Centre No.						Paper Reference							Surname	Initial(s)
Candidate No.						6	1	1	2	/	0	1	Signature	

Paper Reference(s)

6112/01

Edexcel GCE

Biology (Human)

Advanced Subsidiary

Unit Test 2H

Wednesday 9 January 2008 – Morning

Time: 1 hour

Examiner's use only

Team Leader's use only

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
Total	

Materials required for examination
Ruler

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature.
The paper reference is shown above.
Check that you have the correct question paper.
Answer ALL the questions. Write your answers in the spaces provided in this question paper.
Show all the steps in any calculations and state the units. Calculators may be used.
Include diagrams in your answers where these are helpful.

Information for Candidates

The marks for individual questions and parts of questions are shown in round brackets: e.g. **(2)**.
There are 8 questions in this question paper. The total mark for this paper is 60.

Advice to Candidates

You will be assessed on your ability to organise and present information, ideas, descriptions and arguments clearly and logically, taking account of your use of grammar, punctuation and spelling.

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Answer ALL questions in the spaces provided.

1. Read through the following passage about blood cells, and then complete the passage by writing the most appropriate word or words on the dotted lines.

White blood cells (leucocytes) can be classified into two groups, granulocytes and agranulocytes.

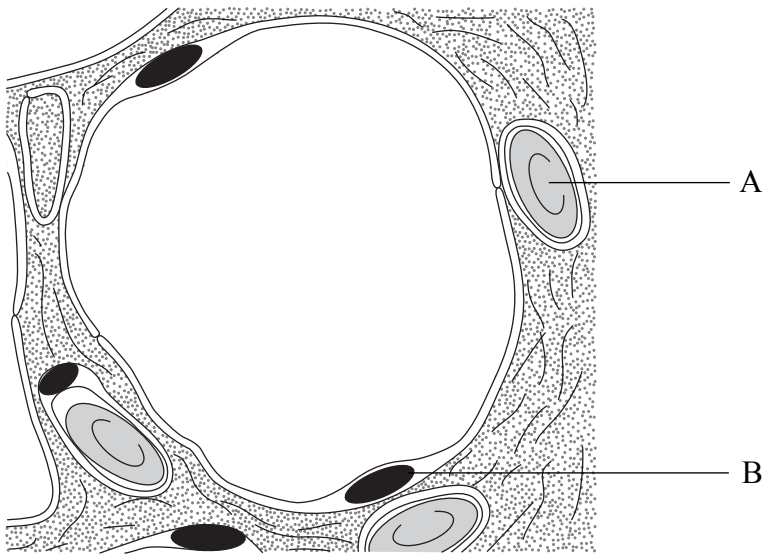
Agranulocytes include lymphocytes and ……. Lymphocytes secrete ……. in the presence of antigens. Granulocytes include neutrophils and ……. Neutrophils can be recognised in a stained film of blood, using a microscope, as they have an irregularly-shaped ……., which typically has up to five lobes.

Q1

(Total 4 marks)

Leave blank

2. The diagram below shows a section through an alveolus and the surrounding tissue.



Magnification × 2000

(a) Name the cells labelled A and B.

A .....

B .....

(2)

Leave blank

(b) Describe and explain how alveoli are adapted for the function of gas exchange.

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(4)

(c) The pulmonary ventilation rate is found by multiplying the tidal volume by the number of breaths taken per minute.

Calculate the pulmonary ventilation rate for a person breathing a tidal volume of 0.45 dm^3, 18 times per minute.

Answer ..... dm^3.

(1)

Q2

(Total 7 marks)

Leave blank

3. (a) The table below refers to the digestion of carbohydrates. Complete the table by writing the most appropriate word or words in the empty boxes.

Carbohydrate	Enzyme	Products
Starch		Maltose
Lactose	Lactase	
		Glucose and fructose

(4)

(b) Monosaccharides, such as glucose, are absorbed from the small intestine into the bloodstream. Suggest an explanation for each of the following.

(i) Glucose can be absorbed against its concentration gradient.

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(ii) The absorption of glucose is increased in the presence of sodium ions.

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(iii) Glucose is absorbed faster than fructose.

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(3)

(Total 7 marks)

Q3

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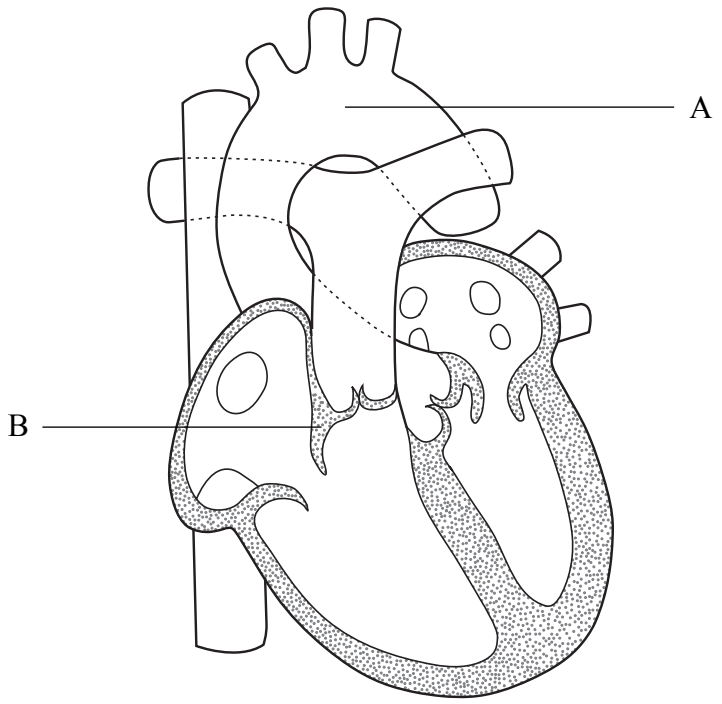
4. (a) The diagram below shows a section through the heart of a mammal.



Name the parts labelled A and B.

A .....

B .....

(2)

Turn over

Leave blank

(b) Heart muscle has a relatively high demand for oxygen. Explain how heart muscle is supplied with oxygen.

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(3)

(c) During the cardiac cycle, the atria contract and then the ventricles contract.

Explain how this sequence of events is coordinated.

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(3)

Leave blank

(d) The table below shows the effect of exercise on blood flow to the muscles of an adult man.

Blood flow at rest / $dm^3\ min^{-1}$	Blood flow during exercise / $dm^3\ min^{-1}$
1.0	16.0

Suggest an explanation for the change in blood flow as shown in the table.

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(3)

(Total 11 marks)

Q4

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5. (a) Explain what is meant by each of the following terms.

Frostbite

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Trench foot

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(4)

Leave blank

(b) An investigation was carried out into the effect of having a hot bath on the core body temperature of a man. The man measured his body temperature, then lay in a bath of water at a temperature of 42 °C for 10 minutes. After 10 minutes, he got out of the bath and sat on a chair. He took readings of his body temperature at regular time intervals during the investigation.

The results are shown in the table below.

Time / min	Body temperature / °C
0 (start of investigation)	37.0
5 (got into bath)	37.0
10 (got out of bath)	37.8
15 (sitting on chair)	37.6
20 (sitting on chair)	37.4

Describe and suggest explanations for the changes in body temperature during each of the following time intervals.

(i) 5 to 10 minutes

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(ii) 10 to 20 minutes

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(4) **Q5**

(Total 8 marks)

Leave blank

6. Colostrum is a fluid secreted by a mother's mammary glands for the first few days after a baby is born.

(a) Explain the importance of colostrum to a new-born baby.

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(2)

(b) The table below shows some of the components of human colostrum, human milk, and cows' milk.

	Protein / g per 100 cm^3	Lactose / g per 100 cm^3	Fat / g per 100 cm^3
Human colostrum	8.5	3.5	2.5
Human milk	1.5	7.0	4.0
Cows' milk	3.5	4.7	3.5

(i) Compare the protein and lactose content of human colostrum with human milk.

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(2)

(ii) Using the evidence in the table, suggest **one** advantage of feeding a baby with cows' milk, rather than with human milk. Give an explanation for your answer.

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(2) **Q6**

(Total 6 marks)

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7. (a) The table below shows the relationship between altitude above sea level and the partial pressure of oxygen in the alveoli of a person breathing air.

Altitude above sea level / m	Partial pressure of oxygen in the alveoli / kPa
0	13.87
3000	8.93
10000	2.80
130000	1.07
160000	0.13

(i) Describe the relationship between altitude and the partial pressure of oxygen in the alveoli.

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(2)

(ii) Explain why people who are not acclimatised to high altitudes rapidly lose consciousness at altitudes of over 5000 m.

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(2)

Leave blank

(iii) Name two environmental factors that **increase** at high altitudes.

1 .....

2 .....

(2)

(b) Sherpas are people in the Himalayas who live and work at altitudes of over 4000 m. Suggest **three** ways in which Sherpas are adapted, or acclimatised, to life at high altitudes.

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2 .....

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3 .....

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(3) **Q7**

(Total 9 marks)

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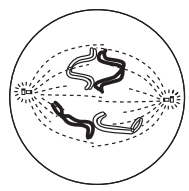
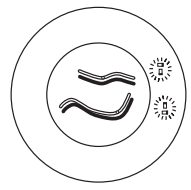
8. (a) The diagrams below show some of the stages of meiosis I in an animal cell. The diploid number (2n) of this cell is 4.

A

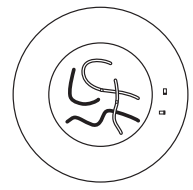


B

C



D



E

Write the letters in the correct order to show the sequence of stages in meiosis I.

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(2)

(b) The diploid number of chromosomes in a human cell is 46. State the number of chromosomes present in each of the following.

(i) A spermatogonium .....

(ii) A spermatid .....

(2)

Leave blank

(c) Describe the process of **oogenesis**.

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(4) **Q8**

(Total 8 marks)

TOTAL FOR PAPER: 60 MARKS

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