



MINISTRY OF EDUCATION, SINGAPORE  
 in collaboration with  
 CAMBRIDGE INTERNATIONAL EDUCATION  
 General Certificate of Education Advanced Level

CANDIDATE  
 NAME

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CENTRE  
 NUMBER

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INDEX  
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**BIOLOGY**

**9816/01**

Paper 1

**For examination from 2026**

SPECIMEN PAPER

**2 hours 30 minutes**

You must answer on the question paper.

You will need: Insert

**INSTRUCTIONS**

- Section A: answer **all** questions.
- Section B: answer **one** question.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and index number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use an approved calculator.

**INFORMATION**

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].
- The insert contains information

This document has **18** pages.



Singapore Examinations and Assessment Board



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## Section A

Answer **all** the questions in this section.

- 1 You should read through the whole of the insert and **Question 1** carefully and then use the information provided to answer the questions. The insert includes Table 1.1, Table 1.2, Figure 1.1 and Figure 1.2.

The entire question is based upon the cystic fibrosis transmembrane conductance regulator glycoprotein (CFTR), which is coded for by the *CFTR* gene. CFTR forms an ion channel.

- (a) (i) Using the data in Table 1.1 in the insert, complete Table 1.3 to show the probability that a child of African-American parents will be born with cystic fibrosis.

For this calculation, you should assume that no individuals with cystic fibrosis have children and that no new mutations occur.

**Table 1.3**

ethnic group	probability of child being born with cystic fibrosis
Ashkenazi Jews	1 in 2304
European / North American	1 in 2500
African–American	1 in .....
Asian	1 in 35 344

[1]

- (ii) Use the data in Table 1.3 to predict the expected percentage of people who are carriers for cystic fibrosis in the European / North American ethnic group.

**You should assume that the European / North American ethnic group represents a population that is in Hardy–Weinberg equilibrium.**

Give your answer to **three** significant figures.

Show your working.

expected percentage of carriers for cystic fibrosis = .....% [2]







(g) Use the information provided to make deductions about the possible structure and properties of the cell surface membrane receptor that binds to the cholera toxin.

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..... [3]

[Total: 25]



























