



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2017

Centre Number

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Candidate Number

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Life and Health Sciences

Assessment Unit AS 2
assessing
Human Body Systems



SZ021

[SZ021]
MONDAY 15 MAY, AFTERNOON

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Answer **all seven** questions.

Write your answers in the spaces provided in this question paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 75.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

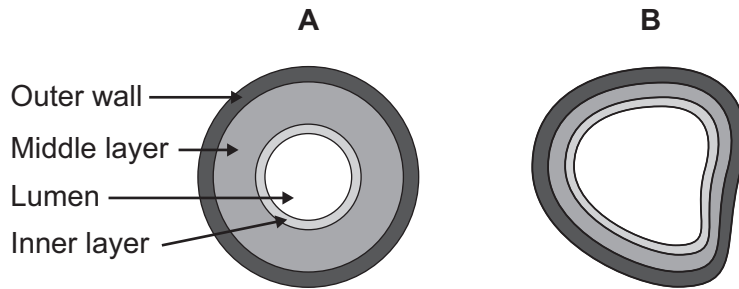
You may use an electronic calculator.

Quality of written communication will be assessed in Question 4.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total Marks	
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(b) The diagrams below show cross sections of two types of blood vessels; an artery and a vein.



Source: CCEA

State **two** visible features in Diagram A which indicate that it is an artery.

1. _____

 2. _____

- [2]

(c) Adam carried out an experiment to compare the effect of exercise on the blood pressures of his male and female classmates.

His classmates went for a run and they each measured their blood pressure when they had finished.

Evaluate this experiment by suggesting **three** ways in which this experiment could be improved.

1. _____

 2. _____

 3. _____

- [3]

Examiner Only	
Marks	Remark

(iii) State and explain **three** ways the alveoli are adapted for gas exchange.

1. _____

2. _____

3. _____

_____ [6]

Examiner Only

Marks

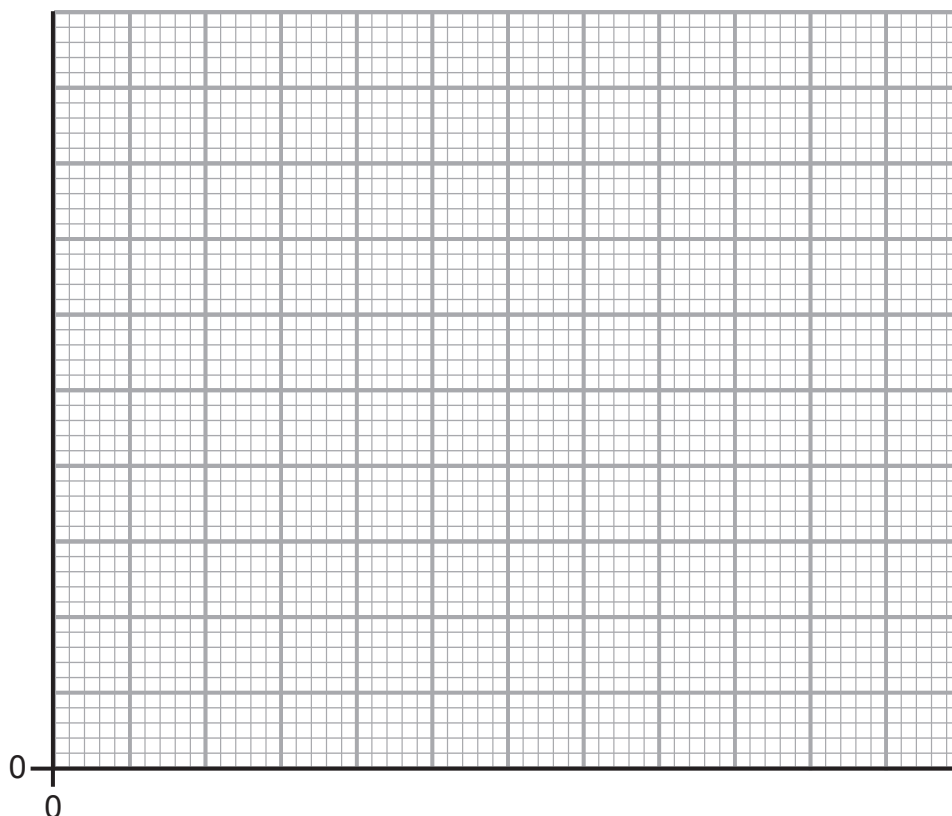
Remark

- (b) A patient with cystic fibrosis took part in a clinical trial to test if a drug was effective at improving his lung function. The percentage oxygen saturation of the patient's blood at different partial pressures of oxygen was measured. This was carried out both **before** treatment and **after** four weeks of drug treatment. The results are shown in the table below.

Partial pressure of oxygen in inhaled air/mmHg	Percentage saturation of blood with oxygen	
	Before treatment	After four weeks treatment
0	0	0
20	10	15
60	60	70
80	65	75
100	65	80
120	65	85

Source: Principal examiner

- (i) Plot these results on the graph paper, with partial pressure of oxygen in inhaled air on the x axis. Label both axes. [6]



Examiner Only	
Marks	Remark

- (ii) Use your graph to determine the difference in the percentage saturation for the patient with cystic fibrosis at a partial pressure of 40 mmHg **before** and **after** treatment.
Show your working.

_____ % [2]

- (iii) This drug may help counteract the effects of cystic fibrosis.
Suggest **one** way this drug may be acting to improve oxygen uptake by the blood.

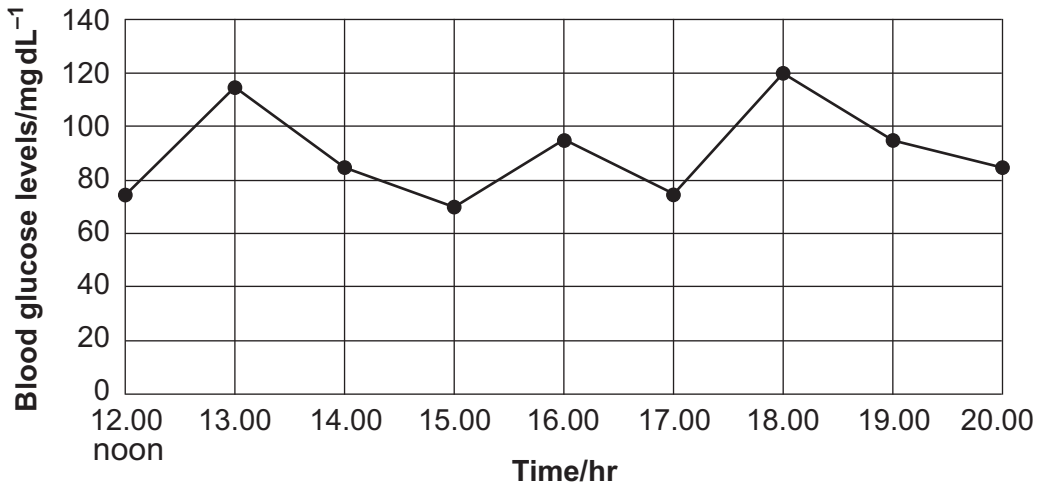
_____ [1]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

5 Blood glucose levels were measured in a healthy person over eight hours starting at 12.00 noon. The results are shown in the graph below.



(a) (i) Describe the trend shown in the graph between 12.00 noon and 15.00 hours.

[1]

(ii) On the appropriate graph axis indicate, using arrows, **two** times where the levels of **insulin** would be the highest. [2]

(iii) Why is insulin released at these times?

[1]

(iv) State **two** ways that insulin carries out its function.

[2]

Examiner Only	
Marks	Remark

- 6 A scientist wanted to find out whether taking a cholesterol-lowering **drink** or a cholesterol-lowering **drug** was more effective in reducing fasting blood cholesterol to healthy levels (5.0 mmol L^{-1} or less).

The scientist divided thirty healthy men aged 55, all with slightly elevated fasting cholesterol levels, into three groups.

All the men ate the same normal diet during the investigation.

Group 1: Ten men took one cholesterol-lowering **drug** each day.

Group 2: Ten men took one cholesterol-lowering **drink** each day.

Group 3: Ten men continued to eat a normal diet.

The investigation was carried out for twelve weeks.

Fasting blood cholesterol levels were measured in all thirty men before the beginning of the investigation (week 0) and during weeks 4, 8 and 12.

The results are shown in the table below.

Mean fasting blood cholesterol levels/ mmol L^{-1}				
	Week 0	Week 4	Week 8	Week 12
Group 1	6.7	4.8	4.3	4.0
Group 2	6.7	5.5	5.1	5.0
Group 3	6.6	6.6	6.6	6.6

Source: Principal examiner

- (a) (i) State the **main** function of cholesterol in the human body.

_____ [1]

- (ii) State the **main** effect of persistently high cholesterol levels on a person's health.

_____ [1]

Examiner Only

Marks Remark

(b) Both aerobic and anaerobic respiration produce ATP.

Give **three** differences between aerobic and anaerobic respiration in muscle cells.

1. _____

2. _____

3. _____

_____ [3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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