

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
TWENTY FIRST CENTURY SCIENCE  
ADDITIONAL APPLIED SCIENCE A**

**A324/02**

Life Care  
(Higher Tier)

**Friday 12 June 2009  
Morning**

**Duration: 45 minutes**

Candidates answer on the question paper  
A calculator may be used for this paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Pencil
- Ruler (cm/mm)



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

**INFORMATION FOR CANDIDATES**

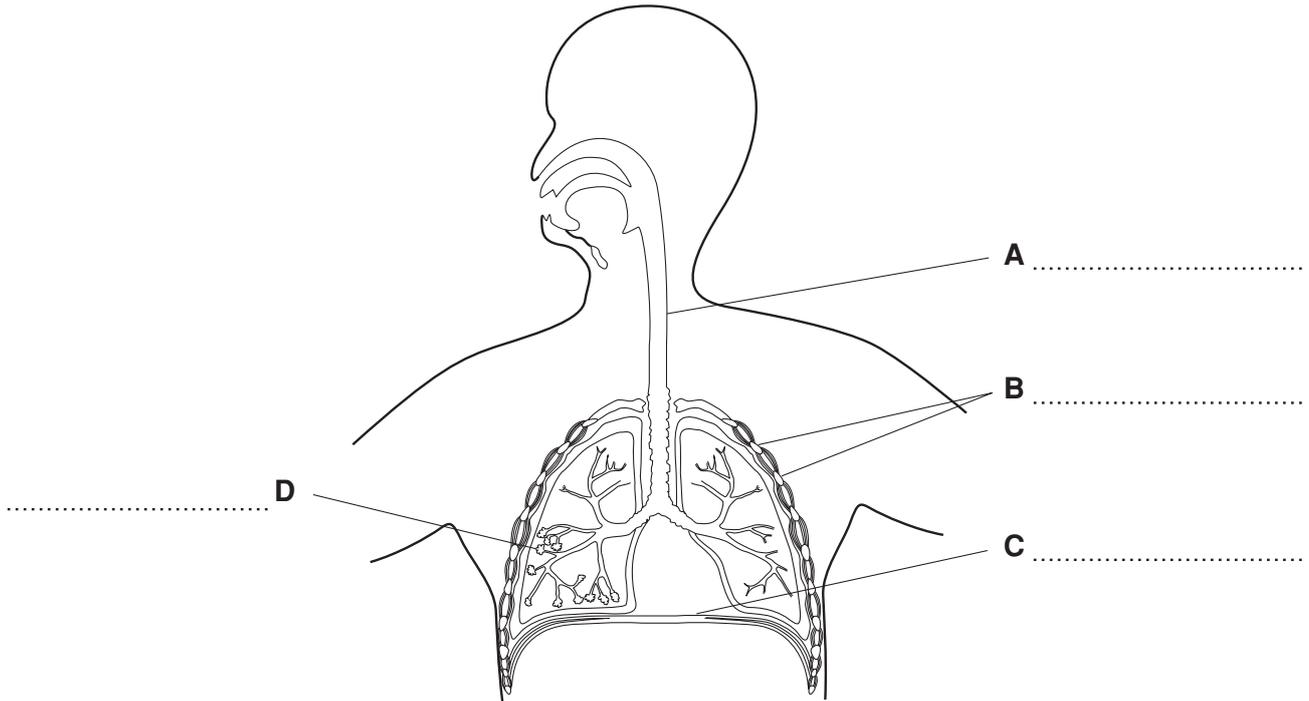
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **36**.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 Martin has asthma which affects his breathing system.

The diagram shows parts of his breathing system.

(a) Complete the four labels on the diagram.



[4]

(b) Gas exchange takes place through the alveoli.

State **two** features of the alveoli that help gas exchange **and** explain how each one does this.

feature 1.....

how this helps gas exchange.....

.....

feature 2.....

how this helps gas exchange.....

..... [4]

(c) During an asthma attack all the tubes leading to the alveoli become smaller.

This makes it hard for Martin to breathe.

When Martin first developed asthma he tried several different types of medication.

(i) Suggest why it was necessary for him to try different treatments.

.....  
..... [1]

(ii) Explain why the medication has not cured his asthma.

.....  
.....  
..... [2]

**[Total: 11]**

2 Assam works in a hospital accident and emergency unit.

He examines lots of patients every day.

(a) The lists show the condition of some of Assam's patients and the diagnostic tests he uses.

Draw a line from each **condition** to the most appropriate **test**.

One has been done for you.

condition	test
footballer with a damaged knee joint	ultrasound scan
lady with a suspected broken arm	MRI scan
man with suspected food poisoning	X-ray
child with a suspected fractured skull	faecal sample
pregnant woman worried that her unborn baby has stopped moving	CT scan

[3]

(b) Assam uses non-invasive techniques whenever possible.

Explain what is meant by a non-invasive technique.

.....  
.....  
..... [2]

(c) Assam's department has just installed a new PET scanner.

Write down **one** medical use for a PET scan.

.....  
..... [1]

[Total: 6]

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3 Malik is admitted to hospital with heart problems.

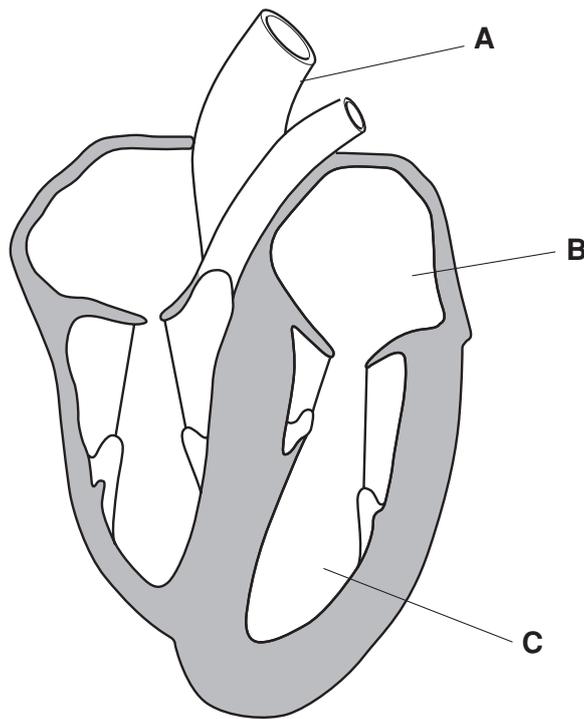
Diagnostic tests are carried out to determine the extent of the problem.

(a) Explain why the risk to Malik must be assessed before the diagnostic tests can be carried out.

.....  
.....  
..... [2]

The tests on his heart show that both ventricles are not working properly.

(b) Look at the diagram of the heart.



Which label **A**, **B**, or **C** shows a ventricle?

answer ..... [1]

(c) Malik has to wait for a heart transplant.

An artificial heart is offered to Malik while he waits for the transplant.

Malik considers the offer very carefully.

Explain the advantages **and** disadvantages Malik needs to consider before he decides whether or not to have the artificial heart.

advantages .....

.....

..... [2]

disadvantages.....

.....

..... [2]

(d) Malik will have the operation at a regional hospital instead of his local hospital.

Use your understanding of a national health service to explain why.

.....

.....

.....

..... [3]

(e) When Malik has had his treatment his progress will need to be closely monitored.

Briefly describe how his progress may be closely monitored while he is still in hospital.

.....

.....

..... [2]

[Total: 12]

- 4 The National Institute for Clinical Excellence (NICE) have said that the National Health Service (NHS) should pay for an expensive new drug to help people quit smoking.

There are different views about this.



- (a) Use your knowledge of the NHS to explain how supplying this drug could prove to be cost effective in the long term.

.....

.....

.....

..... [2]

- (b) Public health campaigns have been used to help people to stop smoking.

Briefly describe **one other** example of a public health campaign that you know about.

.....

.....

.....

..... [2]

[Total: 4]

- 5 Two supermodels have died as a result of eating disorders and young models may soon be required to provide 'good health' certificates before they can take to the catwalk.

The Madrid Fashion Week has banned models with a Body Mass Index (BMI) below 18.5.

- (a) Shareen wants to become a model.

The modelling agency measures her height and mass and calculates her BMI.

Shareen is 1.5 metres tall and has a mass of 41 kg.

Calculate Shareen's BMI.

Use the equation:

$$\text{BMI} = \frac{\text{mass in kg}}{(\text{height in m})^2}$$

Show your working.

BMI = .....[2]

- (b) The modelling agency check her BMI value using this table.

BMI value	condition
under 20	underweight
20.0–24.9	desirable range
25.0–29.9	overweight
30.0–34.9	obese
over 35	severely obese

Suggest and explain what advice the modelling agency should give Shareen.

.....  
 .....  
 ..... [1]

[Total: 3]

END OF QUESTION PAPER

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