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

Paper Reference(s)

6102/01

Edexcel GCE

Biology

Advanced Subsidiary

Unit Test 2B

Thursday 8 January 2009 – 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 EIGHT questions in the spaces provided in this booklet.
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)**.
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 account of meiosis and fertilisation, then write the most appropriate word or words on the dotted lines to complete the account.

During spermatogenesis, a diploid cell called a .....

divides in meiosis I to form two .....

Each of these then divides in meiosis II, forming four haploid

....., which mature into spermatozoa.

The random fusion of gametes during fertilisation is one way in which

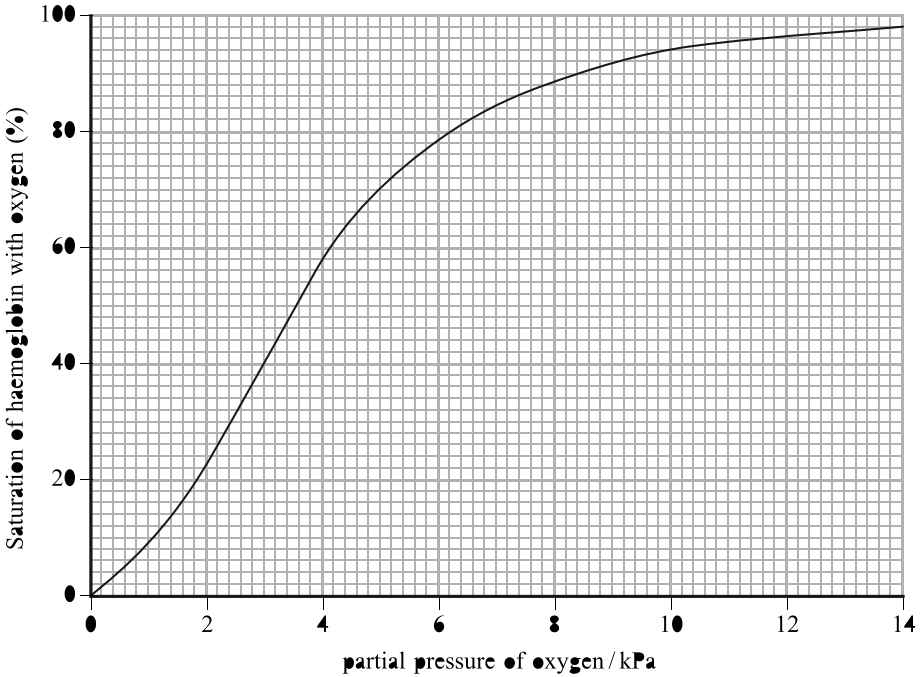
..... variation is increased.

Q1

(Total 4 marks)

Leave blank

2. (a) The graph below shows the oxygen dissociation curve for adult human haemoglobin.



Using the graph, find the partial pressure of oxygen at which the haemoglobin is 90% saturated with oxygen.

..... kPa
(1)

(b) Give **three** ways in which carbon dioxide is transported in the blood.

1 .....

2 .....

3 .....
(3)

Leave blank

(c) Describe the role of **myoglobin**.

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(3)

Q2

(Total 7 marks)

Leave blank

3. (a) Describe the roles of each of the following hormones.

(i) Oestrogen

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(2)

(ii) Prolactin

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(2)

Leave blank

(b) The table below shows the concentration of progesterone in the blood during the first 32 weeks of pregnancy.

Time / weeks	Concentration of progesterone in the blood / arbitrary units
0	7
4	8
8	9
16	11
24	15
32	30

(i) Using the table, describe the changes in the concentration of progesterone during the first 32 weeks of pregnancy.

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(2)

(ii) Suggest why it is important that these changes occur during pregnancy.

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(1) **Q3**

(Total 7 marks)

Leave blank

4. (a) When food is chewed, it is mixed with saliva. Saliva contains amylase, water and mucus. Describe the functions of water and mucus in saliva.

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(2)

(b) The table below refers to the digestion of three carbohydrate substrates: starch, sucrose and lactose. Complete the table by writing the most appropriate word or words in the empty boxes.

Carbohydrate substrate	Enzyme	Product(s)
Starch	Amylase	
Sucrose	Sucrase	
Lactose		

(4)

Leave blank

(c) Describe how the structure of the ileum is adapted for the absorption of monosaccharides.

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(3)

(d) Suggest why disaccharides, such as sucrose and lactose, are not absorbed in the ileum.

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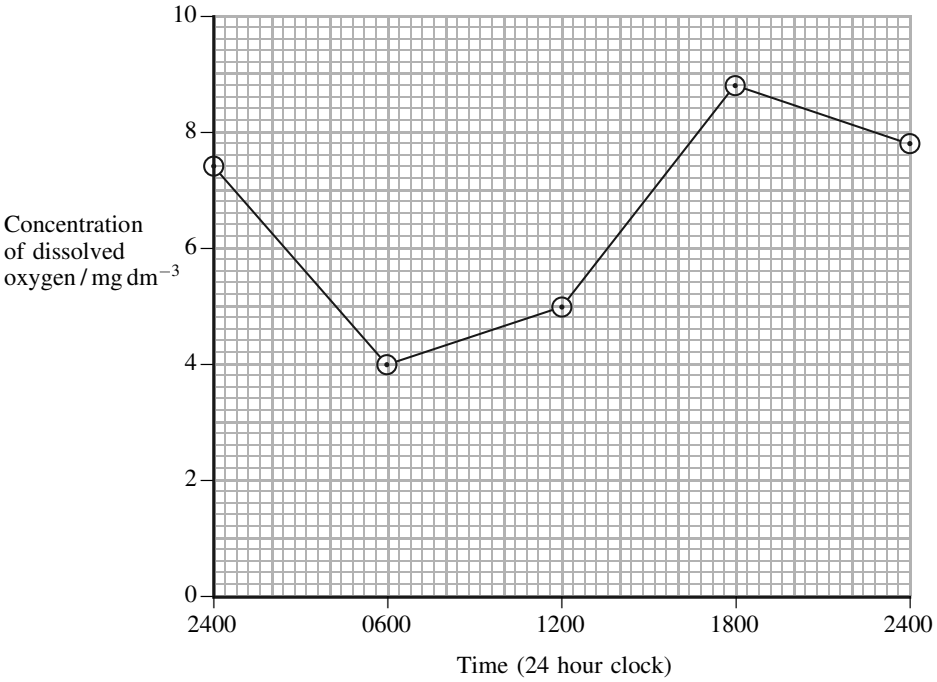
(1)

Q4

(Total 10 marks)

Leave blank

5. (a) The graph below shows changes in the concentration of dissolved oxygen, over a period of 24 hours, in the surface water of a lake.



(i) Using the graph, describe the changes in the concentration of dissolved oxygen in the lake.

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(2)

Leave blank

(ii) Suggest an explanation for the change in the concentration of dissolved oxygen between the hours of 0600 and 1800.

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(2)

(b) *Chironomus* larvae live in the silt at the bottom of ponds and lakes, where there is a low concentration of oxygen. Suggest how each of the following features enables *Chironomus* larvae to live in conditions of low oxygen concentration.

(i) Presence of external gills

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(2)

(ii) Presence of a respiratory pigment

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(2) **Q5**

(Total 8 marks)

Leave blank

6. (a) Explain how each of the following features of a wind-pollinated flower is an adaptation to wind pollination.

(i) Production of large quantities of light pollen grains

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(2)

(ii) Presence of branched and feathery stigmas

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(2)

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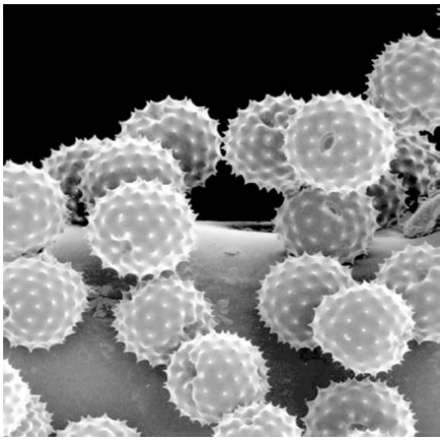
(b) The photograph below shows pollen grains, as seen using an electron microscope.



Magnification × 1000

Suggest whether these pollen grains are from an insect-pollinated flower or a wind-pollinated flower, giving an explanation for your answer.

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(3)

Q6

(Total 7 marks)

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7. (a) Describe a method to determine the mean number of stomata per unit area in the lower epidermis of a leaf.

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(4)

(b) The table below shows the mean numbers of stomata per mm^2 in the upper epidermis and in the lower epidermis of leaves from three different species of plants.

Type of plant	Mean number of stomata per mm^2	
	Upper epidermis	Lower epidermis
Sunflower	120	175
Tobacco	50	190
Castor oil	182	270

(i) Compare the mean numbers of stomata in the upper epidermis of these three plants.

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(2)

Leave blank

(ii) Using the data in the table, suggest which type of plant is least well-adapted to growing in dry conditions. Give an explanation for your answer.

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(3) **Q7**

(Total 9 marks)

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8. (a) Explain what is meant by the term **implantation**.

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(2)

(b) Describe the roles of the placenta.

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(4)

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(c) The table below shows changes in the permeability of the placenta during pregnancy. Permeability is expressed as a percentage of the maximum permeability.

Duration of pregnancy / weeks	Permeability of placenta as percentage of maximum (%)
8	2
12	10
20	25
24	50
28	75
32	90

Suggest explanations for the change in permeability of the placenta as shown in the table.

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(2) **Q8**

(Total 8 marks)

TOTAL FOR PAPER: 60 MARKS

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