



Biology

Standard Level

Paper 2 — Mock Examination

Mock Exam 3

Calculator required

Time allowed: **1 hour 30 minutes**

Maximum mark: **50 marks**

Candidate information

Candidate name:

Session number:

Date:

Topic emphasis: interaction and interdependence (immunity and disease, photosynthesis, neurons and synapses, the circulatory system), continuity and change (inheritance and sex linkage, classification and biodiversity) and form and function (blood vessels, the heart, hormones and homeostasis).

Instructions to candidates

- Write your session number in the box on the cover.
- Do not open this examination paper until you are told to do so.
- Section A: answer **all** questions.
- Section B: answer **one** question.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[50 marks]**.

The mark allocation is shown in square brackets at the end of each question or part question. Where a numerical answer is required, working must be shown; marks are available for a correct method even when the final answer is incorrect. Answers should be given to an appropriate number of significant figures and units must be included where relevant.

In Section B, **one additional mark** is available for the construction of your answer. This mark is awarded when your answer is clear enough to be understood without re-reading and is written succinctly, with little or no repetition or irrelevant material.

Mark allocation**Section A**

Question 1	[12 marks]
Question 2	[7 marks]
Question 3	[6 marks]
Question 4	[5 marks]
Question 5	[4 marks]

Section B

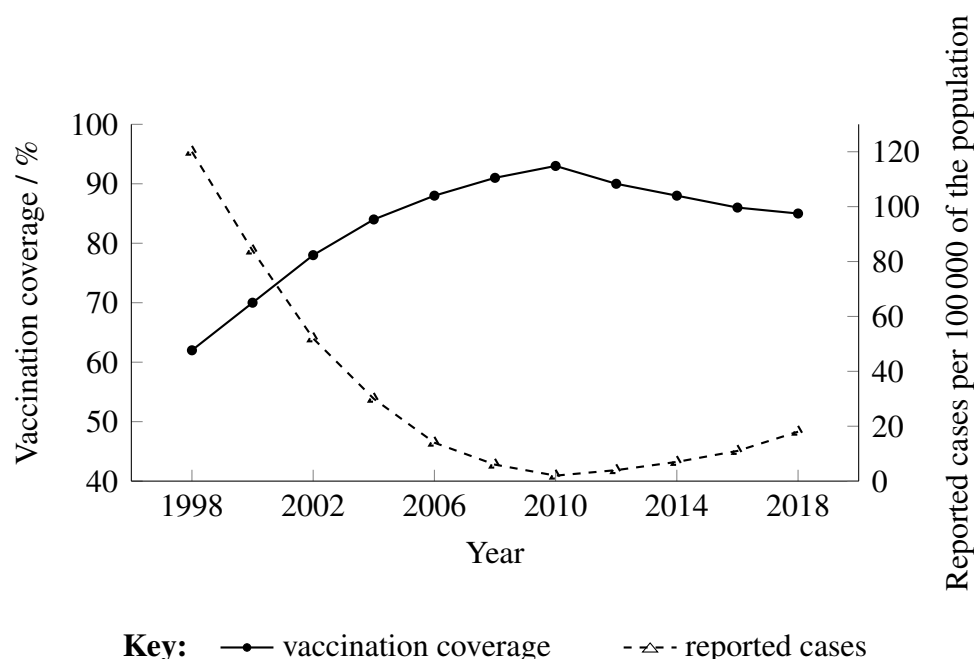
Question 6 or Question 7	[16 marks]
Total	[50 marks]

Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

1. Measles is caused by a virus that spreads in droplets from the respiratory tract of an infected person. A vaccine is available, but it is not given to infants until the age of twelve months.

Public health records for one country were analysed. The graph shows the percentage of two-year-old children who had received the vaccine and the number of cases of measles reported each year, for the period 1998 to 2018.



- (a) State the vaccination coverage in 2010.

[1]

.....

.....

- (b) Calculate the percentage decrease in reported cases between 1998 and 2010.
[2]

(This question continues on the following page)

(Question 1 continued)

- (c) Describe the relationship between vaccination coverage and the number of reported cases of measles. [2]

.....

.....

.....

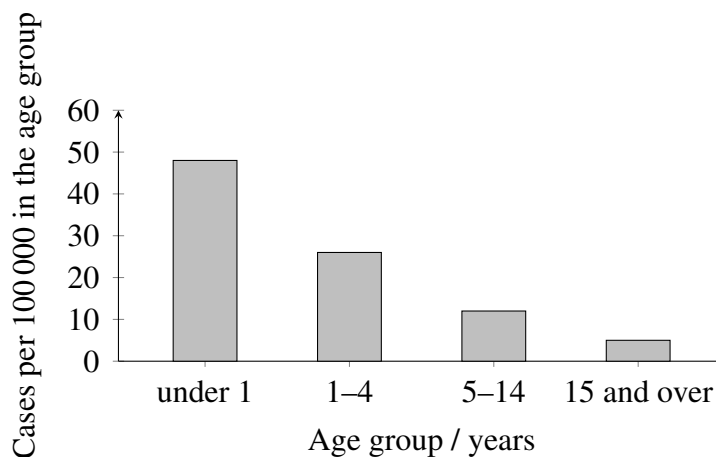
- (d) Suggest reasons for the change in the number of reported cases after 2010. [2]

.....

.....

.....

During the outbreak in 2018, the reported cases were classified by the age of the patient.



- (e) Explain why the number of cases per 100 000 was highest in children under one year of age. [2]

.....

.....

.....

(This question continues on the following page)

(Question 1 continued)

- (f) Discuss whether these data show that vaccination caused the fall in the number of cases of measles. [3]

.....

.....

.....

.....

.....

.....

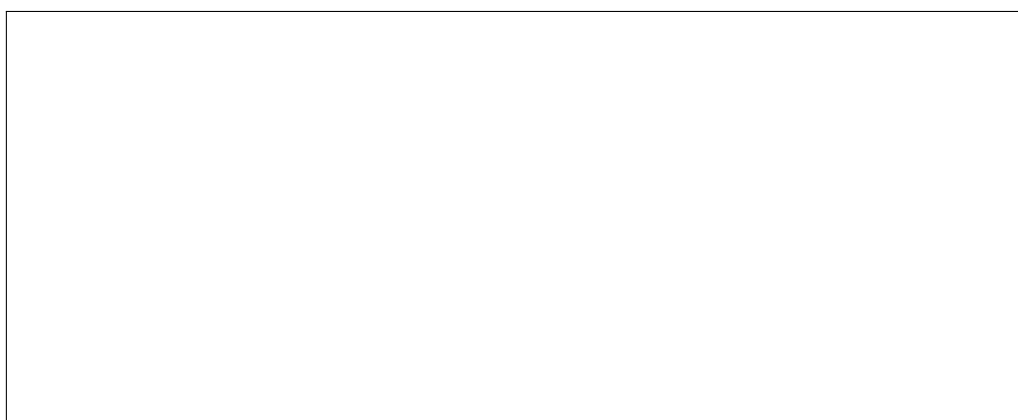
.....

2. Red–green colour blindness in humans is caused by a recessive allele carried on the X chromosome. The allele for normal colour vision is represented by X^B and the allele for colour blindness by X^b .

(a) State what is meant by a recessive allele. [1]

.....
.....

- (b) A woman with normal colour vision, whose father is colour blind, has children with a man who has normal colour vision. Determine, using a genetic diagram, the probability that a son of this couple will be colour blind. [4]



- (c) Explain why red–green colour blindness is much more common in males than in females. [2]

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

3. Photosynthesis converts light energy into the chemical energy of carbon compounds.

(a) Outline the role of chlorophyll in photosynthesis. [1]

.....
.....

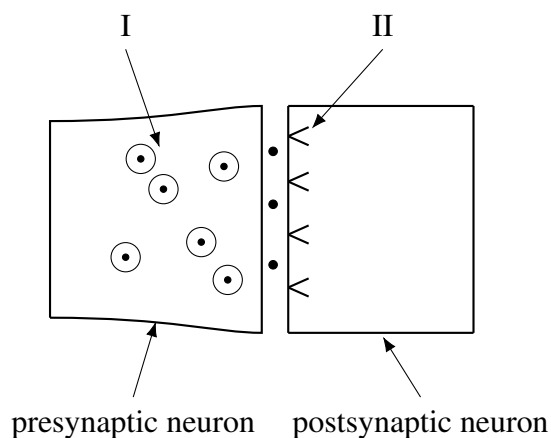
(b) Explain the effect of increasing light intensity on the rate of photosynthesis of a plant at a constant temperature and carbon dioxide concentration. [3]

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

(c) Describe how the rate of photosynthesis of an aquatic plant could be measured in a laboratory. [2]

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

4. The diagram shows a synapse between two neurons.



- (a) Identify the structures labelled I and II. [2]

.....

.....

.....

- (b) Outline how a nerve impulse is passed from the presynaptic neuron to the postsynaptic neuron. [3]

.....

.....

.....

.....

.....

.....

5. Biologists classify organisms and monitor the biodiversity of ecosystems.

(a) Outline the binomial system of naming species, using one named example.[2]

.....

.....

.....

.....

(b) Explain why classification based on evolutionary relationships is more useful to biologists than classification based on appearance alone. [2]

.....

.....

.....

.....

Section B

Answer **one** question. One additional mark is available for the construction of your answer. Answers must be written within the answer boxes provided.

6. The circulatory system carries materials to and from every tissue of the body.
- (a) Explain how the structure of arteries, capillaries and veins is related to their functions. [5]
 - (b) Describe the cardiac cycle, including how the beating of the heart is initiated and controlled. [7]
 - (c) Outline the causes and consequences of coronary heart disease. [3]
7. Hormones and nerve impulses both carry information between the parts of an animal's body.
- (a) Distinguish between control by hormones and control by nerve impulses. [4]
 - (b) Describe the roles of hormones in the human menstrual cycle. [7]
 - (c) Explain how the temperature of the human body is maintained by negative feedback. [4]

IB Demystified | www.ibdemystified.com **Turn over**

[illegible]

[illegible]

IB Demystified | www.ibdemystified.com **Turn over**

End of examination.

Total: 50 marks
