

AQA, OCR

A Level

A Level Biology

Lung Function Questions

Name:

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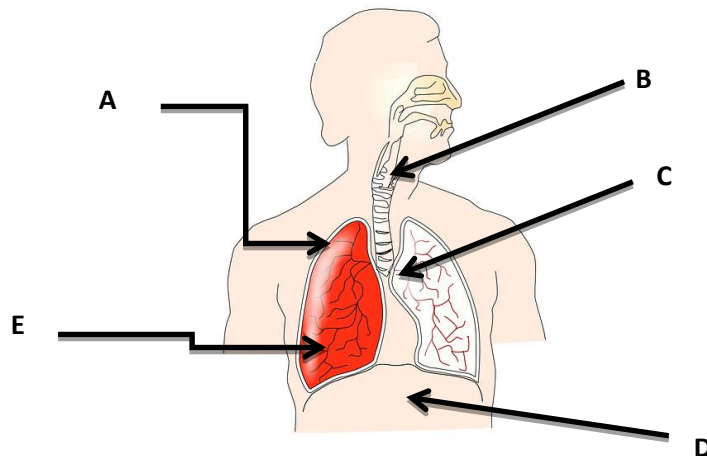
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Total Marks:

Lung Function

The surface for gas exchange in mammals is in the lungs. Here oxygen that is taken into the body through inhalation is transported to the respiring cells around the body in the blood and carbon dioxide produced by the respiring cells is transported in the blood to the lungs where it is exhaled.

1. The diagram below shows the human respiratory system.



a) i) Label the parts shown by the arrows. (5 marks)

ii) The alveoli are the gas exchange surface in the human body. How are the alveoli adapted for efficient gas exchange? (6 marks)

b) The gaseous exchange system is made of different cell types. One example of this is the rings of cartilage that support the tracheae and bronchi when the pressure changes inside the respiratory tract.

i) Why are elastic fibres important in the gaseous exchange system? (3 marks)

2. Ventilation is the action of breathing in and out and it is controlled by internal movements.

a)

i) Describe the mechanism of inspiration in detail making reference to volume and pressure changes (6 marks)

ii) What is meant by the term residual air? (1 mark)

iii) What is pulmonary ventilation and what information is required in order to calculate it? (3 marks)

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3. There are many different diseases that can affect lung function; some are more common than others, some are as a result of environmental factors and some are genetic.

a) TB, *Mycobacterium tuberculosis*, is a bacterium transmitted via droplet infection. While the infection is much less common in the developed world because of the introduction of the BCG vaccine worldwide there is still a high prevalence of TB, particularly in many African countries.

i) What is meant by 'transmission via droplet infection'? (2 marks)

b) TB infects the body through the bacteria multiplying and becoming embedded in the lung wall. This causes fibrosis which damages the alveoli.

i) Why do people infected with TB suffer from symptoms of shortness of breath and a persistent cough? (3 marks)

c) Other lung diseases include lung cancer, chronic bronchitis, asthma and emphysema.

i) What environmental factors contribute to the onset of emphysema? (2 marks)

ii) Emphysema causes inflammation of the living lung tissue, how does this lead to the alveoli having significantly reduced surface area? (2 marks)

iii) How do cigarettes cause the inflammation of the lungs and increased coughing exhibited in chronic bronchitis? (4 marks)