1.9 Aerobic and Anaerobic Exercise: Definitions and Sporting Examples: 10-minute Pack

AQA 8582 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State one factor that determines whether a sporting action is aerobic or anaerobic, using the example of a 10 km run compared with a 100 m sprint.

(Total for Question 1 is 1 mark)

2 Define anaerobic exercise as used in AQA GCSE PE, naming the key features of intensity and duration in a sporting context such as a 100 m sprint or a heavy lift.

(Total for Question 2 is 1 mark)

3 A cyclist completes a single explosive sprint for the finish line, lasting around 12 seconds, at the end of a much longer road race. State whether this final sprint alone should be classed as aerobic or anaerobic exercise.

(Total for Question 3 is 1 mark)

4 Tick the box that best describes a typical duration for activities usually classed as anaerobic in sport, giving the context of short track events or single maximal efforts.

- ☐ A) More than 20 minutes
- ☐ B) 3 to 10 minutes
- ☐ C) Less than about 2 minutes, often under 30 seconds for maximal efforts
- ☐ D) Continuous all-day activity

(Total for Question 4 is 1 mark)

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5 A shot putt is a single effort lasting less than 2 seconds. Explain in two sentences why this action is anaerobic and name the sporting example.

(Total for Question 5 is 2 marks)

6 Analyse the differences in aerobic and anaerobic demands between a 5 km road race completed in around 20 to 25 minutes and a 100 m sprint. Use named sporting actions from each example and make a judgement about which system is dominant in each event.

(Total for Question 6 is 6 marks)

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Mark scheme · 1.9 Aerobic and Anaerobic Exercise: Definitions and Sporting Examples: 10-minute Pack

Question 1

intensity (how hard the performer is working) **B1**

Answer: Intensity

Question 2

high intensity, short duration activity where oxygen supply does not meet demand, oe **B1**

Answer: High intensity, short duration activity where oxygen supply does not meet demand.

Question 3

anaerobic, oe (a short, maximal-intensity effort) **B1**

Answer: Anaerobic, as it is a short, maximal-intensity effort.

Question 4

C **B1**

Answer: C

Question 5

it is very high intensity and extremely short duration so oxygen cannot be supplied quickly enough, oe **B1**

example named: shot putt (single explosive throw), oe **B1**

Answer: This action is anaerobic because it is very high intensity and extremely short in duration, so oxygen cannot be supplied quickly enough. Example: shot putt, a single explosive throw.

Question 6

Level 2 A clear, specific analysis that compares at least three relevant differences in intensity, duration and oxygen supply between the 5 km race and the 100 m sprint, uses named sporting actions (for example sustained steady pace in the 5 km and an explosive start and maximal sprint in the 100 m), and reaches a supported judgement on which system is dominant in each event. **4-6**

Level 1 A simple comparison that makes one or two relevant points about intensity or duration with some reference to the sporting examples, and gives a basic judgement on dominance of aerobic or anaerobic without full development. **1-3**

Level 0 No relevant content. **0**

Indicative content:

- 5 km race: duration approximately 20 to 25 minutes, so sustained energy over many minutes favors aerobic supply as dominant.
- 5 km race: intensity is moderate to high but submaximal, oxygen can be supplied to meet much of the demand during steady-state sections, enabling aerobic metabolism to dominate.
- 5 km race action example: repeated steady pace and tactical surges, with aerobic system supporting endurance and repeated efforts over the whole distance.
- 100 m sprint: duration under 15 seconds with maximal intensity, oxygen cannot be supplied quickly enough, so anaerobic processes are dominant.
- 100 m sprint action example: explosive block start, rapid acceleration and maximal velocity using short-term high intensity power, which relies on anaerobic energy.
- Comparison: 5 km requires efficient oxygen delivery and sustained cardiac output, while 100 m requires immediate high power output and phosphagen/anaerobic sources, so the physiological demands differ in time course and fuel use.
- Judgement guidance: conclude 5 km is predominantly aerobic with possible brief anaerobic bursts near the finish, and 100 m is predominantly anaerobic with negligible aerobic contribution to peak speed, supporting a clear dominance statement for each event.

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