Write your name here

Surname	Other names

Pearson Edexcel
International GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Human Biology

Unit: 4HB0
Paper: 02

Tuesday 16 January 2018 – Afternoon
Time: 1 hour

Paper Reference
4HB0/02

You must have:
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.*
- 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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P 5 3 2 9 5 A 0 1 1 6

Pearson

Answer ALL questions.

1 (a) As blood passes through the kidney glomeruli, it is filtered and forms a filtrate. Urine is then formed from the filtrate.

(i) The table lists substances that may be found in blood, filtrate and urine.

Complete the table to show the composition of blood, filtrate and urine in a non-diabetic male.

Put a tick (✓) in each box where the substance is present and a cross (✗) in each box where the substance is absent.

(5)

	Blood	Filtrate	Urine
Protein			
Urea			
Glucose			
Water			
Salts			

(ii) Explain why the composition of the fluids would be different in a diabetic person.

(3)

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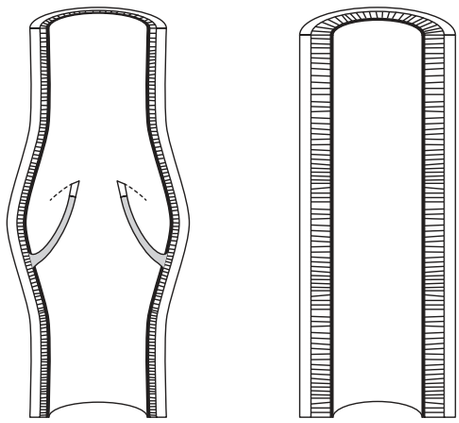
(b) The renal vein carries blood away from the kidney and the renal artery carries blood to the kidney.

Complete the table by giving three differences between the composition of blood in the renal vein and in the renal artery.

(3)

Renal vein	Renal artery

(c) The diagrams show a section through a renal vein and a section through a renal artery that have been labelled by a student.



(i) Draw an arrow on the diagram of the renal vein to show the direction of blood flow.

(1)

(ii) Give three differences between the diagrams which show that the student's labels are correct.

(3)

1 .....

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2 .....

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3 .....

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(Total for Question 1 = 15 marks)

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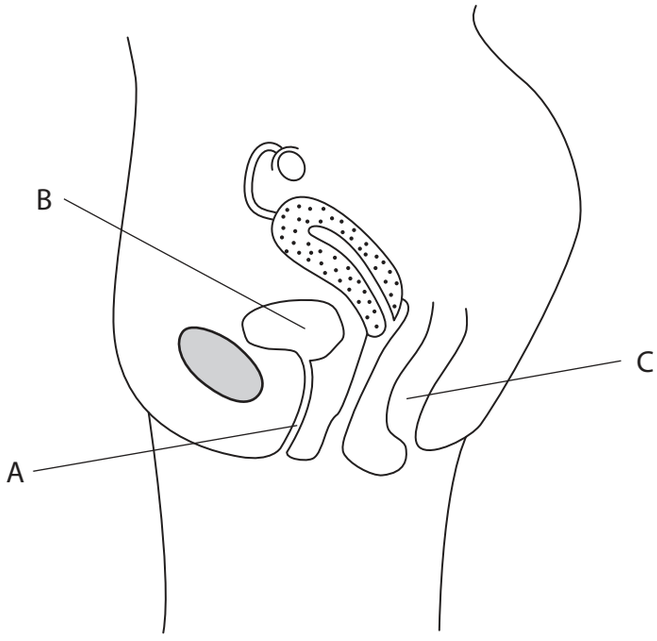
2 (a) The diagram shows a section through part of a female.



(i) Name the structures labelled A, B and C.

(3)

A .....

B .....

C .....

(ii) Add arrows to the diagram to show

- where sperms are deposited during sexual intercourse (P)
- where fertilisation takes place (Q)
- where ova are produced (R)

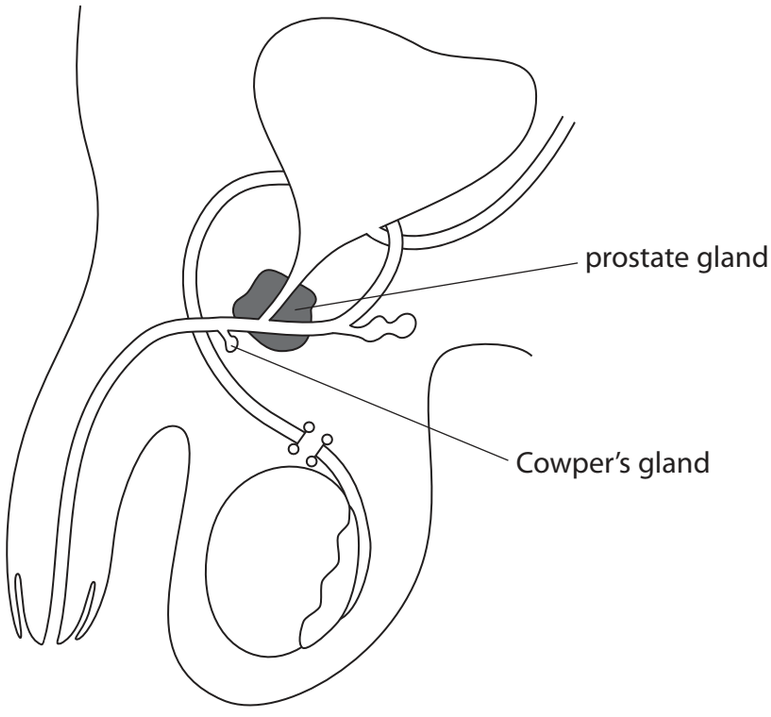
Label your arrows P, Q and R.

(3)

(b) The diagram shows a section through the reproductive organs of a male.

The male has had an operation called a vasectomy.

This operation is a method of contraception.



(i) Write the letter S on the diagram to show where sperms are produced.

(1)

(ii) Explain how a vasectomy can prevent pregnancy.

(3)

(iii) Explain why a vasectomy will not prevent the spread of gonorrhoea.

(2)

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(Total for Question 2 = 12 marks)

3 During the life of a body cell, the amount of genetic material changes.

(a) (i) State where genetic material is found in a body cell.

(1)

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(ii) Name the molecule that contains the genetic information.

(1)

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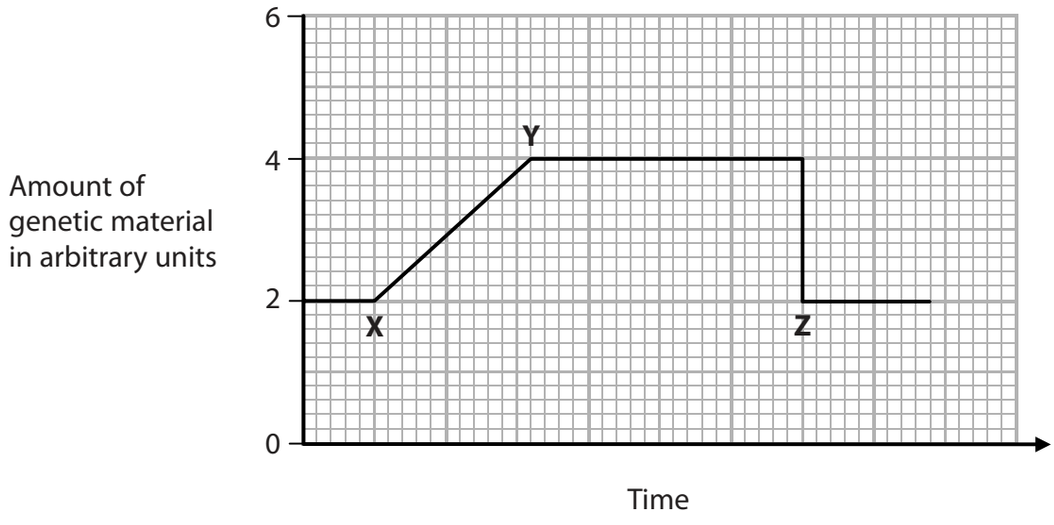
(b) The graph shows the changes in the amount of genetic material in a body cell over a period of time.



(i) Explain the change in the amount of genetic material between X and Y.

(2)

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(ii) Explain the change in the amount of genetic material at Z.

(3)

(iii) The production of gametes differs from the production of body cells.

Extend the line on the graph to show the change in the amount of genetic material during the production of a gamete.

(3)

(iv) Explain the line you have drawn.

Refer to the production of gametes in your answer.

(2)

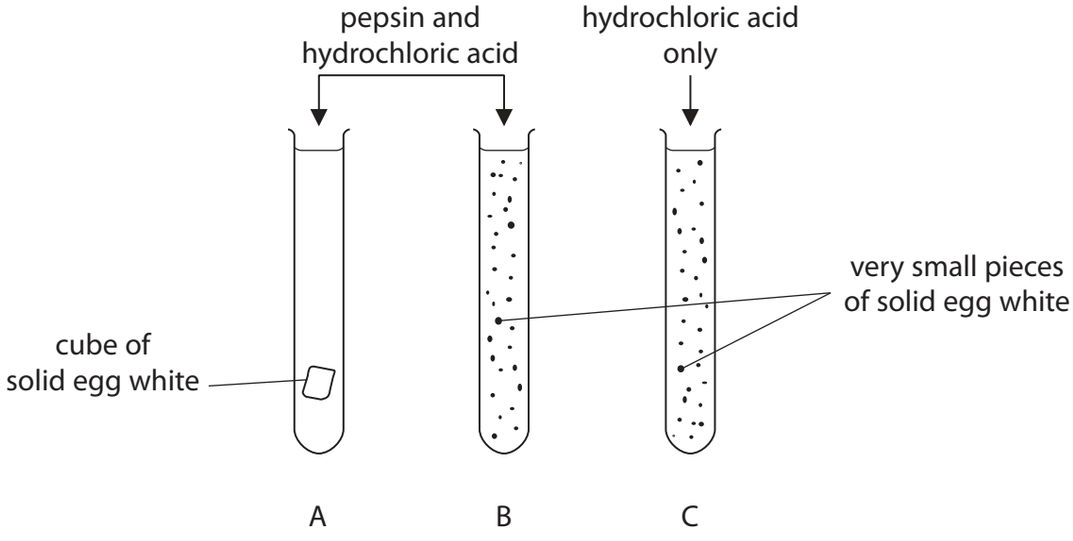
(Total for Question 3 = 12 marks)

4 A student investigates the effect of the enzyme pepsin on solid egg white (protein).

This is the student's method.

- place a 1g cube of solid egg white in tube A
- place 1g of very small pieces of solid egg white in each of tubes B and C
- add pepsin to tubes A and B
- add hydrochloric acid to all three tubes
- leave the tubes at 37 °C for 30 minutes

The diagram shows the student's investigation.



During the 30 minute period, the cube of egg white in tube A becomes smaller and the very small pieces of egg white in tube B disappear.

(a) (i) State where this reaction takes place in the human body.

(1)

(ii) State why hydrochloric acid is added to tubes A and B.

(1)

(iii) Explain the results observed in tubes A and B.

(4)

(iv) After 30 minutes the student does a biuret test to see if protein is still present in tube B.

Explain why this test is positive for protein.

(2)

(b) (i) Explain what results would be expected for tube C after 30 minutes.

(2)

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(ii) Explain the purpose of tube C in the investigation.

(2)

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(Total for Question 4 = 12 marks)

5 The passage is about respiration.

Complete the passage by writing a suitable word or words in each blank space.

(9)

Aerobic respiration occurs in the ..... of a cell.

During aerobic respiration, glucose is broken down into .....

and ..... as energy is released. This energy

is used to add a phosphate [P] group to ..... which

forms ..... .

Some of the energy is released as ..... energy.

If oxygen is absent, ... respiration occurs. This releases

less energy and produces lactic acid as a waste product. This waste product is

later broken down in the ..... .

There is also a need to repay the ..... which has built up.

(Total for Question 5 = 9 marks)

TOTAL FOR PAPER = 60 MARKS

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