

Q1 (1 mark)

To exchange gases (oxygen in, carbon dioxide out)

Q2 (1 mark)

Alveoli

Q3 (1 mark)

Oxygen

Q4 (1 mark)

Carbon dioxide

Q5 (2 marks)

Any two:

- Trachea
- Bronchi
- Bronchioles
- Lungs
- Alveoli

Q6 (2 marks)

Any two:

- Large surface area
- Thin walls
- Good blood supply
- Moist surface

Q7 (2 marks)

Any two:

- Exercise
- Smoking
- Asthma
- Illness

Q8 (2 marks)

Any two:

- Leaves
- Stomata
- Guard cells

Q9 (3 marks)

- Oxygen diffuses into alveoli (1)
- Into blood capillaries (1)
- Due to concentration gradient (1)

Q10 (3 marks)

- Diaphragm contracts (1)
- Moves down/flattens (1)
- Increases chest volume, drawing air in (1)

Q11 (3 marks)

- Diaphragm relaxes (1)
- Moves up (1)
- Decreases chest volume, forcing air out (1)

Q12 (3 marks)

- Stomata are pores in leaves (1)
- When open allow gas exchange (1)
- Controlled by guard cells (1)

Q13 (3 marks)

- Damages cilia in airways (1)
- Tar builds up in lungs (1)
- Reduces gas exchange efficiency (1)

Q14 (3 marks)

- Airways become inflamed (1)
- Narrowing of airways (1)
- Difficulty breathing (1)

Q15 (4 marks)

- Exercise increases oxygen demand (1)
- Breathing rate increases (1)
- Lung volume increases (1)
- More carbon dioxide removed (1)

Q16 (4 marks)

- Airways become narrowed (1)
- Less air reaches lungs (1)
- Reduced oxygen in blood (1)
- Difficulty breathing (1)

Q17 (4 marks)

- Air enters when pressure in lungs is lower (1)
- Volume increases → pressure decreases (1)
- Air leaves when pressure is higher (1)
- Volume decreases → pressure increases (1)

Q18 (6 marks)

Levelled response:

1-2 marks:

Basic statements about lungs or breathing
Little detail about structure

3-4 marks:

Some correct structures and functions
Limited explanation of gas exchange

5–6 marks:

Clear explanation of full system with adaptations
Correct scientific terminology

Expected content:

- Trachea carries air to lungs (1)
- Bronchi divide air into lungs (1)
- Alveoli are site of gas exchange (1)
- Capillaries surround alveoli (1)
- Large surface area/thin walls (1)
- Efficient diffusion of gases (1)

Example full-mark answer:

“The trachea carries air into the lungs and splits into the bronchi which split into smaller branches called bronchioles. These carry air to the alveoli at their ends, where gas exchange takes place. The alveoli are surrounded by blood capillaries. Oxygen diffuses into the blood and carbon dioxide diffuses out. The alveoli have a large surface area and thin walls for fast diffusion, making gas exchange efficient.”

Q19 (6 marks)

Levelled response:

1–2 marks:

Basic statements about breathing or lungs
Little explanation of pressure changes

3–4 marks:

Some correct ideas about diaphragm and rib cage
Mentions inhalation or exhalation

5–6 marks:

Clear explanation using pressure-volume model
Correct sequence of breathing in and out

Expected content:

- Diaphragm contracts and moves down (1)
- Rib cage moves up and out (1)
- Volume increases, pressure decreases (1)
- Air moves into lungs (1)
- Opposite happens in exhalation (1)
- Air is forced out due to pressure difference (1)

Example full-mark answer:

"When breathing in, the diaphragm contracts and moves down while the rib cage moves up and out. This increases the volume of the chest and lowers the pressure inside the lungs, so air moves in. When breathing out, the diaphragm relaxes and moves up, and the rib cage moves down and in. This decreases the volume and increases the pressure, forcing air out of the lungs."

Q20 (6 marks)

Levelled response:

1-2 marks:

Basic statements about exercise, asthma or smoking
Limited effects explained

3-4 marks:

Some correct effects on breathing or lungs
Mentions at least two factors

5-6 marks:

Clear explanation of all three factors with effects on gas exchange

Expected content:

- Exercise increases breathing rate and oxygen demand (1)
- Asthma narrows airways and reduces airflow (1)

- Smoking damages lungs and reduces gas exchange efficiency (1)
- Tar builds up in lungs (1)
- Less oxygen reaches blood (1)
- Breathing becomes more difficult (1)

Example full-mark answer:

“Exercise increases the body’s demand for oxygen, so breathing rate increases. Asthma causes the airways to become narrow, making it harder for air to reach the lungs. Smoking damages the lungs and leaves tar deposits, which reduces the efficiency of gas exchange. These effects all make it harder for oxygen to enter the blood and for carbon dioxide to be removed.”

Q21 (6 marks)

Levelled response:

1–2 marks:

Basic statements about stomata or leaves
Little explanation of gas exchange

3–4 marks:

Some correct ideas about stomata and gases
Limited link to photosynthesis

5–6 marks:

Clear explanation of gas exchange and stomata function
Includes photosynthesis and water loss

Expected content:

- Stomata are pores in leaves (1)
- Carbon dioxide enters for photosynthesis (1)
- Oxygen leaves as a waste product (1)
- Water vapour can escape (1)
- Guard cells control opening and closing (1)
- Balance between gas exchange and water loss (1)

Example full-mark answer:

“Stomata are small pores found in the leaves of plants. They allow carbon dioxide to enter the leaf for photosynthesis. Oxygen produced during photosynthesis leaves through the stomata. Water vapour can also escape, which is called transpiration. Guard cells control the opening and closing of stomata to balance gas exchange and prevent too much water loss.”

