1 **(a)** Fig. 1.1 shows part of the human gas exchange system.

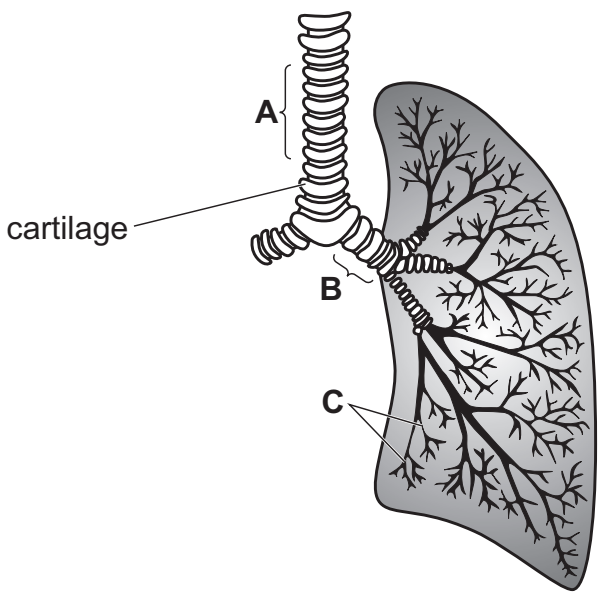

Fig. 1.1

(i) Identify structures **A**, **B** and **C** shown in Fig. 1.1.

A .....

B .....

C .....

[3]

(ii) State the function of the cartilage shown in Fig. 1.1.

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..... [1]

(iii) Explain how inspiration occurs.

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[4]

(b) Cystic fibrosis is a condition that affects the lungs. People with cystic fibrosis have mucus in the airways of their lungs that is thicker and stickier than usual.

(i) Two types of cells that line the airways protect the body against pathogens and particles.

State the names of these **two** types of cell **and** describe how they protect the body.

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..... [3]

(ii) Suggest how having thicker and stickier mucus in the airways affects the ability of a person to do exercise.

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..... [4]

(c) Cystic fibrosis is an inherited condition in humans caused by a recessive allele of a gene.

There are two alleles for this gene:
- the allele for no cystic fibrosis is represented by the letter **F**
- the allele for cystic fibrosis is represented by the letter **f**.

Two heterozygous parents wanted to have a child.

Complete the genetic diagram to predict the probability of these parents having a child with cystic fibrosis.

parental phenotypes no cystic fibrosis x no cystic fibrosis

parental genotypes ..... x .....

gametes ..... , ... x ..... , ...

offspring genotypes ....

offspring phenotypes ....

probability of having a child with cystic fibrosis .....

[5]

[Total: 20]