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

Paper Reference(s)

6101/01

Edexcel GCE

Biology

Biology (Human)

Advanced Subsidiary

Unit Test 1

Monday 4 June 2007 – 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 question 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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Leave blank

Answer ALL questions in the spaces provided.

1. The table below refers to structures that may be found in bacterial cells or liver cells. Place a tick (✓) in the box if the structure is found in the cell and a cross (✗) in the box if it is not.

Structure	Bacterial cell	Liver cell
Ribosomes		
Centrioles		
Starch grains		
Nucleus		

Q1

(Total 4 marks)

2. Read through the following passage about lipids, then write on the dotted lines the most appropriate word or words to complete the passage.

Lipids contain the elements hydrogen, carbon and oxygen joined together

by ..... bonds.

Triglycerides are lipids that consist of three ..... molecules

joined to a ..... molecule. These molecules are joined together

by a chemical process called a ..... reaction.

Triglycerides that have double bonds between carbon atoms are known

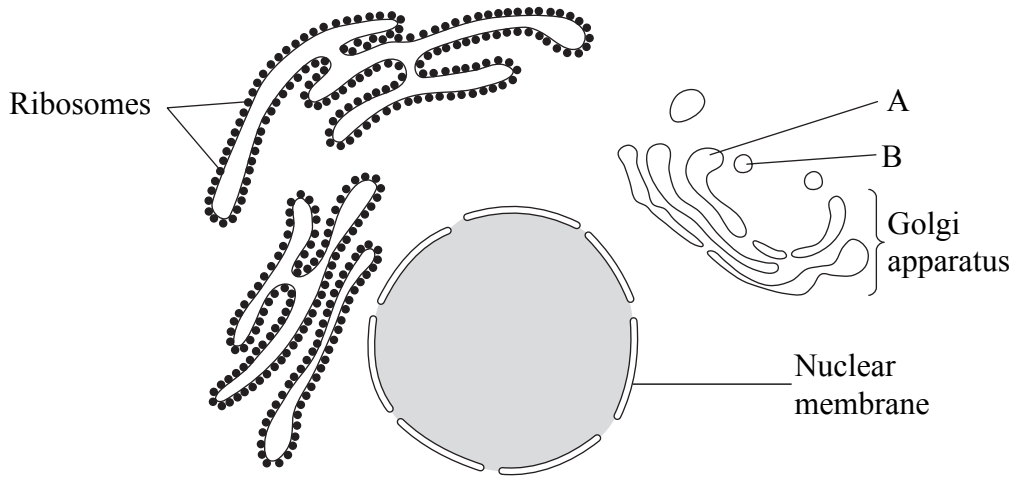
as ..... triglycerides.

Q2

(Total 5 marks)

Leave blank

3. The diagram below shows some of the organelles found in a eukaryotic cell.



(a) Name the parts of the Golgi apparatus labelled A and B.

A .....

B .....

(2)

(b) Some of the proteins synthesised by ribosomes are transported to the Golgi apparatus.

Describe what happens to these proteins in the Golgi apparatus.

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Q3

(Total 5 marks)

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4. A student was given three unknown, colourless carbohydrate solutions labelled A, B and C. She tested each one by heating it with Benedict's reagent. The table below shows her results.

Solution	Appearance after heating with Benedict's reagent
A	Red precipitate
B	Green precipitate
C	Blue solution

(a) State **two** conclusions that can be made about solutions A and B.

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(b) Describe the process that the student would now need to carry out in order to show that solution C contained a non-reducing sugar.

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Q4

(Total 5 marks)

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5. The tips of three onion roots were cut off and each was used to make a root tip squash.

(a) Name a suitable stain that can be used to show chromosomes in a root tip squash.

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(1)

(b) The number of cells observed in each phase of mitosis was counted and these results are shown in the table below.

Root tip	Number of cells observed			
	Prophase	Metaphase	Anaphase	Telophase
1	15	5	3	5
2	23	5	4	9
3	17	6	2	8

The number of cells observed in a phase is directly proportional to the length of that phase. Using these results, put the phases in order starting with the longest phase and ending with the shortest phase.

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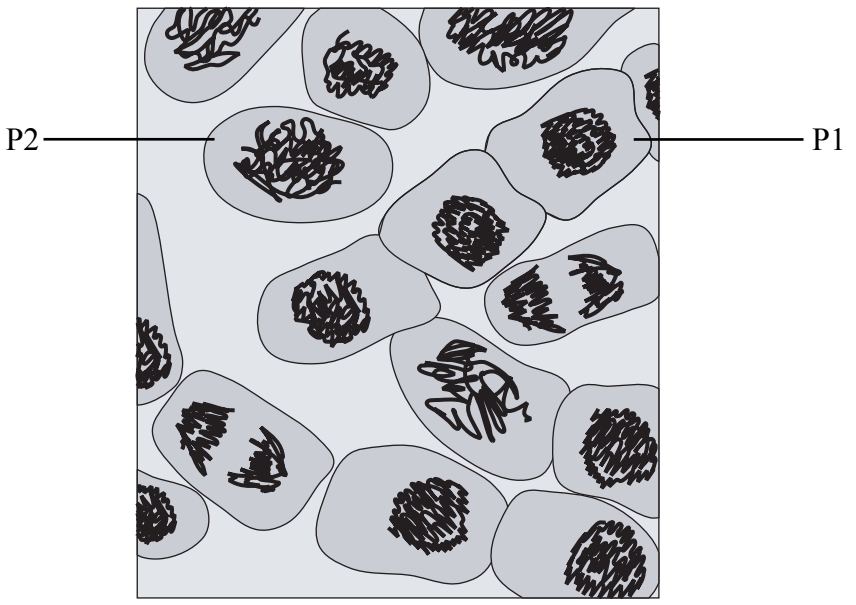
(1)

(c) The appearance of the chromosomes from part of a root tip squash is shown below.



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(i) The cells labelled P1 and P2 are both in prophase. Suggest an explanation for the difference in appearance between the two cells.

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(ii) Write the letter A on the illustration to label a cell that is undergoing anaphase.

(1)

(iii) Describe what happens during anaphase.

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(2)

Q5

(Total 8 marks)

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6. (a) Describe the roles of protein molecules in facilitated diffusion and active transport.

Facilitated diffusion .....

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Active transport .....

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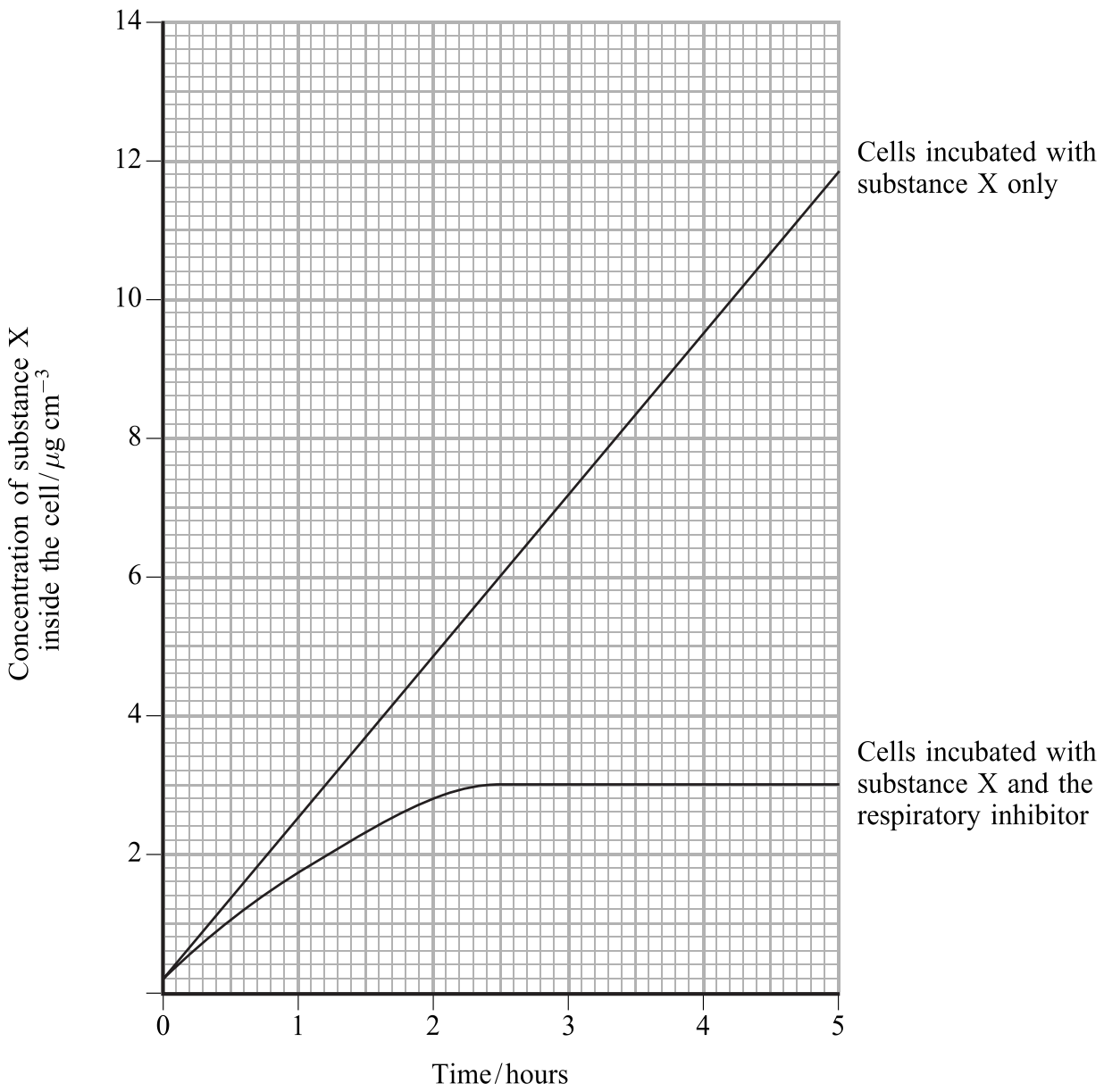
(b) Experiments were carried out to compare the uptake by cells of a substance (substance X) in the presence and absence of a respiratory inhibitor. A respiratory inhibitor is a substance that prevents the formation of ATP.

In each experiment the cells were incubated in a solution of substance X for five hours. The concentration of substance X in the cytoplasm was measured throughout.

The graph below shows the changes in the concentration of substance X in the cell cytoplasm during the experiments.



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(i) Describe the changes in the concentration of substance X in the cytoplasm of the cells incubated with the respiratory inhibitor present, during the five hours of the experiments.

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(ii) Suggest an explanation for the changes you have described.

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(2) **Q6**

(Total 9 marks)

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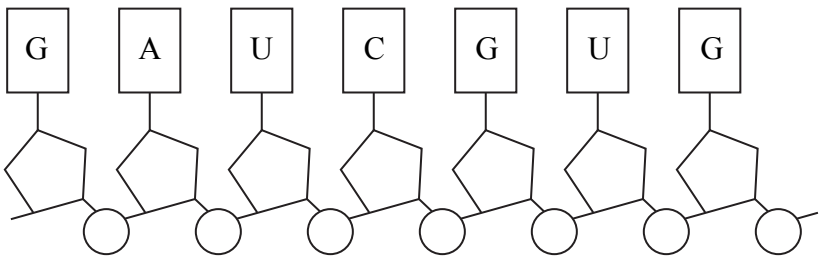
7. (a) Protein synthesis involves the process of transcription followed by translation. The diagram below shows part of a messenger RNA (mRNA) molecule. It shows a sequence of seven bases.



(i) Name the pyrimidine bases shown in this sequence.

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(1)

(ii) Write down the sequence of bases on the strand of DNA that coded for this messenger RNA.

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(1)

(b) In some prokaryotic cells, the production of mRNA during transcription can occur at a rate of 50 bases per second. Calculate how long it would take to produce a mRNA molecule that coded for a protein containing 200 amino acids. Show your working.

Answer .....

(3)

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

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(d) In prokaryotic cells, a molecule of mRNA can be translated as soon as it is made. Suggest an explanation for this.

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Q7

(Total 12 marks)

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8. (a) Describe the role of **proteases** in biological detergents.

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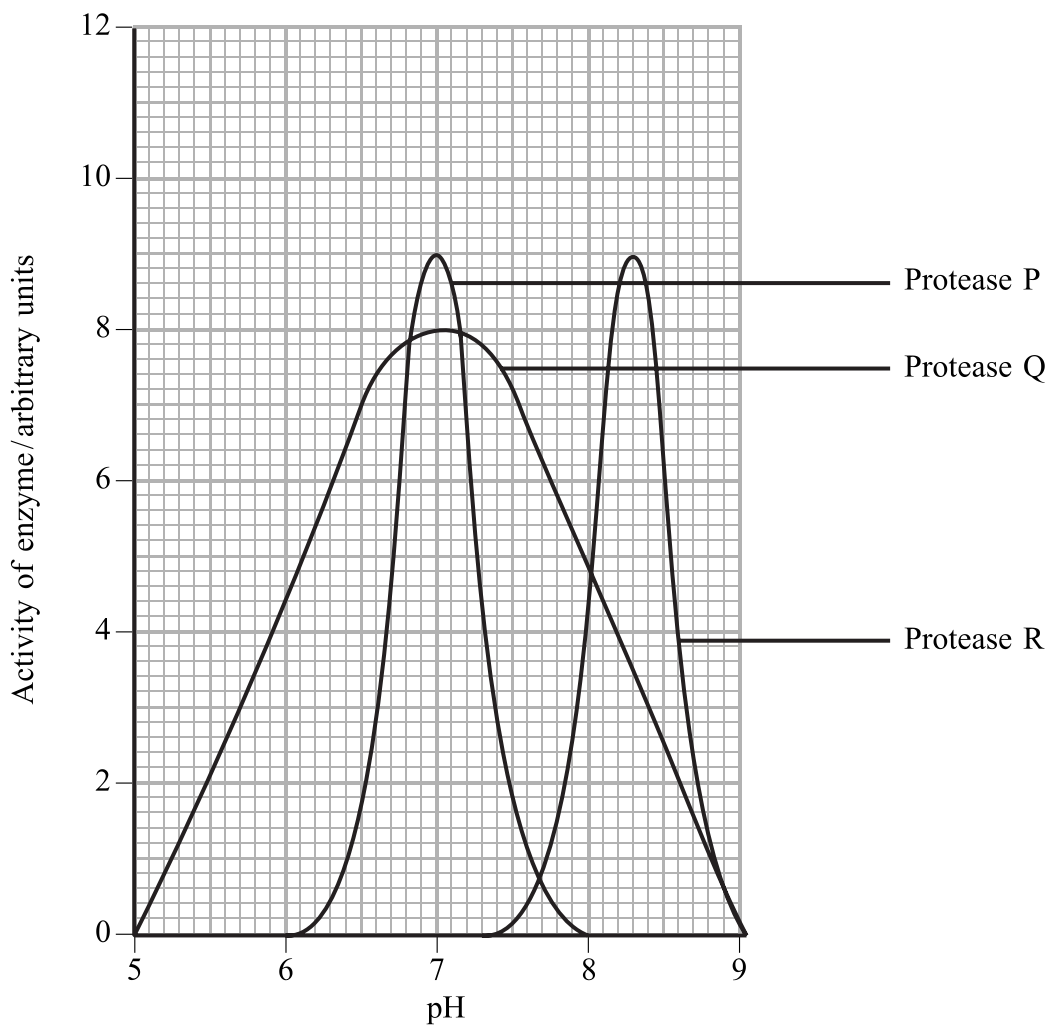
(2)

(b) The graph below shows the effect of pH on the activity of three protease enzymes (Protease P, Protease Q and Protease R).

Proteases P and Q will remove blood stains and Protease R will remove egg stains.



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(i) Compare the effect of pH on the activities of Protease P and Protease Q.

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(ii) Using the information in the graph, suggest which **two** enzymes should be used in a detergent that removes **both** egg and blood stains. Give an explanation for your answer.

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QUESTION 8 CONTINUES ON THE NEXT PAGE

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(c) Explain how pH affects the activity of enzymes.

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(4)

Q8

(Total 12 marks)

TOTAL FOR PAPER: 60 MARKS

END