Centre No.			Paper Reference					Surname	Initial(s)		
Candidate No.			6	1	0	6	/	0	3	Signature	

6106/03 **Edexcel GCE Biology Biology (Human) Advanced**

Unit Test 6 Paper 03 Synoptic Paper Monday 29 January 2007 – Afternoon Time: 1 hour 10 minutes

Materials required for examination	Items included with question papers
Ruler	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and

Check that you have the correct question paper.

Answer Questions 1 and 2 and then either Question 3 or either 4B or 5H 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). The total mark for this paper is 38.

There are 20 pages in this question paper. All blank pages are indicated.

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. This question paper is designed to give you the opportunity to make connections between different areas of biology and to use skills and ideas developed throughout the course in new contexts. You should include in your answers any relevant information from the whole of your course.

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Examiner's use only

Team Leader's use only

Question Number

1

2

3

4B

5H

Turn over

Total



Leave blank

Answer Questions 1 and 2 in the spaces provided.

	a relative molecular mass of 5500 and has been used to investigate kidney function lin is inert and is filtered out of the plasma in the glomerular capillaries.								
(a)	Name each of the following.								
	(i) The type of reaction involved when fructose monomers join to form inulin.								
	(1								
	(ii) The type of bond formed between fructose monomers.								
	(1								
(b)	Describe the process of glomerular filtration (ultrafiltration).								
	(3								
(c)	Suggest why the polysaccharide inulin is freely filtered out of the glomerula capillaries.								

Leave blank

(d) Studies have shown that it is possible to determine the rate of formation of glomerular filtrate. This can be determined by dividing the concentration of inulin in the urine by the concentration of inulin in the plasma, and multiplying this by the rate of formation of urine.

This is shown by the formula below.

Rate of formation of glomerular filtrate
$$=\frac{U}{P} \times V$$

Where U = concentration of inulin in the urine

P = concentration of inulin in the plasma

V = rate of formation of urine.

In an investigation, U, V and P were measured. The values are shown in the table below.

U	125.0 mg cm ⁻³
P	2.0 mg cm ⁻³
V	2.0 cm ³ min ⁻¹

Use the formula above to calculate the rate of formation of glomerular filtrate. Show your working.

(2) Q1

2. Cassava (*Manihot esculenta*) is an important crop plant, which is grown in many tropical and subtropical areas of the world.



Cassava

The roots of cassava provide an important source of starch and starch-based products. The leaves may also be eaten as they provide protein and vitamins A and B.

(a) Cassava is usually propagated using stem cuttings, rather than seeds. This is a form of cloning.

Suggest advantages of propagating cassava by stem cuttings rather than by seeds.
(2)

(i)	Suggest why green mites are considered to be pests of cassava.
(1)	Suggest wify green filtes are considered to be pests of cassava.
(ii)	Suggest advantages of the use of biological, rather than chemical methods, control green mites.
(ii)	Suggest advantages of the use of biological, rather than chemical methods,
(ii)	Suggest advantages of the use of biological, rather than chemical methods,
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(ii)	Suggest advantages of the use of biological, rather than chemical methods,

(c) An investigation was carried out to evaluate different species of predatory mites as biological control agents of green mites. Two different species of predatory mites *T. aripo* and *G. annectens* were used. Each species of predatory mite was placed in a dish containing a cassava leaf disc on which there were a known number of green mite eggs. The dishes were kept under carefully controlled conditions. After 24 hours, the numbers of eggs eaten by each predatory mite were counted and the means calculated.

The results of this investigation are shown in the table below.

Number of green	Mean number of eggs eaten by predatory mites						
mite eggs	T. aripo	G. annectens					
1	0.93	1.00 2.53 6.20					
3	2.90						
7	6.83						
15	14.94	11.31					
30	28.60	15.53					
105	81.30	18.10					
200	101.31	11.50					

(i)	Suggest why investigation.	the	dishes	were	kept	at	a	constant	temperature	during	this
		•••••	•••••	•••••	•••••						
			•••••							•••••	(2)
											ν-/



	(2
1	From the results of this investigation, which species of predatory mite seems to be the more effective as a biological control agent? Give an explanation for you answer.
	(3
	(Total 15 marks)

Leave blank

Write an essay on ONE of the following topics.
Put a cross in the box below indicating the question you have chosen (\boxtimes). If you change your mind, put a line through the box (\boxtimes) and then put a cross in the other box (\boxtimes).
Chosen question number: Question 3
Question 4B
Question 5H
For Biology you should choose EITHER Question 3 OR Question 4B.
3. The structure and functions of liver cells. (15 marks)
4B. Pigments and their roles in flowering plants. (15 marks)
For Biology (Human) you should choose EITHER Question 3 OR Question 5H
3. The structure and functions of liver cells. (15 marks)
5H. Meiosis, genetic variation and chromosome mutations. (15 marks)
Marks will be awarded for scientific content, coverage of the topic, and the quality of written communication. You should include in your answer any relevant information from the whole of your course. You may include diagrams if you wish, but make sure that they are relevant to your essay and add extra information to it.
Write your answer, including any plan, here.



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(Total 15 marks)	
TOTAL FOR PAPER: 38 MARKS	
END	





