

Class	Register Number	Name
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南洋女子中学校
NANYANG GIRLS' HIGH SCHOOL

End-of-Year Examination 2019
Secondary Three

B

IP BIOLOGY
Paper 2 Theory Paper

Friday

Additional materials: Nil

11 October 2019

1 hour 45 minutes
1000 – 1145

READ THESE INSTRUCTIONS FIRST

Do not open this document until you are told to do so.

Write your name, register number and class in the spaces at the top of this page.

Section B

Answer **three** questions. Question **10** is in the form of an **Either/Or** question. Only **one** part should be answered.

Write your answers in the spaces provided on the question paper.

At the end of the examination,

1. fasten all your work securely together;
2. tick **10 Either** or **10 Or** in the grid-box to indicate the question answered.

You are advised to spend no longer than 1 hour on **Section A**, and no longer than 45 minutes on **Section B**. The intended number of marks is given in the brackets [] at the end of each question or part question.

The use of an approved scientific calculator is expected, where appropriate.

Section B

Answer **three** questions.

Question **10** is in the form of an **Either/Or** question. Only **one** part should be answered.

Write your answers in the spaces provided on the question paper.

- 8 (a)** Describe the structure of DNA.

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..... [4]

- (b) (i)** Using the “lock and key” hypothesis, explain the digestion of starch by amylase.

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- (ii) While doing spring cleaning in a laboratory, a student found a glass bottle labelled as amylase in the refrigerator.

Briefly describe an experiment he can carry out to confirm that bottle contained the enzyme, amylase.

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[3]

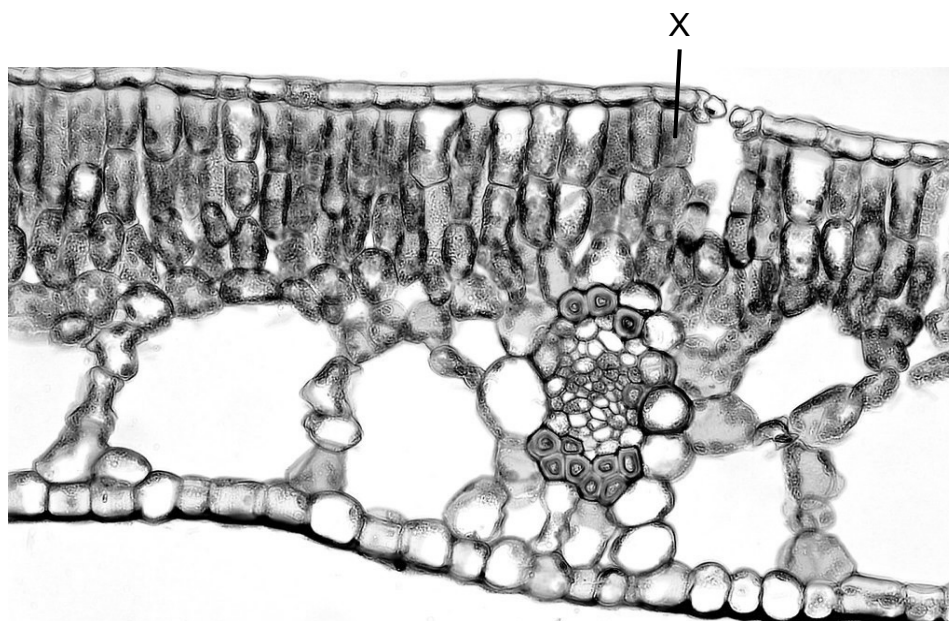
[total: 10]

- 9 Fig. 9.1 shows the plant, *Potamogeton natans* in its habitat.
Fig. 9.2 shows a photomicrograph of a section through the leaf of the plant.



<https://www.first-nature.com/flowers/potamogeton-natans.php>

Fig. 9.1



<https://hiveminer.com/Tags/leaf%2Cstomata>

Fig. 9.2

- (a) Identify the cell labelled X and state its adaptation for its function.

identity of cell X:

adaptation:

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[2]

- (b)** Using Fig. 9.1 and Fig. 9.2, explain two ways in which the leaf is well adapted for its function in its habitat.

1.

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2.

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[2]

Fig. 9.3 below shows the volume of oxygen released by *Potamogeton natans*.

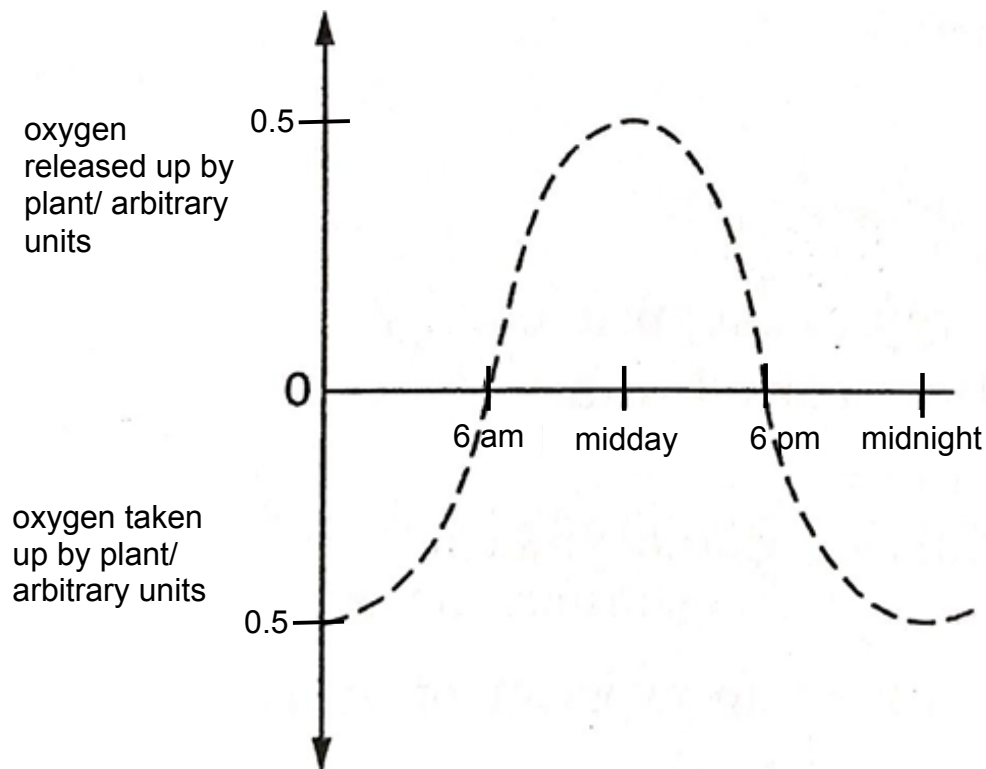


Fig. 9.3

(c) Explain why there is no net oxygen produced at 6 am.

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[2]

(d) Explain the shape of the graph from 6 am to midday.

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[3]

- (e) The volume of oxygen used by a plant remains relatively constant throughout the day. However, the volume of oxygen released by the plant varies throughout the day as shown in Fig. 9.3.

Explain why.

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..... [1]

[total: 10]

Question **10** is in the form of an **Either/Or** question. Only **one** part should be answered.

10 Either

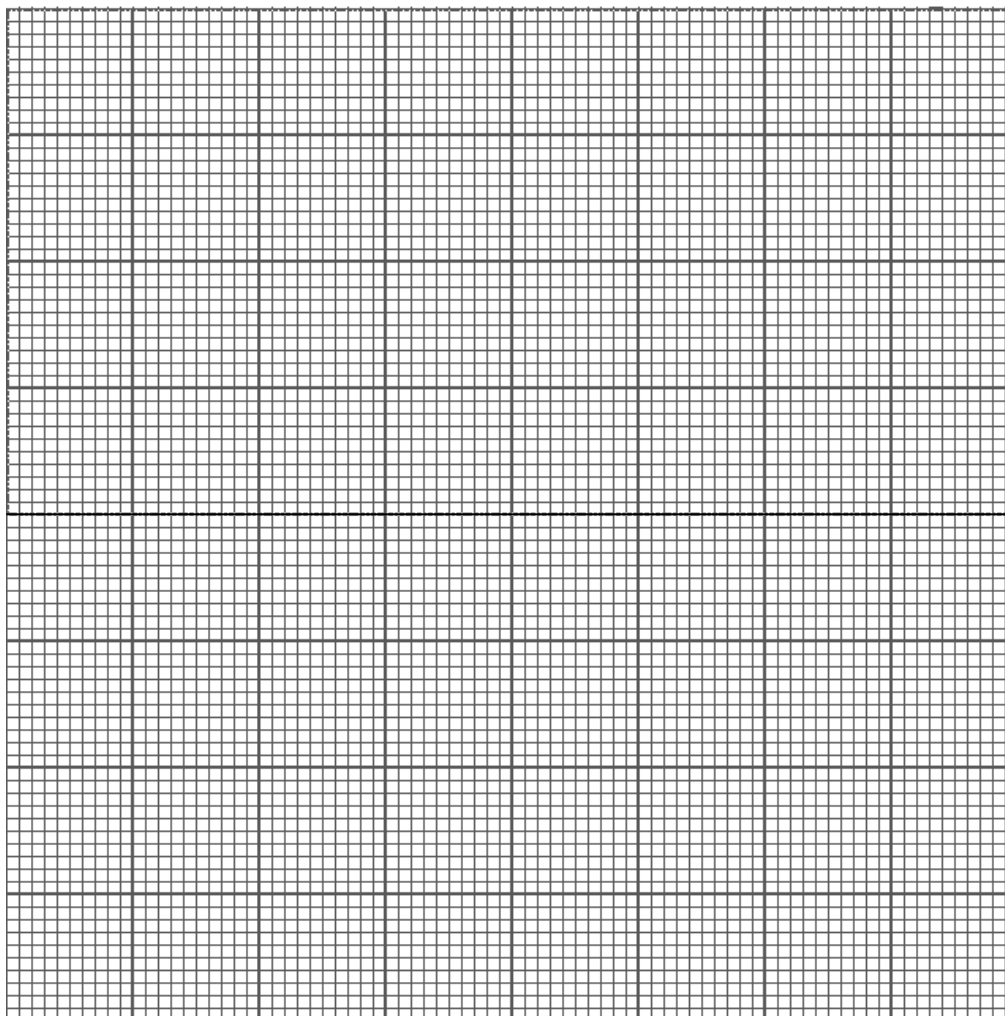
Cheryl conducted an experiment to measure the transpiration rates of two different species of plants, A and B. Using a potometer, she measured the volume of water lost by the plants at 5 minute intervals, for a total of 15 minutes.

Cheryl's data is recorded in Table 10.1.

Table 10.1

plant species	volume of water lost by plant at x minute / cm ³			
	0 min	5 min	10 min	15 min
A	0.0	1.0	2.6	3.6
B	0.0	0.6	1.2	1.8

- (a) (i) Draw a graph to represent the results.



[5]

- (ii) Use your graph to calculate the transpiration rate of plant species B. Show your working clearly. Give your answer to 2 significant figures.

[3]

- (b) Cheryl lives in a small town near the Simpson Desert. The climate is very hot and dry. She is thinking of growing plants in her backyard.

Evaluate, with reasons, which species, A or B, would be suitable for growing in Cheryl's backyard.

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[2]

[total: 10]

10 Or

- (a) A 10-year coronary heart disease risk is an indication of how likely a person would develop heart disease in the next 10 years. Individuals with a score of less than 10% are considered to be at low risk, 10 – 20% at moderate risk, and above 20% at high risk.

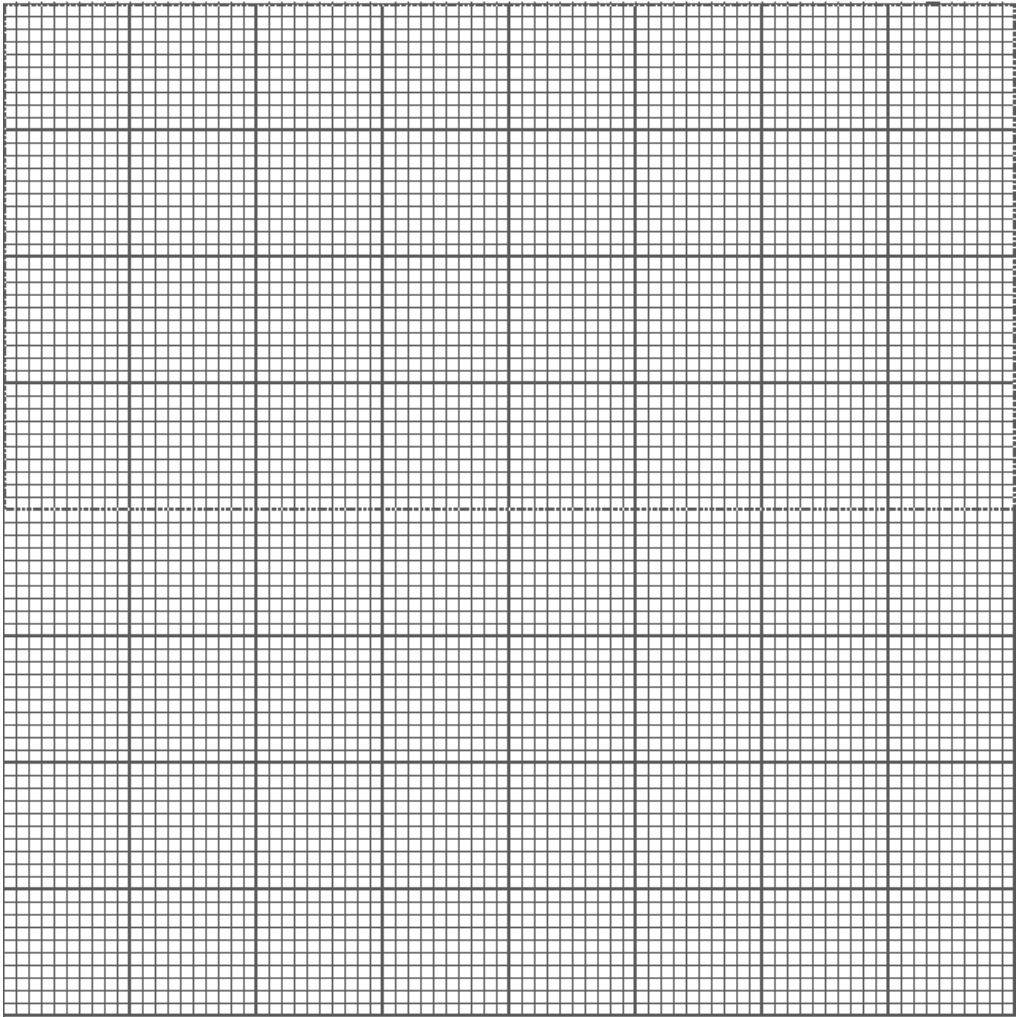
Table 10.2 shows the estimated 10-year coronary heart disease risk, by gender, in adults 55 years of age. The adults fall into four general categories, A, B, C and D.

[source: https://www.heart.org/idc/groups/heart-public/@wcm/@sop/@smd/documents/downloadable/ucm_449846.pdf]

Table 10.2

category	10-year coronary heart disease risk by gender /%	
	male	female
A	5	5
B	13	8
C	25	20
D	37	27

Using the information in Table 10.2, draw a bar chart showing a clear comparison between males and females within each category.



[5]

- (b) The details of categories A, B, C and D are shown in Table 10.3.

Table 10.3

category	blood pressure/ mmHg	cholesterol/ mg per dL	diabetes	cigarette smoking
A	120/80	200	no	no
B	140/90	240	no	no
C	140/90	240	yes	no
D	140/90	240	yes	yes

[adapted from: <https://www.heart.org>]

Using Tables 10.2, 10.3 and your graph in (a), describe the trends of the data.

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..... [3]

- (c) Mr G is a 55-year-old man with type II diabetes. He smokes an average of 20 cigarettes a day, is obese, and has a diet of fried food, deep fried food and pizza.

Using Tables 10.2 and 10.3, suggest and explain two actions that Mr G could take to decrease his risk of developing coronary heart disease in the next 10 years.

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..... [2]

[total: 10]

END OF PAPER