

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel  
International GCSE (9–1)**

Centre Number

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Candidate Number

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Sample Assessment Material for first teaching September 2017

(Time: 1 hour 45 minutes)

Paper Reference **4HB1/01**

**Human Biology**

**Unit 4HB1**

**Paper 01**

**You must have:**

Calculator, ruler

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.*
- Calculators may be used.
- Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

## Information

- The total mark for this paper is 90.
- 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** The table gives the description of different substances.

Complete the table by giving the correct substance from the list.

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

(7)

ADH      amniotic fluid      cholesterol      fibrinogen      glucagon  
glycogen      haemoglobin      insulin      oestrogen      thyroxine

Description	Substance
involved in blood clotting	
protects developing fetus	
is a storage form of glucose	
controls the metabolic rate of the body	
causes a rise in blood glucose levels	
found in red blood cells	
its level in blood rises before ovulation	

**(Total for Question 1 = 7 marks)**



- 2 On day 1 of an investigation into urine production, a student rapidly drinks 1 dm<sup>3</sup> of water. He then collects and measures the volume of his urine every 30 minutes for four hours. The air temperature on day 1 is 20 °C.
- The student repeats the experiment on day 2, when the air temperature is 35 °C.

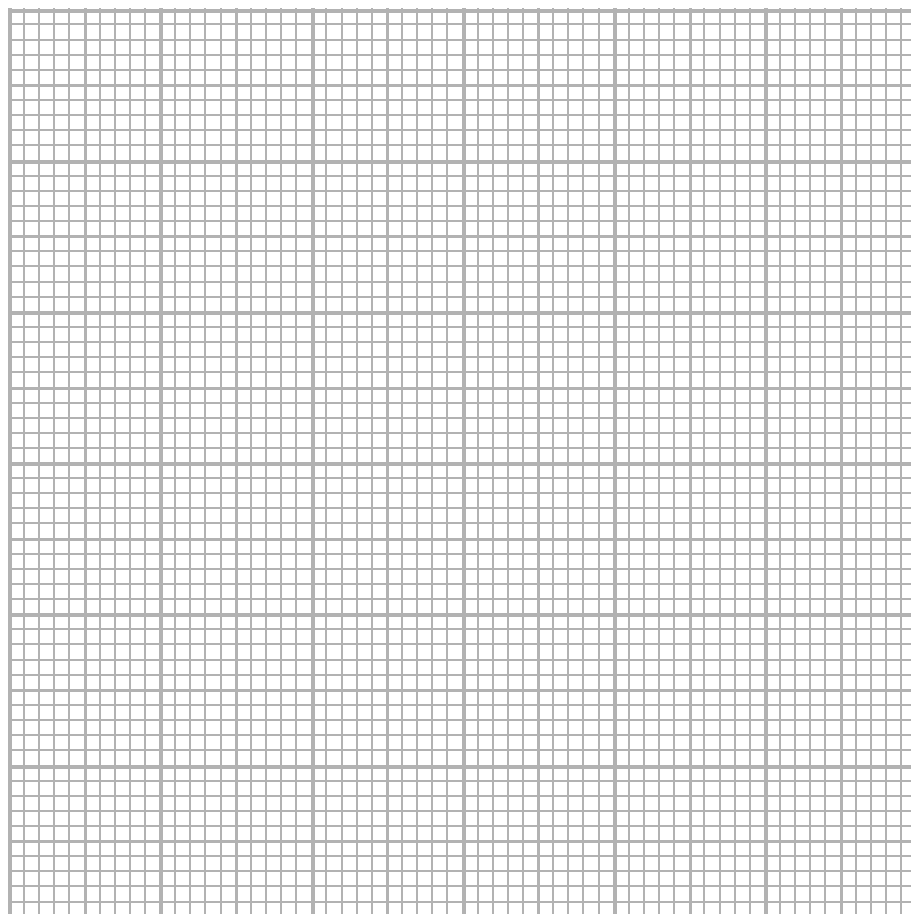
Time after drinking in minutes	Volume of urine produced in cm <sup>3</sup>	
	day 1	day 2
30	70	50
90	180	120
120	300	200
150	250	190
180	200	150
210	100	50
240	75	50



(a) Draw a line graph of the results.

Join the points with straight lines.

(6)



(b) Describe the overall trends shown by both sets of results.

(2)

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(c) Explain why the results for day 1 and day 2 are different.

(4)

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(Total for Question 2 = 12 marks)

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S 6 0 1 2 7 A 0 7 2 4

**3** Lipids are large molecules that are found in cells.

(a) Name the two components of a lipid.

(2)

..... and .....

(b) Describe a test to show if there is lipid present in a piece of food.

(4)

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(c) Bile salts produced in the liver emulsify lipids before they are digested.

(i) Name the enzyme that digests lipids in the gut.

(1)

- ☐ **A** carbohydrase
- ☐ **B** lipase
- ☐ **C** maltase
- ☐ **D** protease

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(ii) Explain why it is an advantage for lipids to be emulsified before digestion.

(3)

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(d) Describe an experiment to show that bile salts are effective in emulsifying lipids.

(5)

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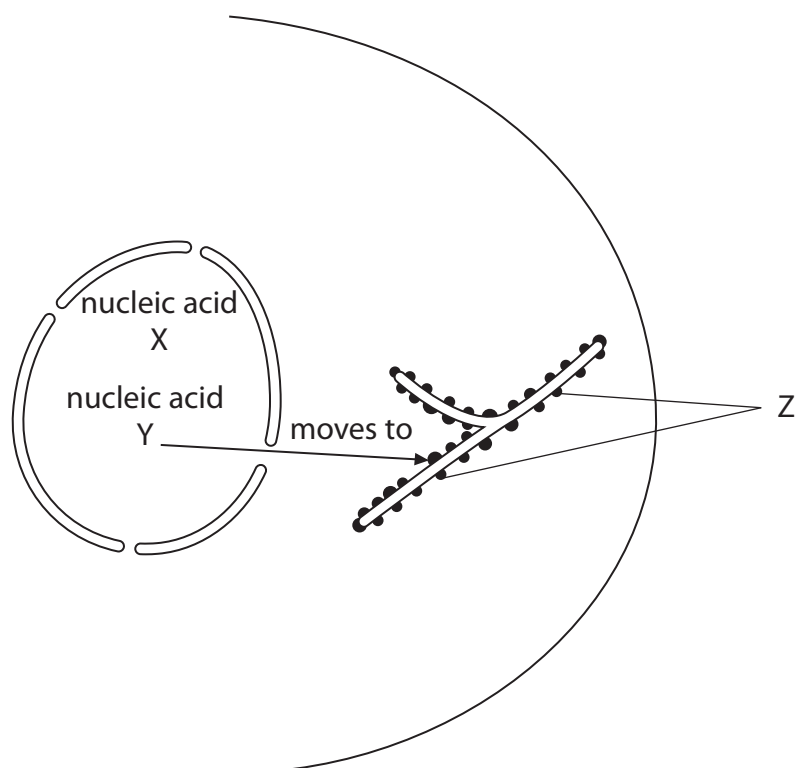
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(Total for Question 3 = 15 marks)



S 6 0 1 2 7 A 0 9 2 4

- 4 (a) The diagram shows two types of nucleic acid found in the nucleus of a cell.



- (i) What is the name of nucleic acid X?

(1)

- ☐ A DNA
- ☐ B mRNA
- ☐ C rRNA
- ☐ D tRNA

- (ii) What is the name of nucleic acid Y?

(1)

- ☐ A DNA
- ☐ B mRNA
- ☐ C rRNA
- ☐ D tRNA



(iii) Explain why nucleic acid X cannot move out of the nucleus.

(2)

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(iv) State three structural differences between nucleic acid X and nucleic acid Y.

(3)

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2 .....

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(b) Describe the functions of the nucleic acids X and Y and the structures labelled Z.

(4)

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(Total for Question 4 = 11 marks)

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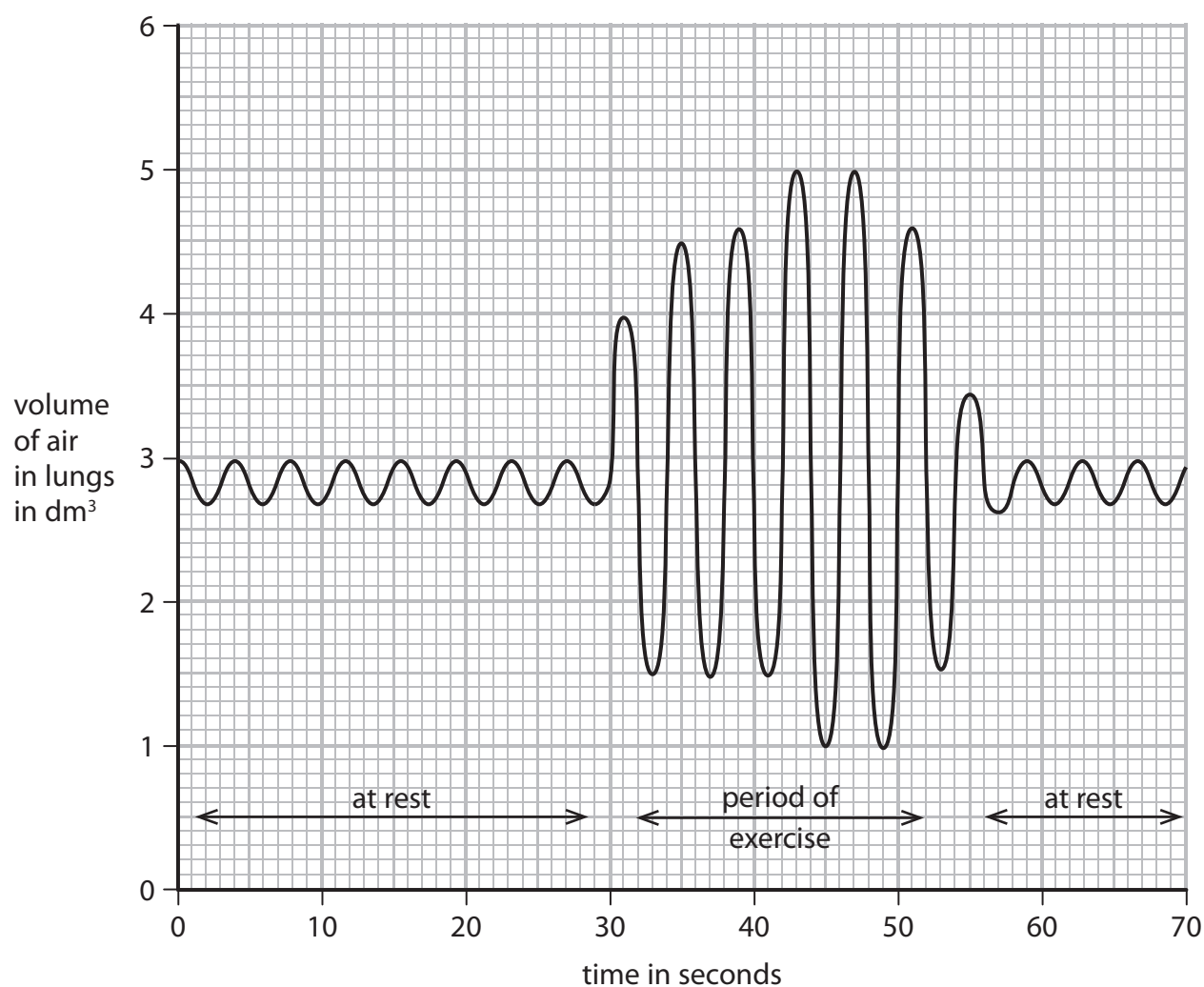


5 The rate and depth of breathing can vary.

(a) Name a piece of apparatus that can measure the rate and depth of breathing.

(1)

(b) The graph shows the rate and depth of breathing of a person at rest and during exercise.



- (i) Use data from the graph to calculate the rate of breathing at rest.

Give your answer in breaths per minute.

(2)

rate of breathing = ..... breaths per minute

- (ii) The mean tidal volume (depth) of breathing at rest is  $0.3 \text{ dm}^3$ .

Calculate the mean tidal volume of breathing between 35 and 45 seconds.

(3)

mean tidal volume = .....  $\text{dm}^3$

- (iii) Explain the difference between the tidal volume at rest and during exercise.

(3)

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(iv) Explain why the tidal volume does not return to  $0.3 \text{ dm}^3$  immediately after exercise. (3)

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(c) Describe an experiment to show the difference in the concentration of carbon dioxide in exhaled air at rest and during exercise. (3)

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(Total for Question 5 = 15 marks)



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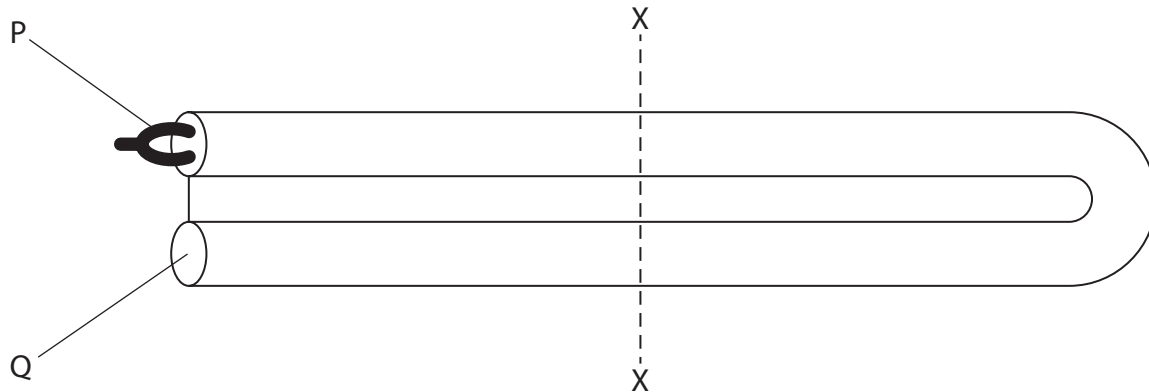


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6 This question is about the structure and function of the ear.

(a) The cochlea forms part of the inner ear.

The diagram shows a model of the cochlea.



(i) Describe how the appearance of the cochlea in the ear is different from its appearance in the diagram.

(1)

(ii) What is the name of structure P?

(1)

- ☐ A incus
- ☐ B round window
- ☐ C stapes
- ☐ D tympanum

(iii) What is the name of structure Q?

(1)

- ☐ A incus
- ☐ B round window
- ☐ C stapes
- ☐ D tympanum





(iv) Describe the function of structure P.

(3)

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(v) Draw a labelled diagram to show the structure of the cochlea at point X, in cross-section.

(4)



S 6 0 1 2 7 A 0 1 7 2 4

- (b) The Eustachian tube connects the middle ear to the back of the throat. This tube can become blocked.

Explain the effect of a blocked Eustachian tube on the function of structure Q.

(3)

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- (c) Exposure to loud noises over a long period of time can lead to permanent deafness.

Describe how exposure to loud noise can cause a person to become deaf.

(2)

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**(Total for Question 6 = 15 marks)**



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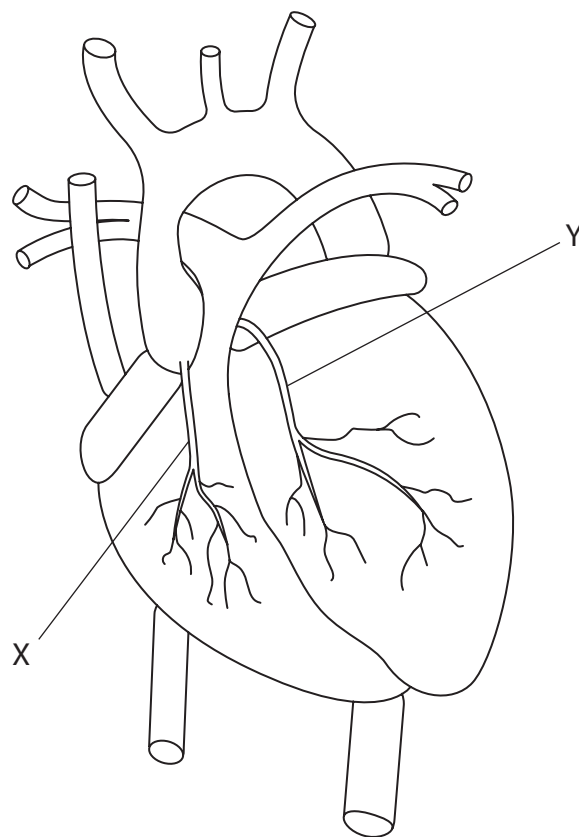
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7 (a) The diagram shows a view of the heart.



Describe the importance of the arteries labelled X and Y to the function of the heart.

(4)

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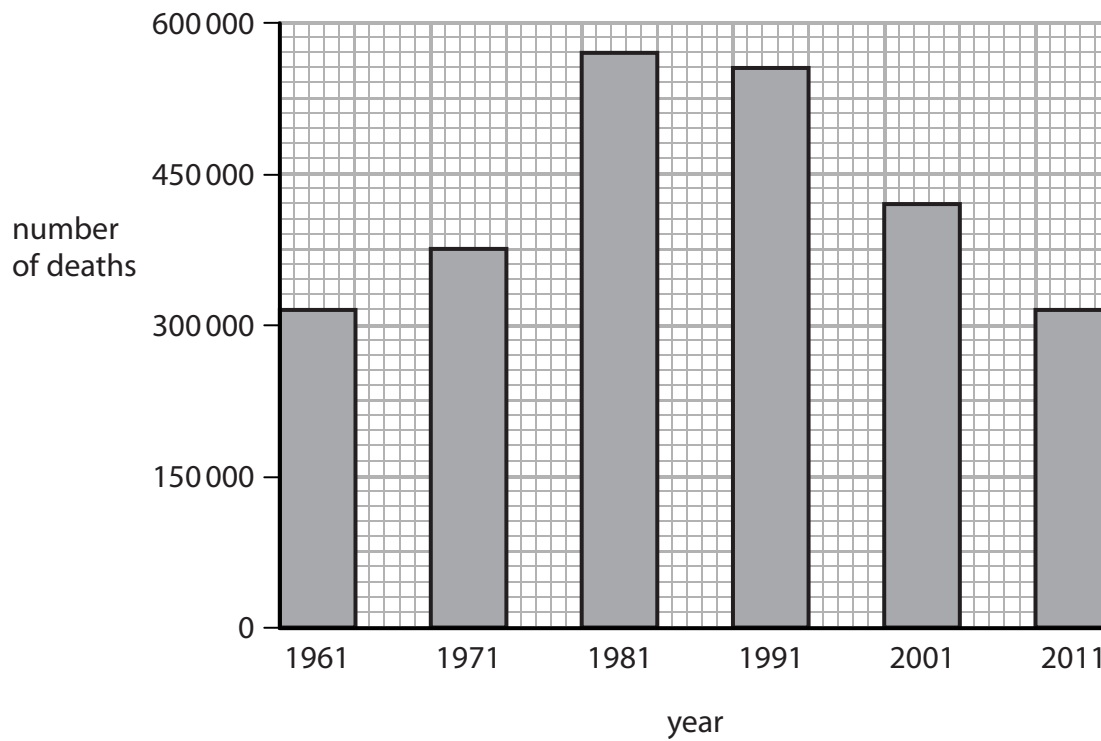
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(b) Cardiovascular disease kills many people each year.

The graph shows the number of deaths from cardiovascular disease in one country from 1961 until 2011.



(i) Describe the trends shown in the data.

(2)



(ii) Discuss the possible changes in lifestyle that could explain these trends.

(4)

(c) Describe how stents are used to reduce the effects of cardiovascular disease.

(5)

(Total for Question 7 = 15 marks)

**TOTAL FOR PAPER = 90 MARKS**



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