Gas exchange in humans – 2023 November IGCSE 0610

1. Nov/2023 /Paper_ 0610/11/No.21

Which table correctly shows the difference in composition of inspired air compared with expired air?

A

	inspired air	expired air
oxygen	less	more
carbon dioxide	less	more

B

	inspired air	expired air
oxygen	less	more
carbon dioxide	more	less

C

	inspired air	expired air
oxygen	more	less
carbon dioxide	less	more

D

	inspired air	expired air
oxygen	more	less
carbon dioxide	more	less

2. Nov/2023 /Paper_ 0610/11/No.22

What is the site of gas exchange in humans?

A nose

B alveoli

C bronchus

D trachea

3. Nov/2023 /Paper_ 0610/13/No.21

Which row shows the composition of expired air from a healthy person?

	carbon dioxide %	oxygen %	water vapour
A	0.04	21	saturated
B	0.04	16	variable
C	4	21	variable
D	4	16	saturated

4. Nov/2023 /Paper_ 0610/13/No.22

What is the path of carbon dioxide as it leaves the lungs?

A alveolus → bronchiole → bronchus → trachea

B alveolus → bronchus → bronchiole → trachea

C trachea → bronchiole → bronchus → alveolus

D trachea → bronchus → bronchiole → alveolus

5. Nov/2023 /Paper_ 0610/21/No.21

Which table correctly shows the difference in composition of inspired air compared with expired air?

A

	inspired air	expired air
oxygen	less	more
carbon dioxide	less	more

B

	inspired air	expired air
oxygen	less	more
carbon dioxide	more	less

C

	inspired air	expired air
oxygen	more	less
carbon dioxide	less	more

D

	inspired air	expired air
oxygen	more	less
carbon dioxide	more	less

6. Nov/2023 /Paper_ 0610/21,22/No.21

What is the composition of expired air compared with inspired air?

	carbon dioxide	oxygen	water vapour
A	decreased	increased	increased
B	decreased	decreased	increased
C	increased	decreased	decreased
D	increased	decreased	increased

(a) During inspiration air is taken into the lungs.

Table 4.1 shows the structures that air passes through during inspiration.

The structures are **not** in the correct order.

Table 4.1

A	alveoli
B	bronchi
C	bronchioles
D	larynx
E	nose
F	trachea

Identify the order of structures that air travels through during inspiration.

Write the letters from Table 4.1 in the boxes provided to show the correct order.

One has been done for you.

		F			

[3]

(b) The composition of inspired air is different from the composition of expired air.

Describe the differences in composition between inspired and expired air.

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..... [4]

(c) A student investigated the composition of inspired and expired air.

Fig. 4.1 shows the apparatus that was used.

The student breathed in and out, through the mouthpiece, for 15 seconds.

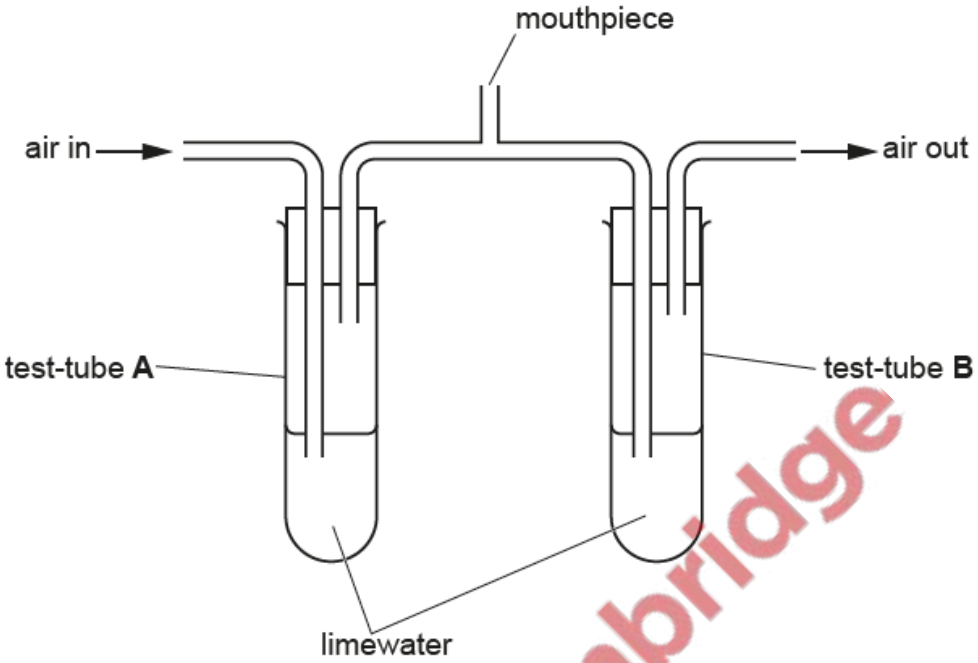

Fig. 4.1

(i) State the name of the gas that can be identified using limewater.

..... [1]

(ii) Using the information in Fig. 4.1, predict what happened to the limewater in test-tube **A** and in test-tube **B**.

test-tube **A** .....

test-tube **B** .....

[2]

8. Nov/2023 /Paper_ 0610/43/No.3

(a) (i) Complete Table 3.1 by writing in the percentages of carbon dioxide and oxygen in inspired air and in expired air.

Table 3.1

component	percentage in inspired air	percentage in expired air
carbon dioxide		
oxygen		

[2]

(ii) A scientist measured the number of dust particles in inspired air and in expired air.

They found fewer dust particles in expired air.

Suggest a reason for their observation.

.....

.....

..... [1]

(b) Fig. 3.1 is a diagram of alveoli and associated blood vessels.

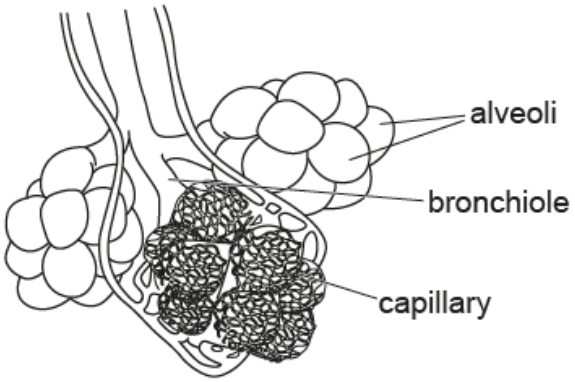

Fig. 3.1

(i) Explain how the structure of a capillary is related to its function.

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..... [3]

(ii) State the name of the component of blood that transports oxygen.

..... [1]

(iii) State the name of the blood vessel that transports blood from the heart towards the capillaries in the lungs.

..... [1]

(iv) State the location and function of cartilage in the breathing system.

location .....

function .....

.....

..... [2]

(c) A student measured the rate and depth of breathing of an athlete for 30 seconds at rest.

The data are shown in Fig. 3.2.

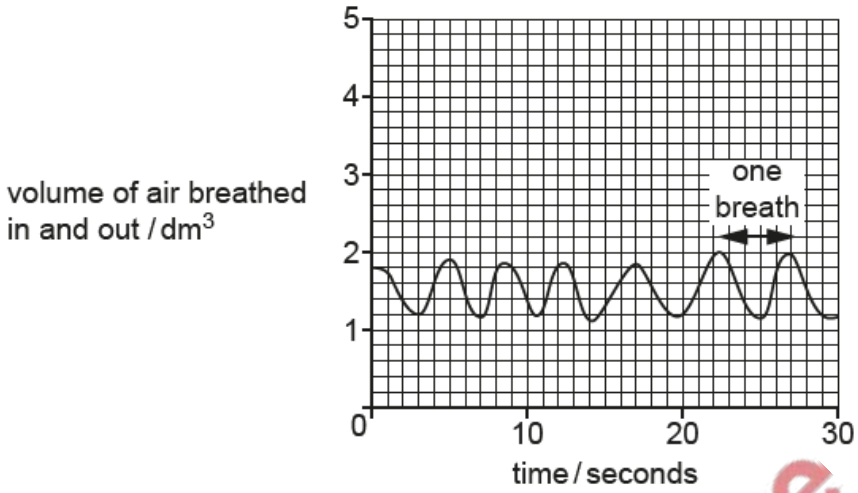

Fig. 3.2

(i) Using the information in Fig. 3.2, calculate the rate of breathing at rest.

..... breaths per minute [1]

The measurements were repeated while the athlete was running on a treadmill.

The data are shown in Fig. 3.3.

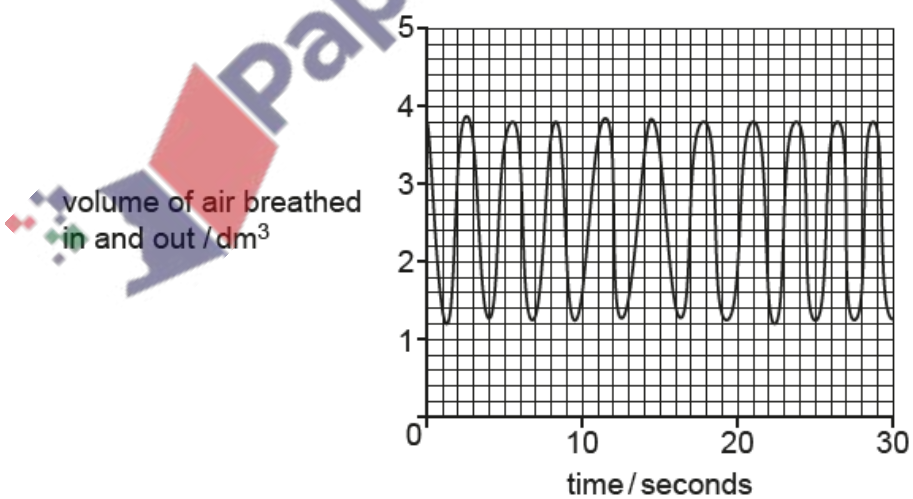

Fig. 3.3

(ii) Using the information in Fig. 3.3, calculate the volume of air inspired in **one** breath from 25 seconds.

..... dm^3 [1]

(iii) Explain the effect of exercise on the rate and depth of breathing shown in Fig. 3.2 and Fig. 3.3.

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..... [4]

[Total: 16]