

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

**F A324/01**

Life Care

FOUNDATION TIER

Morning

**WEDNESDAY 13 JUNE 2007**

Time: 45 minutes

Candidates answer on the question paper.

Calculators may be used.

Additional materials: Pencil  
Ruler (cm/mm)



\* OCR / T / 32900 \*

Candidate  
Name

Centre  
Number

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Candidate  
Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your name, Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- **WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.**

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The marks allocated and the spaces provided for your answers are a good indication of the length of answers required.

FOR EXAMINER'S USE		
Qu.	Max	Mark
1	9	
2	10	
3	9	
4	8	
<b>TOTAL</b>	<b>36</b>	

This document consists of **8** printed pages.

Answer **all** the questions.

1 Joe is celebrating the end of the exams with some friends.



It is hot in the restaurant and Joe feels too warm.  
His body responds to the change in temperature.  
The responses are shown below.  
They are in the **wrong** order.

- A Skin capillaries open to allow blood to flow closer to the surface of the skin.
- B Temperature receptors in the skin detect an increase in temperature.
- C Joe starts to sweat.
- D Joe looks red as heat energy is transferred to the air.
- E Heat energy is used to evaporate sweat into the air.

(a) (i) Fill in the boxes to show the best order.  
The first one has been done for you.

<b>B</b>				
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[2]

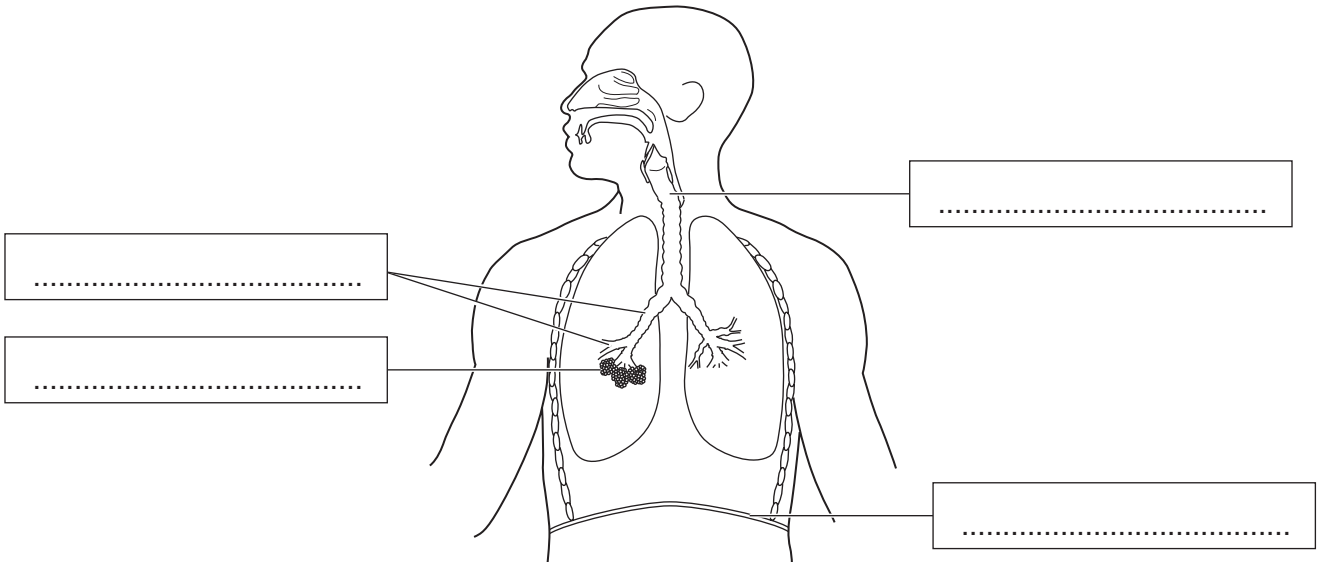
(ii) Suggest **one** other reason why Joe might be feeling too warm.

.....

.....[1]

(b) Joe starts to choke.  
Some of the food is blocking his trachea.

(i) The diagram shows part of Joe's respiratory system.



Label the diagram. Choose words from this list.

[4]

**alveoli**

**bronchial tubes**

**diaphragm**

**intercostal muscles**

**ribs**

**trachea**

(ii) Using your knowledge of the **respiratory system**, suggest why it is important to unblock Joe's trachea.

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

[Total: 9]

- 2 Shivani wants to become a pilot.  
She has a medical before she starts training.  
A nurse asks Shivani some questions.

- (a) Which **three** of the following will the nurse need to know about?  
Put ticks (✓) in the **three** correct boxes.

alcohol consumption	<input type="checkbox"/>
current medication	<input type="checkbox"/>
favourite colour	<input type="checkbox"/>
marital status	<input type="checkbox"/>
shoe size	<input type="checkbox"/>
tobacco consumption	<input type="checkbox"/>

[3]

- (b) The nurse collects urine and blood samples.

- (i) The urine sample is tested for various conditions.  
Draw a straight line from each **substance tested for** to its correct **condition**. One has been done for you.

**substance tested for****condition**

glucose

human chorionic gonadotrophin  
(hCG)

nitrite

protein

kidney disease

bacteria

cancer

diabetes

pregnancy

[3]

(ii) Describe how the nurse takes a blood sample.

.....

.....

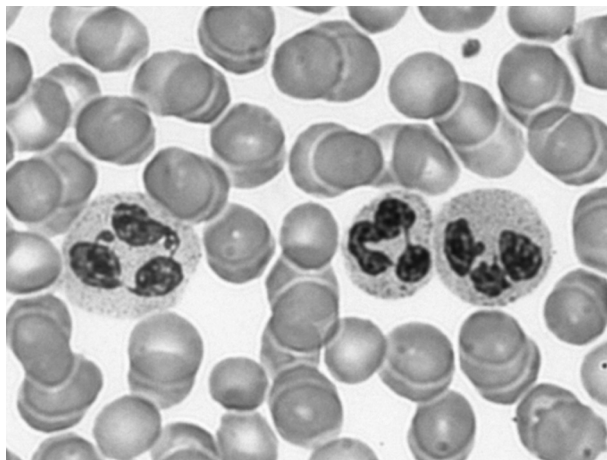
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.....

.....[3]

(iii) The picture below shows Shivani's blood under the microscope.

Label **one** red blood cell and **one** white blood cell.



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[1]

[Total: 10]

3 Jaimie is training to run in the Olympics.  
His coach checks his fitness regularly and changes his training programme when necessary.

(a) State and explain **two** reasons why the coach might need to unexpectedly change Jaimie's training programme.

reason .....

explanation .....

.....

.....

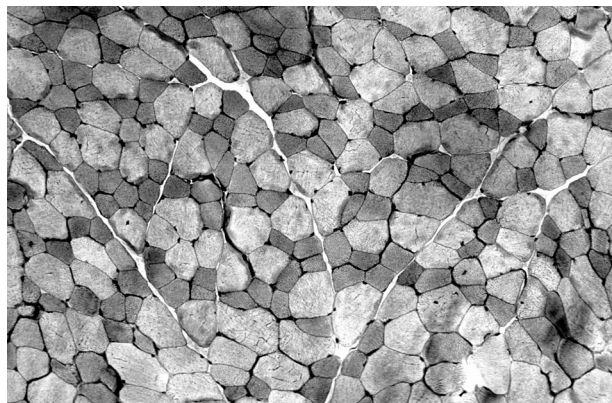
reason .....

explanation .....

.....

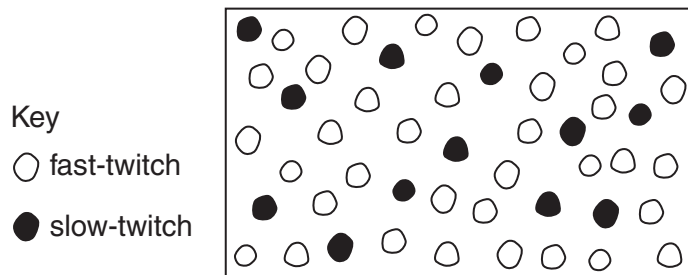
.....[4]

(b) The coach wants Jaimie to have a test on a muscle in his leg.  
Leg muscles contain two types of fibres.



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Slow-twitch fibres are good for long distance running.  
Fast-twitch fibres are good for sprinting.  
The diagram below shows the results of Jaimie's test.  
There are 37 fast-twitch muscle fibres in the diagram.



- (i) Count the number of slow-twitch muscle fibres in the **diagram**.

number of slow-twitch muscle fibres = .....[1]

- (ii) Calculate the percentage of slow-twitch fibres.  
Use the equation below.

$$\% \text{ of slow-twitch fibres} = \frac{\text{number of slow-twitch fibres}}{\text{total number of muscle fibres}} \times 100$$

% of slow-twitch fibres = .....[2]

- (iii) Calculate the percentage of fast-twitch fibres.

% of fast-twitch fibres = .....[1]

- (iv) The table below shows the ideal percentage of slow-twitch and fast-twitch muscle fibres for some running events.

event	slow-twitch fibres (%)	fast-twitch fibres (%)
100m sprint	23	77
1500 m run	50	50
10 000 m run	65	35
marathon	80	20

Use the table to suggest which event Jaimie is best suited to.

.....[1]

[Total: 9]

4 A community Health Centre needs a new nurse.  
Kim is writing an advertisement for the new nurse.  
He can think of a number of personal qualities a nurse might have.  
Below is a list of some of these qualities.

- A has good communication skills
- B has a good medical knowledge and range of experience
- C has good teeth
- D is a good listener
- E is good looking
- F is tactful
- G makes a good cup of coffee
- H recognises the importance of teamwork

(a) List the letters, **A, B, C, D, E, F, G** or **H**, of the **five** qualities which Kim should include in his advertisement.

.....[4]

(b) The new nurse will work with the rest of the healthcare team.  
Give the title and role of **one other** health practitioner likely to be a part of the healthcare team.

title .....

role .....

.....

.....[2]

(c) Kim would like the new nurse to be a non-smoker.  
He thinks that a lot of health problems can be avoided by adopting a healthy life style.

Suggest and explain **one** other example of a change in life style that could reduce the risk of a health problem.

.....

.....

.....[2]

[Total: 8]

**END OF QUESTION PAPER**

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