

2022-2023
MOCK EXAM
S6 Bio
Paper 2

SACRED HEART CANOSSIAN COLLEGE
2022-2023 MOCK EXAMINATION

Secondary 6
BIOLOGY
Paper 2

Time allowed: 1 hour

This paper must be answered in English

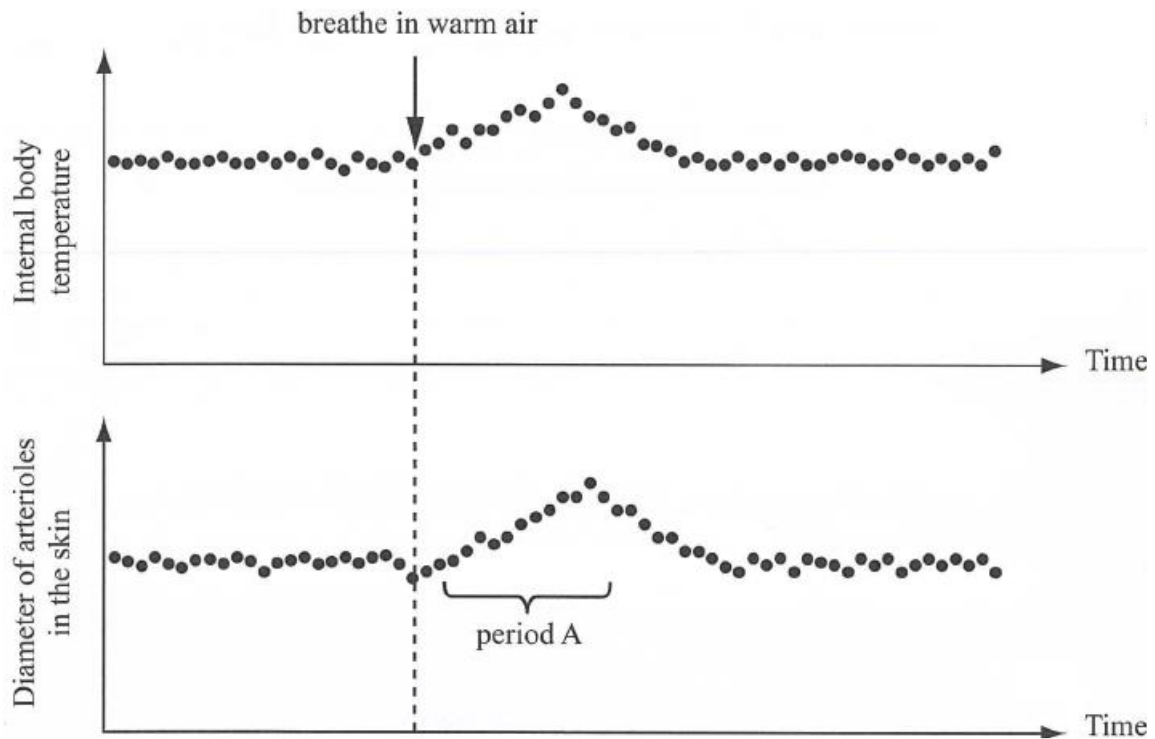
INSTRUCTIONS

- (1) The full mark of this paper 40.
- (2) There are **TWO** sections, A and B, in this paper. (Sections C and D are not provided.) Attempt **ALL** questions in the two sections.
- (3) Write your answers in the Answer Book provided. Start each question (not part of a question) on a new page.
- (4) Write your name, class and class number on the Answer Book provided.
- (5) Present your answers in paragraphs wherever appropriate.
- (6) Illustrate your answers with diagrams wherever appropriate.
- (7) The diagrams in this Paper are **NOT** necessarily drawn to scale.

SECTION A Human Physiology: Regulation and Control

Answer **ALL** parts of the question.

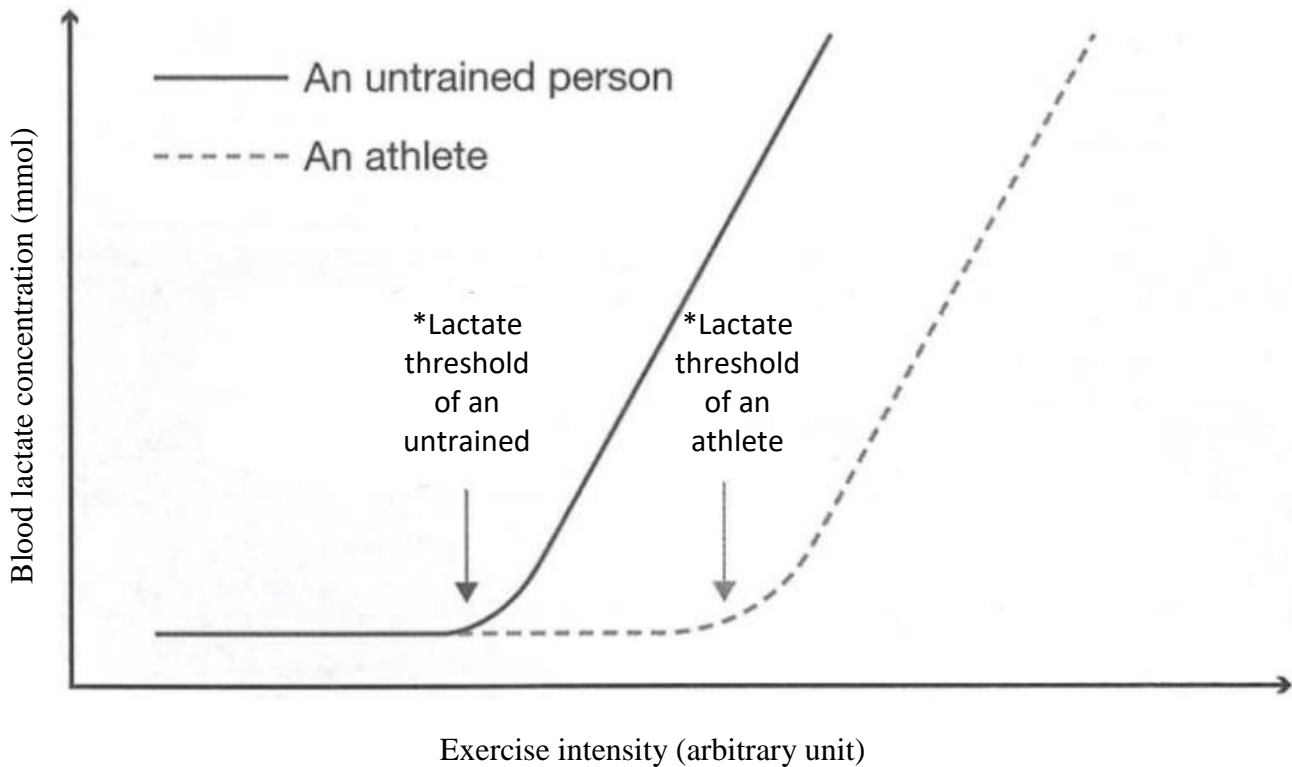
1. (a) In an experiment, a healthy man was asked to breathe in warm air of 45 °C for 20 times. The following graphs show the changes in his internal body temperature and the diameter of arterioles near the skin surface:



- (i) Explain the nervous coordination that brings about the change in the diameter of arterioles in the skin during period A. (3 marks)
- (ii) What is the significance of the increase in the diameter of arterioles near the skin surface during the experiment? (3 marks)
- (iii) Having a very hot water bath for a long time on a very cold day may cause fainting. What is the physiological basis for this? (4 marks)

1. (b) The graph below shows the results of an experiment about the relationship between the blood lactate (lactic acid) concentration and the exercise intensity of an athlete and an untrained person:

Blood lactate concentration with increasing exercise intensity in an athlete and untrained person



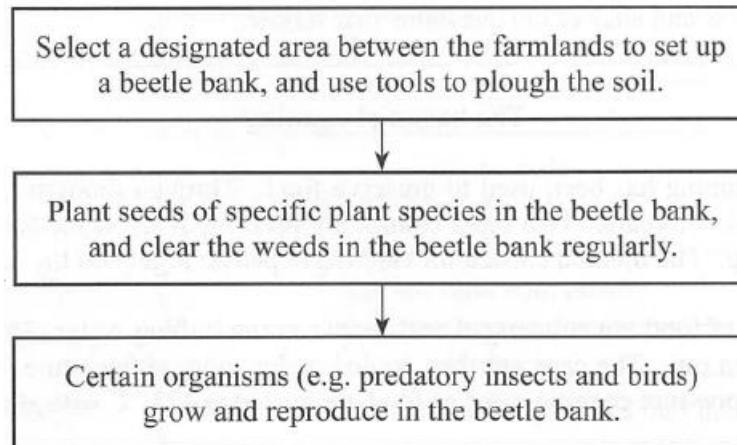
**Lactate threshold: point of sudden increase in blood lactate concentration*

- (i) Account for the increase in blood lactate concentration for both the athlete and the untrained person when there is an increase in the exercise intensity. (3 marks)
- (ii) One hypothesis to explain why an athlete will have a higher lactate threshold than an untrained person is because there is a change in the number of an organelle in the muscle cells. Suggest what this change can be and briefly explain how it can lead to the difference in their lactate thresholds. (2 marks)
- (iii) Briefly describe the experiment and explain how the necessary data can be collected under a fair condition to construct the relationship in the above graph. (3 marks)
- (iv) Athletes are often equipped with better ability to remove muscular lactate. Describe the physiological difference of the heart between athletes and untrained people and explain how it leads to such a difference in their abilities. (2 marks)

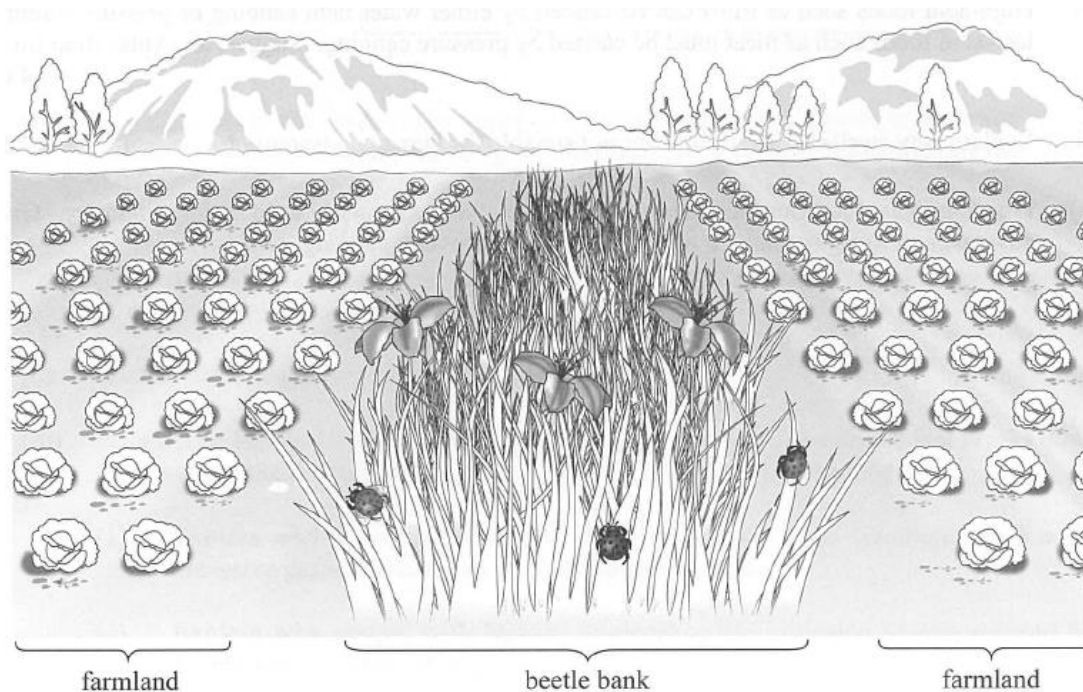
SECTION B Applied Ecology

Answer **ALL** parts of the question.

2. (a) The beetle bank is a biological control method that helps control the number of pests (e.g. aphids) on the farmlands. The flowchart below shows part of the processes of setting up a beetle bank.



Below is a simplified diagram of a beetle bank:



2. (a) (i) Before sowing the seeds, farmers plough the soil. Explain why ploughing the soil can promote the growth of seedlings. (2 marks)
- (ii) With reference to the above information, explain how the beetle bank improves agricultural production based on the principle of biological control. (3 marks)
- (iii) Using chemical pesticides is a more convenient way to control the number of pests. However, many farmers still use the method of beetle bank. Compared with using chemical pesticides, state *two* advantages of setting up beetle banks. (2 marks)
- (iv) During the first few years of setting up the beetle bank, farmers need to clear the weeds in the beetle bank regularly. After that, the frequency of clearing weeds may decrease. With reference to the interactions between the weeds and the plants in the beetle bank, explain the significance of this agricultural practice. (4 marks)
- (b) Since 31st December 2012, a ban on trawling has been implemented in Hong Kong waters to protect the marine ecosystem. Some of the affected fishermen have then switched to other fisheries operations such as aquaculture.
- (i) Explain the potential benefits of the trawling ban to the local marine ecosystem. (2 marks)
- (ii) Aquaculture involves raising fish in fish farms. The fish are kept in cages in the water and fed with pellets made from small fish. Suggest why farmed fish are able to grow faster than wild fish of the same species. (3 marks)
- (iii) Aquaculture can also harm the surrounding environment. Discuss the harmful effects of the release of organic wastes from the fish farm on the local marine communities. (4 marks)

END OF PAPER

