1.4 Cardio-Respiratory System: Breathing and Gaseous Exchange: 10-minute Pack

AQA 8582 · Calculators not allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Air travels through several structures on its way from the mouth/nose to the lungs. Which of the following gives the structures in the correct order?

- ☐ A) Trachea, bronchi, bronchioles, alveoli
- ☐ B) Bronchi, trachea, bronchioles, alveoli
- ☐ C) Alveoli, bronchioles, bronchi, trachea
- ☐ D) Trachea, bronchioles, bronchi, alveoli

(Total for Question 1 is 1 mark)

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2 State the term used for the smaller tubes that the bronchi branch into within the lungs, before reaching the alveoli.

(Total for Question 2 is 1 mark)

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3 A swimmer performs an interval training session, breathing much more deeply and rapidly than at rest.

(a) State the term used for the volume of air breathed in or out in one breath. **(1)**

(b) Explain why an increase in both tidal volume and breathing rate during exercise increases the amount of oxygen available to the working muscles. **(2)**

(Total for Question 3 is 3 marks)

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4 Table 1 gives descriptions of structures and terms in the respiratory system, with the name missing.

Table 1

Part	Description
(a)	The tube that carries air from the throat down towards the two bronchi
(b)	The dome-shaped muscle beneath the lungs that contracts and flattens during inspiration
(c)	The maximum volume of air that can be forcibly breathed out after the deepest possible breath in
(d)	The number of breaths taken in one minute
(e)	The muscles between the ribs that contract during inspiration to pull the ribcage up and out

(a) Name the structure/term described in row (a) of Table 1. **(1)**

(b) Name the structure/term described in row (b) of Table 1. **(1)**

(c) Name the structure/term described in row (c) of Table 1. **(1)**

(d) Name the structure/term described in row (d) of Table 1. **(1)**

(e) Name the structure/term described in row (e) of Table 1. **(1)**

(Total for Question 4 is 5 marks)

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5 A distance runner completes a 12-week aerobic training block. Explain how long-term aerobic training can increase vital capacity, and how this benefits the runner's performance.

(Total for Question 5 is 3 marks)

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Mark scheme · 1.4 Cardio-Respiratory System: Breathing and Gaseous Exchange: 10-minute Pack

Question 1

A **B1**

Answer: A (trachea, bronchi, bronchioles, alveoli)

Question 2

bronchioles **B1**

Answer: Bronchioles

Question 3

(a) tidal volume **B1**

(a) Answer: Tidal volume

(b) a greater tidal volume means more air (and so more oxygen) enters the lungs with each breath, oe **B1**

(b) a faster breathing rate means this larger volume of air is breathed in more often per minute, so overall more oxygen reaches the alveoli (and diffuses into the blood) each minute, oe **B1**

(b) Answer: A greater tidal volume means more air (and oxygen) enters the lungs with each breath, and a faster breathing rate means this happens more often per minute, so overall more oxygen reaches the alveoli and diffuses into the blood each minute.

Question 4

(a) trachea **B1**

(a) Answer: Trachea

(b) diaphragm **B1**

(b) Answer: Diaphragm

(c) vital capacity **B1**

(c) Answer: Vital capacity

(d) breathing rate (respiratory rate) **B1**

(d) Answer: Breathing rate

(e) external intercostal muscles **B1**

(e) Answer: External intercostal muscles

Question 5

long-term aerobic training strengthens the respiratory muscles (the diaphragm and intercostal muscles), oe **B1**

this can increase the depth of each breath the runner is able to take, increasing their vital capacity, oe **B1**

a greater vital capacity allows more oxygen to be taken in with each breath, which can be delivered to the working muscles, delaying fatigue and improving endurance performance, oe **B1**

Answer: Long-term aerobic training strengthens the respiratory muscles (the diaphragm and intercostal muscles), which can increase the runner's vital capacity; a greater vital capacity allows more oxygen to be taken in with each breath, helping delay fatigue and improving endurance performance.

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