

19 What is produced by anaerobic respiration in human muscles?

|          | carbon dioxide | lactic acid | water |
|----------|----------------|-------------|-------|
| <b>A</b> | ✓              | ✓           | ✗     |
| <b>B</b> | ✓              | ✗           | ✓     |
| <b>C</b> | ✗              | ✓           | ✗     |
| <b>D</b> | ✗              | ✗           | ✓     |

key

✓ = substance is produced

✗ = substance is **not** produced

17 A person exercised vigorously for one minute and then rested for one hour.

Which statements about lactic acid are correct?

- 1 During exercise, lactic acid is produced in the muscles and diffuses into the blood.
- 2 The blood transports lactic acid to the liver.
- 3 Lactic acid is broken down by anaerobic respiration.

**A** 1, 2 and 3    **B** 1 and 2 only    **C** 2 and 3 only    **D** 2 only

6 (a) An athlete monitored their heart rate and breathing rate before, during and after vigorous exercise.

Fig. 6.1 shows the results.

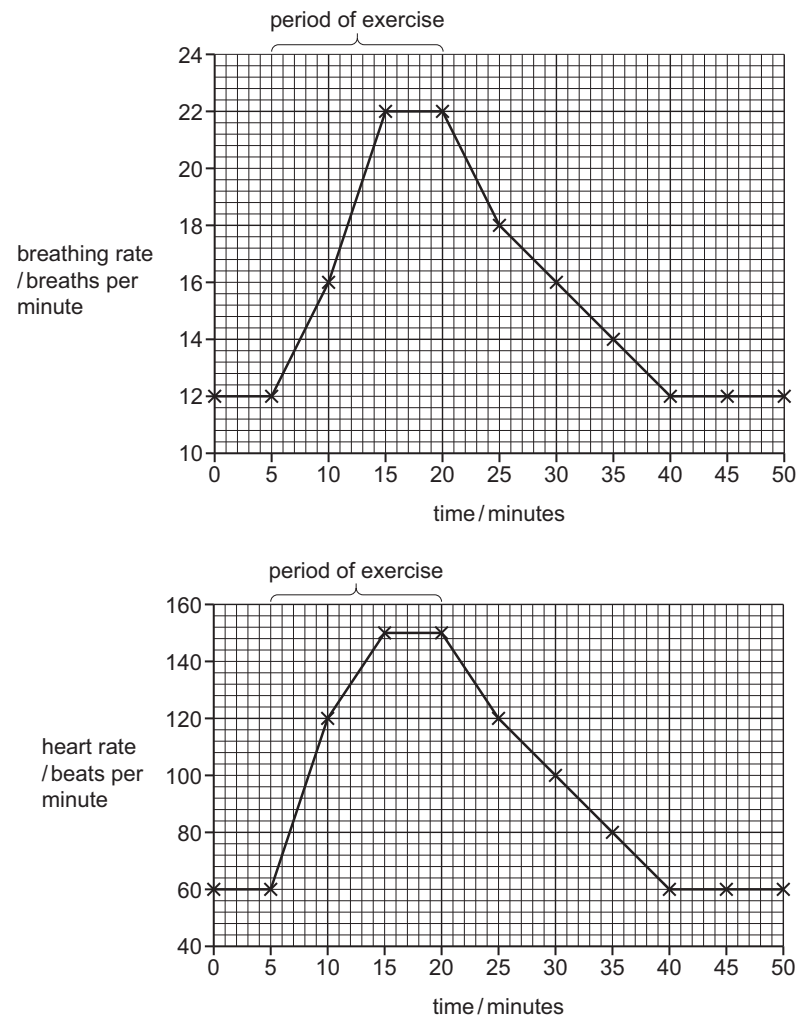


Fig. 6.1

Complete the sentences to describe **and** explain the results shown in Fig. 6.1.

After exercise, it takes ..... minutes for the athlete's breathing rate to return to its resting rate.

The heart rate decreases by ..... beats per minute between 20 and 40 minutes.

The heart rate and breathing rate do not immediately return to their resting rates because anaerobic respiration has occurred.

Lactic acid has built up in ..... causing an oxygen .....

The heart rate remains high to transport lactic acid to the .....

The breathing rate remains high to supply ..... for the ..... respiration of lactic acid.

[7]

(b) The carbon dioxide produced during exercise is excreted. Urea is another substance that is excreted.

(i) State the name of the organ that produces urea.

..... [1]

(ii) State the name of the organ that excretes urea.

..... [1]

(c) State the balanced chemical equation for anaerobic respiration in yeast.

..... [2]

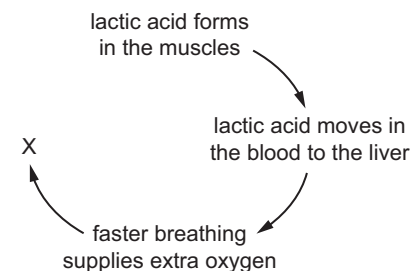
(d) State **one** food product that is made using anaerobic respiration in yeast.

..... [1]

[Total: 12]

**22** After a race, athletes experience oxygen debt.

The diagram shows how the oxygen debt is removed.



What happens at X?

- A** aerobic respiration of glucose
- B** aerobic respiration of lactic acid
- C** anaerobic respiration of glucose
- D** anaerobic respiration of lactic acid

**20** Which sequence of statements explains the build-up and removal of an oxygen debt?

- 1 Anaerobic respiration occurs in muscles during vigorous exercise.
- 2 Faster and deeper breathing continues after exercise.
- 3 Glucose is converted to lactic acid.
- 4 Lactic acid builds up in muscles causing an oxygen debt.
- 5 Oxygen enables the continued aerobic respiration of lactic acid.

- A** 1 → 3 → 4 → 2 → 5
- B** 1 → 3 → 2 → 4 → 5
- C** 3 → 4 → 5 → 1 → 2
- D** 3 → 4 → 1 → 5 → 2

**19** Yeast can respire aerobically and anaerobically.

For each molecule of glucose used in yeast, how many more molecules of carbon dioxide gas are produced by aerobic respiration compared with anaerobic respiration?

- A** 1 more
- B** 2 more
- C** 4 more
- D** 6 more