Write your name here

Surname	Other names

Pearson Edexcel
International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Human Biology

Unit: 4HB0
Paper: 02

Tuesday 17 January 2017 – Afternoon
Time: 1 hour

Paper Reference
4HB0/02

You must have:
Ruler
Calculator

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Answer ALL questions.

1 Descriptions of processes occurring in the human body are given in boxes on the left-hand side and the names of the processes are given in boxes on the right-hand side.

Draw a line from the description of a process to the correct name of that process.

Each name may be used once or more than once.

(7)

Description of process	Name of process
removal of faeces	sweating
removal of urine	egestion
removal of water onto the skin surface	excretion
removal of carbon dioxide during expiration	digestion
conversion of glucose produced during digestion into glycogen in the liver	assimilation
conversion of proteins into polypeptides in the stomach	secretion
passage of insulin into the blood from the pancreas	

(Total for Question 1 = 7 marks)

2 (a) The box lists parts of the eye.

lens	retina	aqueous humor	cornea	vitreous humor
	choroid	optic nerve	iris	ciliary body

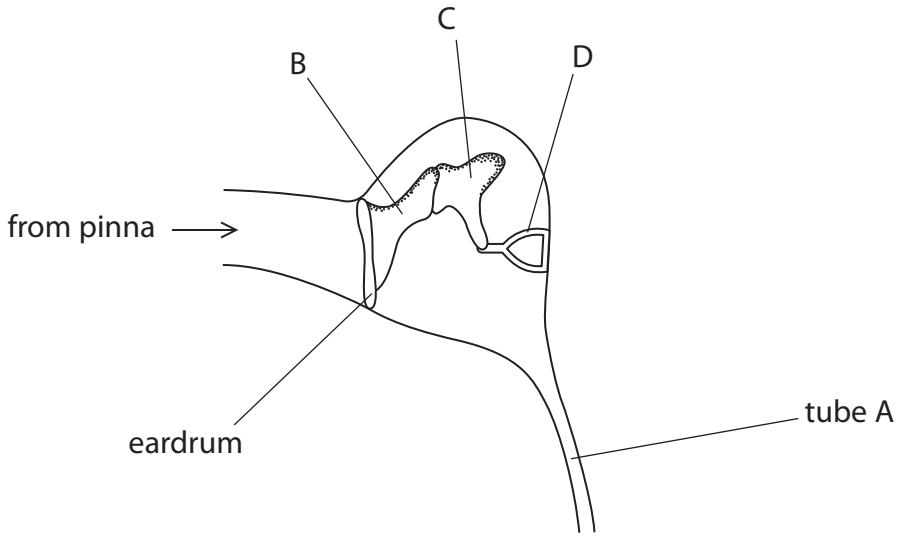
Complete the table by writing in the part of the eye that matches the description.

Each part may be used once, more than once or not at all.

Description	Part
prevents internal reflection	
light sensitive layer	
bends light as it enters the eye	
carries impulses to the brain	
contains muscles that help to focus images	
watery fluid at the front of the eye	

(6)

(b) The diagram shows part of the ear.



(i) Name the part of the ear that contains structures B, C and D.

(1)

.....

(ii) Structures B, C and D are all made of the same material.

Name the material.

(1)

.....

(iii) Describe the function of structures B, C and D in the hearing process.

(3)

(c) Tube A sometimes becomes blocked. The cells lining the part of the ear shown in the diagram absorb oxygen from the air in the chamber.

Explain how the hearing process may be affected if tube A becomes blocked.

(3)

(Total for Question 2 = 14 marks)

3 (a) Ten students carry out an investigation to determine the speed at which a nerve impulse travels.

- they form a circle holding hands
- the first student starts a timer with his left hand
- using his right hand, he squeezes the left hand of the second student
- this continues until student number 10 has his left hand squeezed by student number 9
- student number 10 stops the timer with his right hand
- the distance the nerve impulse travels in each student is measured and the results recorded in the table.

Student number	1	2	3	4	5	6	7	8	9	10
Distance travelled by nerve impulse in each student in cm	198	220	175	189	207	190	167	168	176	210

(i) Suggest how the distance travelled by the nerve impulse in each student is measured.

(3)

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(ii) Calculate the total distance travelled by the nerve impulse through all ten students.

(1)

distance travelled = ... cm

(iii) The time recorded on the timer for the nerve impulse to travel through the whole circle of students is 2.5 s.

Calculate the speed at which the nerve impulse travels.

(3)

speed = ... cm/s

(iv) Suggest three reasons why the results from this investigation may not be accurate.

(3)

1 .....

2 .....

3 .....

(b) Explain how alcohol affects the speed of nerve impulses.

(2)

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(Total for Question 3 = 12 marks)

4 Describe the harmful effects of smoking on the lungs and the process of respiration.

(8)

(Total for Question 4 = 8 marks)

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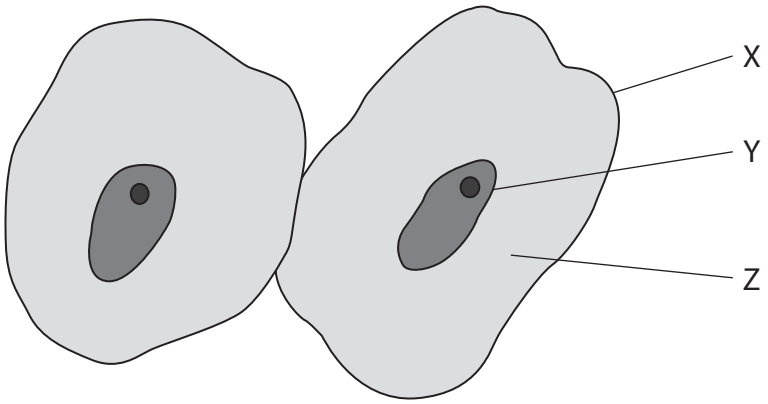
5 (a) The diagram shows two cheek cells from the inside of the mouth.



(i) Complete the table for parts X, Y and Z.

Part	Name of part	Function of part
X		
Y		
Z		

(3)

(ii) Name three other structures that can be seen when the cells are viewed through an electron microscope.

(3)

1 .....

2 .....

3 .....

(b) Cheek cells are a type of epithelium found in the mouth. Ciliated epithelium is found in other areas of the body.

(i) Draw a labelled diagram to show two ciliated epithelial cells.

(2)

(ii) Describe a function of ciliated epithelium.

(2)

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(Total for Question 5 = 10 marks)

6 (a) Doctors often look at the chromosomes of a developing fetus to see if there are any genetic abnormalities.

They take cells from the fetus and place them in a solution containing oxygen.

They then place the cells onto a microscope slide and add a stain.

(i) Explain what must be occurring in the cells if their chromosomes are to be seen.

(2)

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(ii) Suggest why oxygen must be present in the solution that the cells are placed into.

(2)

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(iii) Suggest why a stain is added to the cells.

(1)

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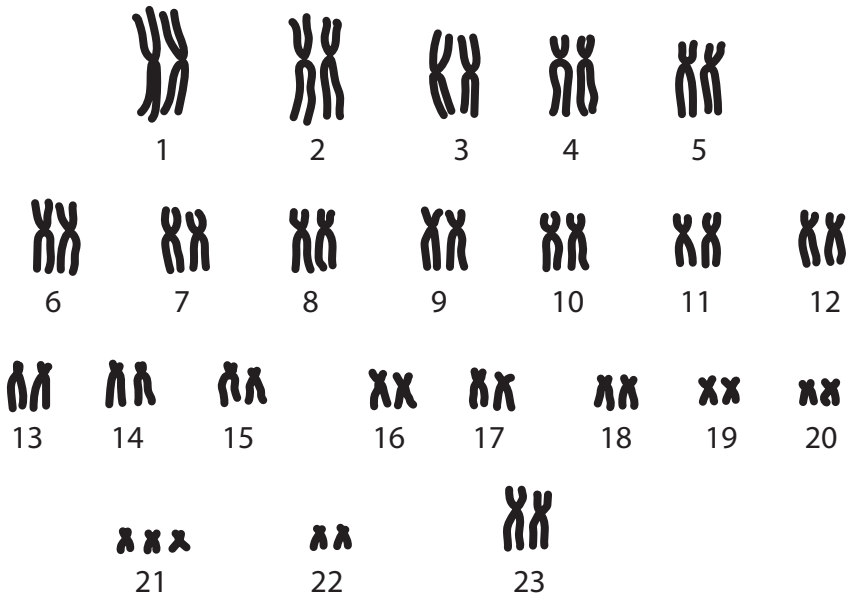
(b) The diagram shows the chromosomes found in one cell.

The cell is taken from a person who has the condition known as Down's syndrome.



(i) Use the diagram to determine the number of chromosomes for this person.

(1)

number of chromosomes = ...

(ii) Chromosome pair 23 are the chromosomes that determine the sex of the person.

State why it is possible to tell that this person is female.

(1)

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.....

(iii) Suggest why gamete production in people with Down's syndrome is low.

(2)

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(Total for Question 6 = 9 marks)

TOTAL FOR PAPER = 60 MARKS

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