1.9 Aerobic and Anaerobic Exercise: Definitions and Sporting Examples: Test Pack

AQA 8582 · Calculators not allowed · about 15 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Which of the following best describes aerobic exercise in the context of sport and training, for example a steady 10 km run?

- [ ] A) Very high intensity, short duration activity where oxygen supply cannot meet demand
- [ ] B) Moderate to low intensity, sustained activity where oxygen supply meets energy demand
- [ ] C) Any activity performed while holding the breath
- [ ] D) Activity that only uses the arms and shoulders

(Total for Question 1 is 1 mark)

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2 Tick one box to identify which of these sporting actions is best classified as anaerobic exercise, based on its typical duration and intensity.

- [ ] A) A track athlete completing a 60 m indoor sprint in around 7 seconds
- [ ] B) A marathon runner racing at a steady pace for around 3 hours
- [ ] C) A cyclist completing a 10 km time trial in around 15 minutes
- [ ] D) A rower completing a head race over 5 km in around 20 minutes

(Total for Question 2 is 1 mark)

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3 State whether a squash player's overall energy demand across a 45 minute match is mostly aerobic or mostly anaerobic, given a match is made up of many short, fast rallies separated by brief pauses, and give a reason for your answer.

(Total for Question 3 is 2 marks)

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4 State one factor, other than the overall length of the activity, that would make a 3 minute activity more likely to be classed as anaerobic rather than aerobic.

(Total for Question 4 is 1 mark)

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5 A netball centre covers the court with a mixture of short sprints to intercept the ball and periods of jogging or standing between phases of play, across a match lasting around 60 minutes. Explain why classifying this player's whole match as simply 'aerobic' or simply 'anaerobic' would be an oversimplification.

(Total for Question 5 is 3 marks)

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6 Describe how the energy demand of a cricket fast bowler changes between the few seconds of their bowling run-up and delivery, and the longer periods spent fielding or waiting between overs.

(Total for Question 6 is 2 marks)

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7 Table 1 shows the approximate duration of four sporting actions.

Table 1

Sporting action	Approximate duration
A tennis serve and the point that follows it	8 seconds
A single judo throw during a contest	3 seconds
A 1500 m freestyle swim	16 minutes
A continuous 5-a-side football match	40 minutes

(a) Using Table 1, identify which TWO of the four sporting actions would usually be classified mainly as anaerobic exercise. **(2)**

(b) Using Table 1, explain why the 5-a-side football match is not as straightforward to classify as the judo throw. **(2)**

(Total for Question 7 is 4 marks)

8 A weightlifter performs a set of three maximal lifts, each lasting a few seconds with long rests between. Name whether this set is anaerobic or aerobic and give one reason.

(Total for Question 8 is 2 marks)

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Mark scheme · 1.9 Aerobic and Anaerobic Exercise: Definitions and Sporting Examples: Test Pack

Question 1

B **B1**

Answer: B

Question 2

A **B1**

Answer: A (the 60 m indoor sprint)

Question 3

mostly aerobic overall **B1**

because the total match duration is long (up to 45 minutes), so the aerobic system supplies most of the sustained energy needed, even though individual rallies are fast and intense, oe **B1**

Answer: Mostly aerobic overall, because the total match duration is long, so the aerobic system supplies most of the sustained energy needed across the whole match, even though individual rallies are fast and intense.

Question 4

high intensity/near-maximal effort, oe **B1**

Answer: A high, near-maximal intensity throughout the activity.

Question 5

the match contains short, high-intensity bursts of activity (sprinting to intercept), which individually match the anaerobic definition, oe **B1**

it also contains long periods of lower-intensity movement (jogging/standing), which match the aerobic definition, oe **B1**

so the player's energy demand switches between the two systems throughout the match rather than staying fixed as one type, meaning a single label does not capture what actually happens, oe **B1**

Answer: The match contains short, high-intensity bursts (sprinting to intercept) that individually match the anaerobic definition, and also long periods of lower-intensity movement (jogging or standing) that match the aerobic definition, so the player's energy demand switches between the two systems throughout rather than staying fixed as one type.

Question 6

the run-up and delivery is short and near-maximal in intensity, so it is anaerobic, oe **B1**

the periods of fielding/waiting between overs are much lower in intensity and can be sustained for longer, so they are aerobic (or largely at rest), oe **B1**

Answer: The run-up and delivery is short and near-maximal in intensity, so it is anaerobic, while the periods of fielding or waiting between overs are much lower in intensity and can be sustained for longer, so they are aerobic or largely at rest.

Question 7

(a) the tennis serve and point, oe **B1**

(a) the judo throw, oe **B1**

(a) Answer: The tennis serve and the point that follows it, and the judo throw.

(b) the judo throw is a single, short, maximal action, so it is clearly anaerobic, oe **B1**

(b) the football match lasts 40 minutes overall but includes both short sprints and slower periods, so it involves a mix of both energy systems rather than one single, clear classification, oe **B1**

(b) Answer: The judo throw is a single, short, maximal action, so it is clearly anaerobic. The football match lasts 40 minutes overall but includes both short sprints and slower periods of play, so it involves a mix of both energy systems rather than one single, clear classification.

Question 8

anaerobic **B1**

high intensity and very short duration for each lift, so oxygen supply cannot meet immediate demand, oe **B1**

Answer: Anaerobic, because each maximal lift is high intensity and very short in duration, so oxygen supply cannot meet immediate demand.

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