

Name of the Student: _____

Max. Marks : 28 Marks

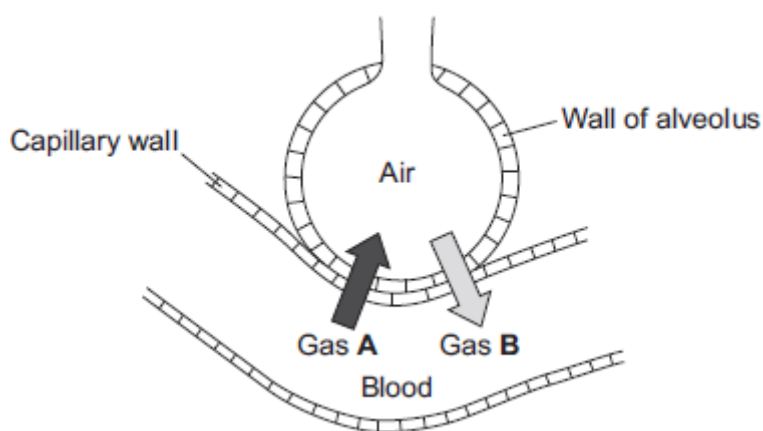
Time : 28 Minutes

Q1.

Gas exchange takes place in the lungs.

The diagram shows an alveolus next to a blood capillary in a lung.

The arrows show the movement of two gases, **A** and **B**.



- (a) (i) Draw a ring around the correct answer to complete the sentence.

Gases **A** and **B** move by

diffusion.
osmosis.
respiration.

(1)

- (ii) Gas **A** moves from the blood to the air in the lungs.

Gas **A** is then breathed out.

Name Gas **A**.

(1)

- (iii) Which cells in the blood carry Gas **B**?

Draw a ring around the correct answer.

platelets

red blood cells

white blood cells

(1)

- (b) The average number of alveoli in each human lung is 280 million.

The average surface area of 1 million alveoli is 0.25 m^2 .

Calculate the total surface area of a human lung.

Answer _____ m^2

(2)

- (c) An athlete trains to run a marathon. The surface area of each of the athlete's lungs has increased to 80 m^2 .

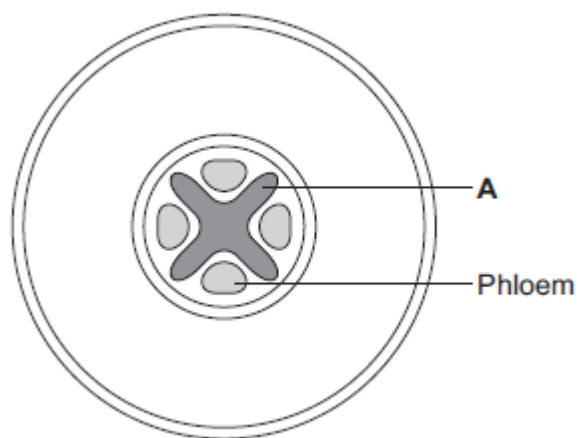
Give **one** way in which this increase will help the athlete.

(1)

(Total 6 marks)

Q2.

The diagram below shows a cross-section of a plant root. The transport tissues are labelled.



- (a) (i) What is tissue **A**?

Draw a ring around the correct answer.

cuticle

epidermis

xylem

(1)

- (ii) Name **two** substances transported by tissue **A**.

1. _____

2. _____

(2)

- (b) Phloem is involved in a process called translocation.

- (i) What is translocation?

(1)

- (ii) Explain why translocation is important to plants.

(2)

- (c) Plants must use active transport to move some substances from the soil into root hair cells.

- (i) Active transport needs energy.

Which part of the cell releases most of this energy?

Tick (✓) **one** box.

mitochondria

☐

nucleus

☐

ribosome

☐

(1)

(ii) Explain why active transport is necessary in root hair cells.

(2)

(Total 9 marks)

Q3.

Some infections are caused by bacteria.

- (a) The genetic material is arranged differently in the cells of bacteria compared with animal and plant cells.

Describe **two** differences.

(2)

- (b) Tuberculosis (TB) is an infection caused by bacteria.

The table below shows the number of cases of TB in different regions of southern England from 2000–2011.

Number of cases of TB per 100 000 people

Year	London	South East	South West
2000	37	5	3
2001	36	6	4
2002	42	6	6
2003	42	7	4
2004	42	7	5
2005	49	8	5
2006	44	8	3
2007	43	8	5
2008	44	8	5
2009	44	9	6
2010	42	9	5
2011	45	10	5

- (i) How does the number of cases of TB for London compare with the rest of southern England?

(1)

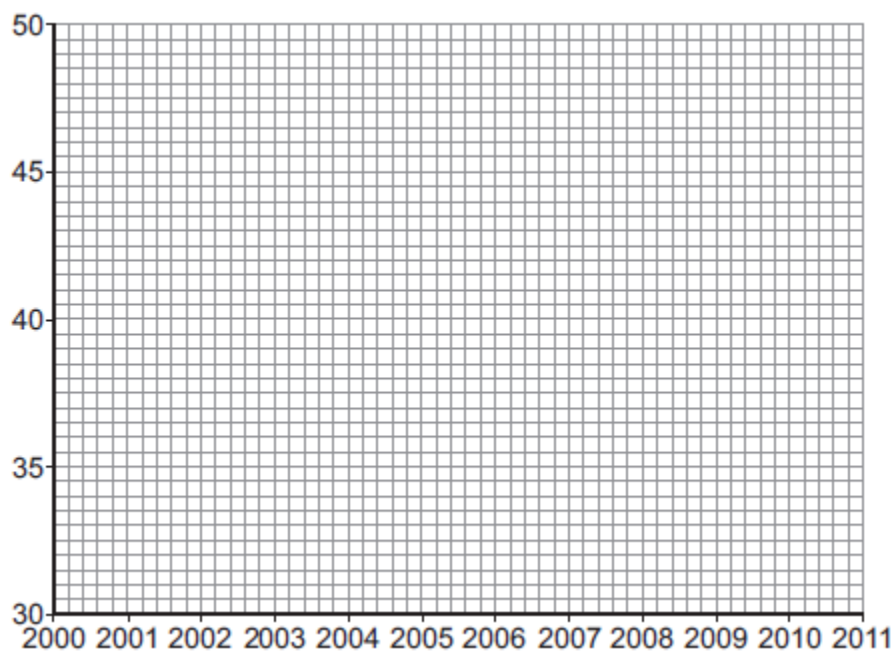
(ii) Describe the pattern in the data for cases of TB in the South East.

(1)

(iii) Describe the pattern in the data for cases of TB in the South West.

(2)

- (c) (i) On the graph paper below:
- plot the number of cases of TB in **London**
 - label both the axes on the graph
 - draw a line of best fit.



(4)

(ii) Suggest why a student thought the value for 2005 in London was anomalous.

(1)

(d) People can be vaccinated against TB.

Suggest how a vaccination programme would reduce the number of people with TB.

Details of how a vaccine works are **not** required.

(2)

(Total 13 marks)