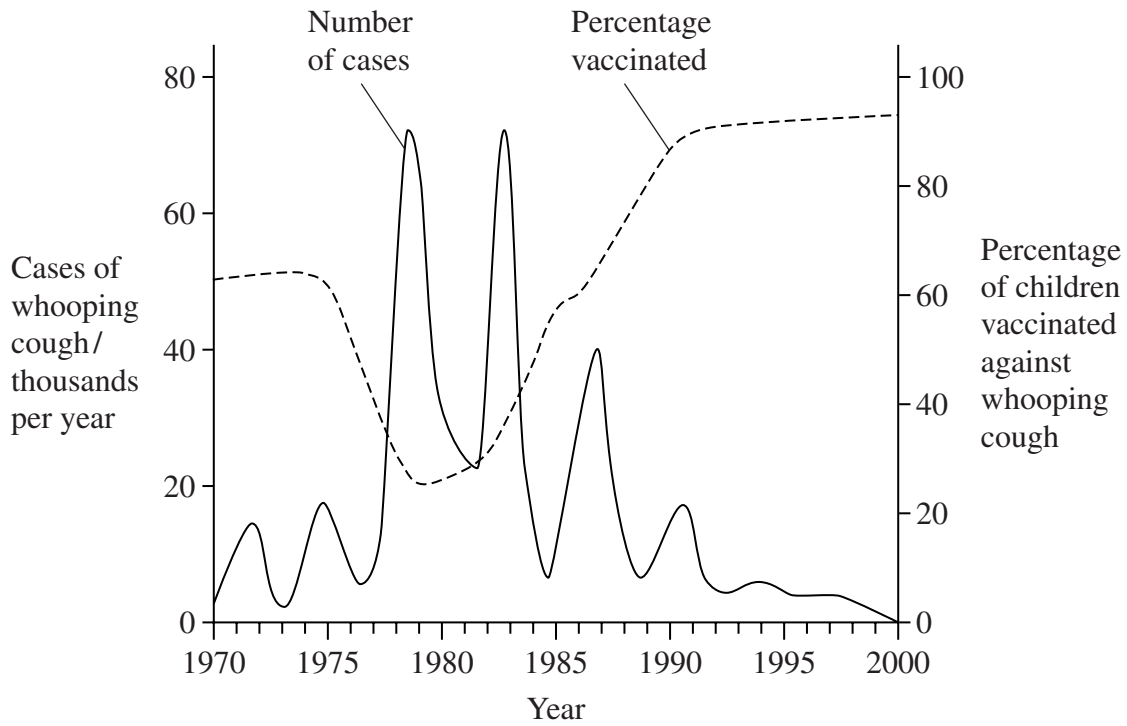


3 Whooping cough is a bacterial disease that affects the lungs. It is spread by droplet infection and is most common in young children.

3 (a) Explain what is meant by *droplet infection*.

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(1 mark)
(Extra space)
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The graph shows the number of cases of whooping cough in England and the percentage of children vaccinated against whooping cough between 1970 and 2000.



3 (b) The graph suggests that a decrease in the percentage of children vaccinated affects the number of cases of whooping cough. Describe and explain this effect.

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(3 marks)

(Extra space)

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3 (c) Babies less than 3 months old are too young to be vaccinated. The number of babies less than 3 months old with whooping cough was much lower in 2000 than in 1980. Use the graph to suggest why.

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(2 marks)

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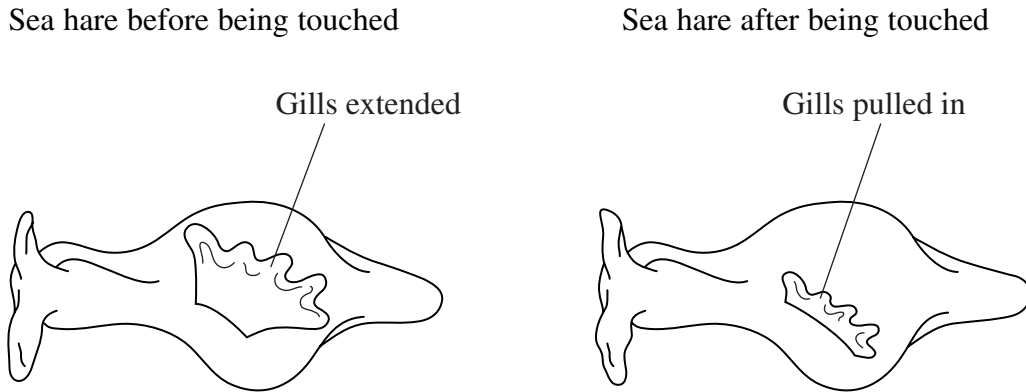
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4 The sea hare is an animal that lives in the sea. It has gills which extend from its body. When a sea hare is touched, it pulls its gills into a chamber within its body. **Figure 1** shows a sea hare before and after being touched.

Figure 1



When a sea hare is touched gently several times, it stops responding and no longer pulls its gills in.

4 (a) (i) What type of learned behaviour is the sea hare showing?

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(1 mark)

4 (a) (ii) Suggest **one** advantage to the sea hare of this type of learned behaviour.

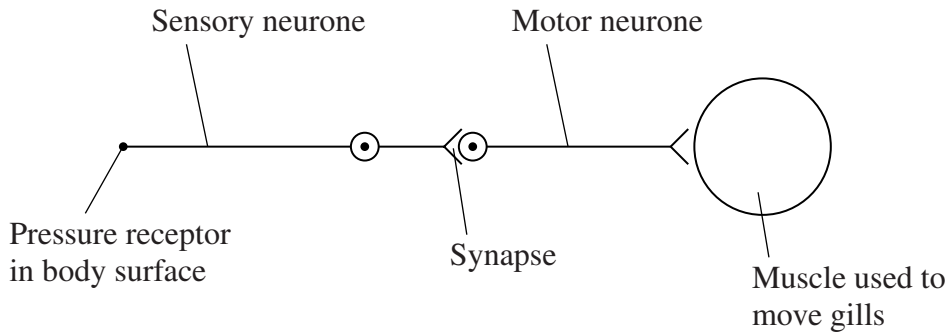
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S 4 (b) **Figure 2** shows the pathway involved when the gills are pulled in.

Figure 2



The reduced response to being touched gently several times may be caused by release of less neurotransmitter at the synapse. Suggest how less neurotransmitter could lead to the change in behaviour of the sea hare.

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(3 marks)

(Extra space)

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5

Turn over ►



5 (a) Basal metabolic rate (BMR) may be found by measuring a person's oxygen consumption at rest. In a population there is variation in the BMR.

5 (a) (i) After puberty, the average BMR of males is about 10 % higher than that of females. Describe **one** physical change in males during puberty which leads to a higher BMR.

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(1 mark)

(Extra space)
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S 5 (a) (ii) A tall person has a higher BMR than a short person with the same body mass. Suggest why.

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(2 marks)

(Extra space)
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5 (a) (iii) BMR decreases with old age. This is partly due to a decrease in concentration of some hormones. Name **one** hormone that is likely to have a significant effect on BMR.

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(1 mark)



S 5 (b) As a person gets older, the walls of the alveoli become less elastic. The walls of the alveoli also become thicker.

These changes make it harder for older people to carry out prolonged periods of exercise. Explain why.

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(3 marks)

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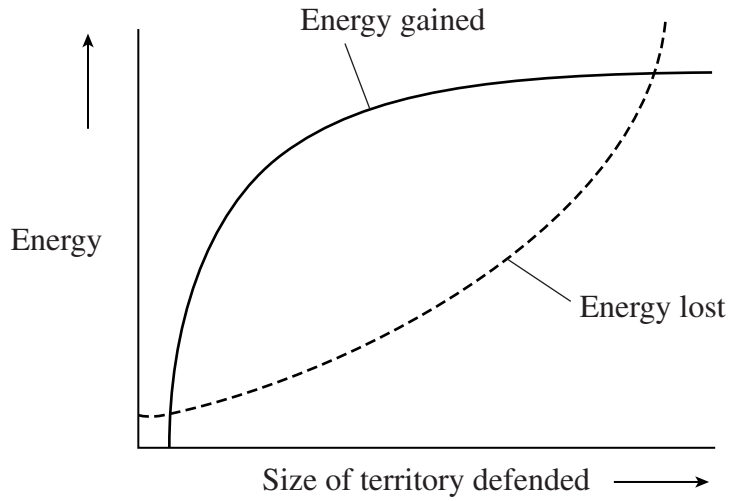
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Turn over for the next question

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6 Some animals defend a territory in which they live and feed. They gain energy from the food they eat. They lose energy in defending their territory. The graph shows the relationship between the size of territory defended and the amount of energy gained and lost.



6 (a) The energy gained levels off as the size of territory increases. Suggest why.

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(Extra space) (2 marks)

S 6 (b) Energy is lost in defending a territory. Explain how.

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(Extra space) (2 marks)



6 (c) Ecologists use graphs such as this to predict the maximum size and optimum size of an animal's territory. Use the graph to explain how ecologists could predict

6 (c) (i) the maximum size of a territory

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(1 mark)
(Extra space)

6 (c) (ii) the optimum size of a territory.

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(1 mark)
(Extra space)

6 (d) Other than supplying food, give **two** advantages to animals of having a territory.

1

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(2 marks)
(Extra space)

8

Turn over ►



7 Fertilisation begins with the binding of a sperm cell to protein receptors on the outer coating of the egg cell.

S 7 (a) Only sperm cells from an animal of the correct species bind to these receptors. Suggest why only these sperm cells are able to bind to the receptors.

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(2 marks)
(Extra space)

7 (b) (i) Explain how a sperm cell passes through the outer coating and enters the egg cell.

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(3 marks)
(Extra space)

7 (b) (ii) Explain how other sperm cells are prevented from entering the egg cell.

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(1 mark)
(Extra space)



S 7 (c) A sperm cell contains many mitochondria. These mitochondria produce ATP. Describe how ATP is produced in mitochondria.

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(Extra space) (4 marks)

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10

END OF SECTION A
SECTION B IS PROVIDED AS AN INSERT

Turn over ►



Use this page if you need extra answer space.

A series of horizontal dotted lines spanning the width of the page, providing space for handwritten answers.

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