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90178

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Human Biology, 2005

90178 Describe functioning of human circulatory, respiratory and excretory systems

Credits: Six
9.30 am Thursday 24 November 2005

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–11 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe functioning of human circulatory, respiratory and excretory systems. ☐	Describe functioning of human circulatory, respiratory and excretory systems. ☐	Describe functioning of human circulatory, respiratory and excretory systems. ☐
	Explain functioning of human circulatory or respiratory or excretory systems. ☐	Discuss functioning of human circulatory or respiratory or excretory systems. ☐
Overall Level of Performance ☐		

You are advised to spend 60 minutes answering the questions in this booklet.

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QUESTION ONE: CIRCULATORY SYSTEM

A person's blood pressure is $\frac{110}{70}$.

(a) Explain what **each** of these figures means, and explain the **significance** of these figures to the person.

(b) Describe **hypertension**.

(c) Describe what could happen to the **blood vessels** or **heart** to cause hypertension.

QUESTION TWO: CIRCULATORY SYSTEM

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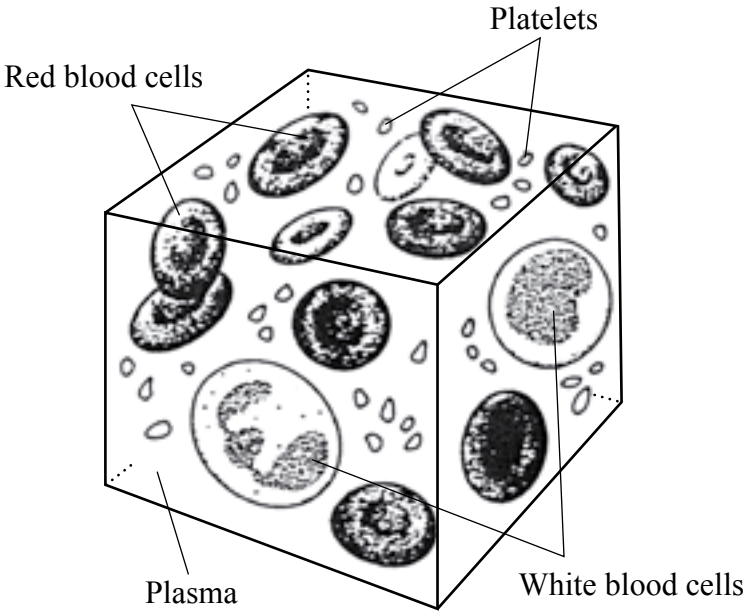
The diagram below shows components of the blood.



(a) Describe the function of each component of blood.

Component	Function
White blood cells	
Platelets	
Plasma	
Red blood cells	

The diagram below represents the human circulatory system.

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Source: Rosemary Hipkins and Lindsay Conner, *Alive and Well II: A Systems Approach*, (Auckland: Pearson Education New Zealand Ltd, 1999), p 59.

(b) Describe TWO **structural** differences between the aorta and the vena cava. **Explain** the importance of **each** of the two differences.

Structural Difference 1	
Aorta	Vena cava
Importance of Structural Difference 1	

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Structural Difference 2	
Aorta	Vena cava
Importance of Structural Difference 2	

(c) Describe the **main difference** in the composition of the blood between the pulmonary artery and pulmonary vein.

(d) Discuss the function of the capillaries in the circulatory system.

QUESTION THREE: RESPIRATORY SYSTEM

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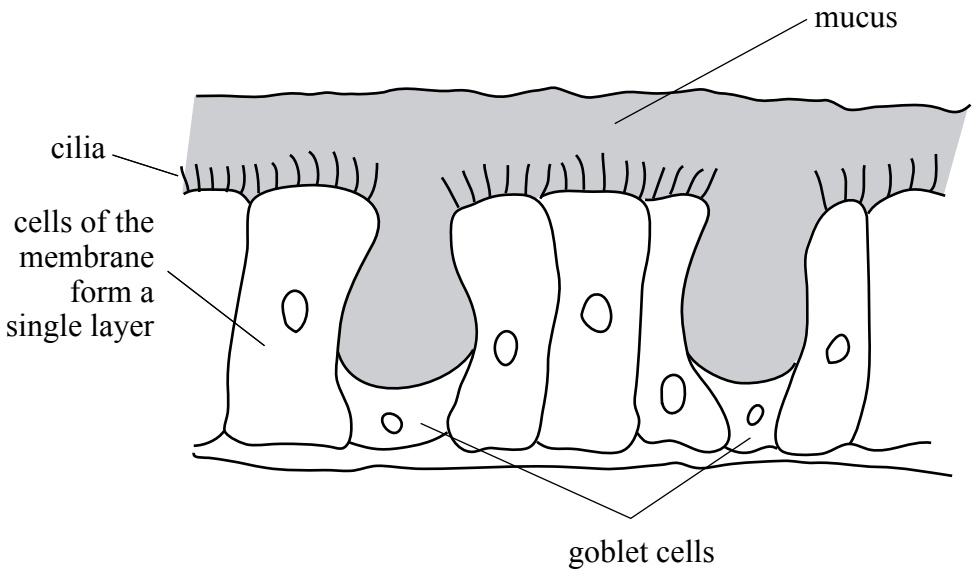
The diagram below shows the structure of the mucus membrane which lines the air passages.



(a) Describe the function of the **goblet cell**.

(b) Explain the function of the **cilia** that line the air passages.

(c) Explain ONE **effect** smoking has on the **lining** of the air passages.

(d) Describe the function of **alveoli** (air sacs).

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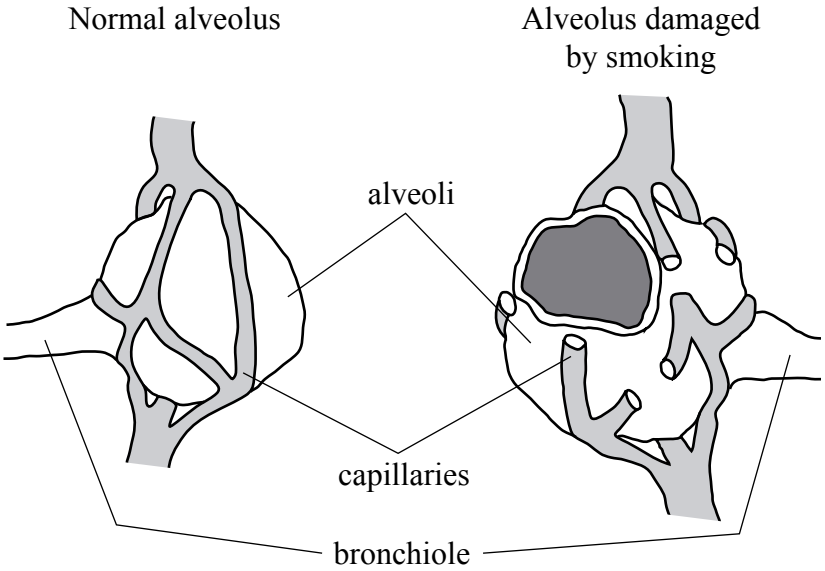
The diagram below shows a normal alveolus, and one damaged by many years of cigarette smoking.



(e) Identify and explain TWO ways this damage affects the **functioning** of the respiratory system.

QUESTION FOUR: EXCRETORY SYSTEM

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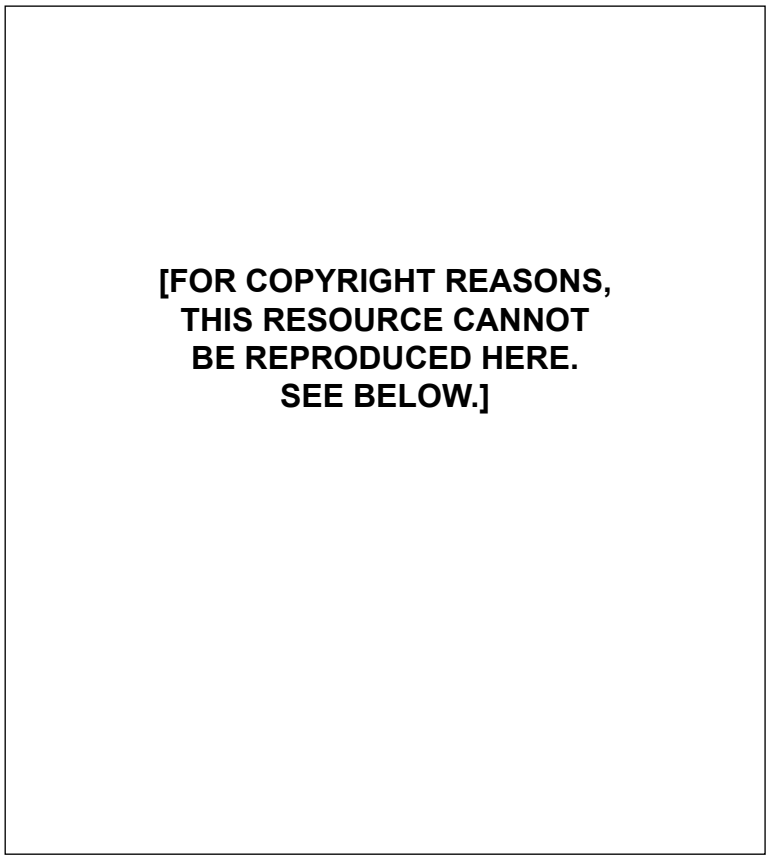
Each human kidney is made up of millions of kidney tubules. The diagram below shows one kidney tubule.



Source: Rosemary Hipkins and Lindsay Conner, *Alive and Well II: A Systems Approach*, (Auckland: Pearson Education New Zealand Ltd, 1999), p 73.

(a) Name THREE substances that pass **from** blood into the kidney tubule.

1. _____

2. _____

3. _____

(b) Explain how the substances in (a) pass from blood into the kidney tubule.

_____

_____

_____

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(c) Some substances or components of blood should **never** enter the kidney tubule.

(i) Name TWO of these substances or blood components.

1. _____

2. _____

(ii) Explain why these two substances or blood components cannot enter the kidney tubule.

_____

_____

_____

_____

(d) In hot weather, when a person sweats a lot, they urinate less often and the urine is a dark colour. In cold weather, a person sweats little; they urinate more and the urine is pale in colour.

Explain these observations referring to kidney functioning.

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(e) Discuss **how** a kidney allows the waste products to be filtered from the blood. You need to consider the composition of the blood in the renal artery AND the composition of the blood in the renal vein.

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Extra paper for continuation of answers if required.
Clearly number the question.

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Question number	