

Paper Reference(s) 4HB1/02
Pearson Edexcel International GCSE (9–1)

Human Biology
UNIT: 4HB1
PAPER: 02

Diagram Booklet

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

INSTRUCTIONS

There may be spare copies of some diagrams in case you need them.

**THIS DIAGRAM BOOKLET MUST BE
RETURNED WITH THE QUESTION PAPER
AT THE END OF THE EXAMINATION.**

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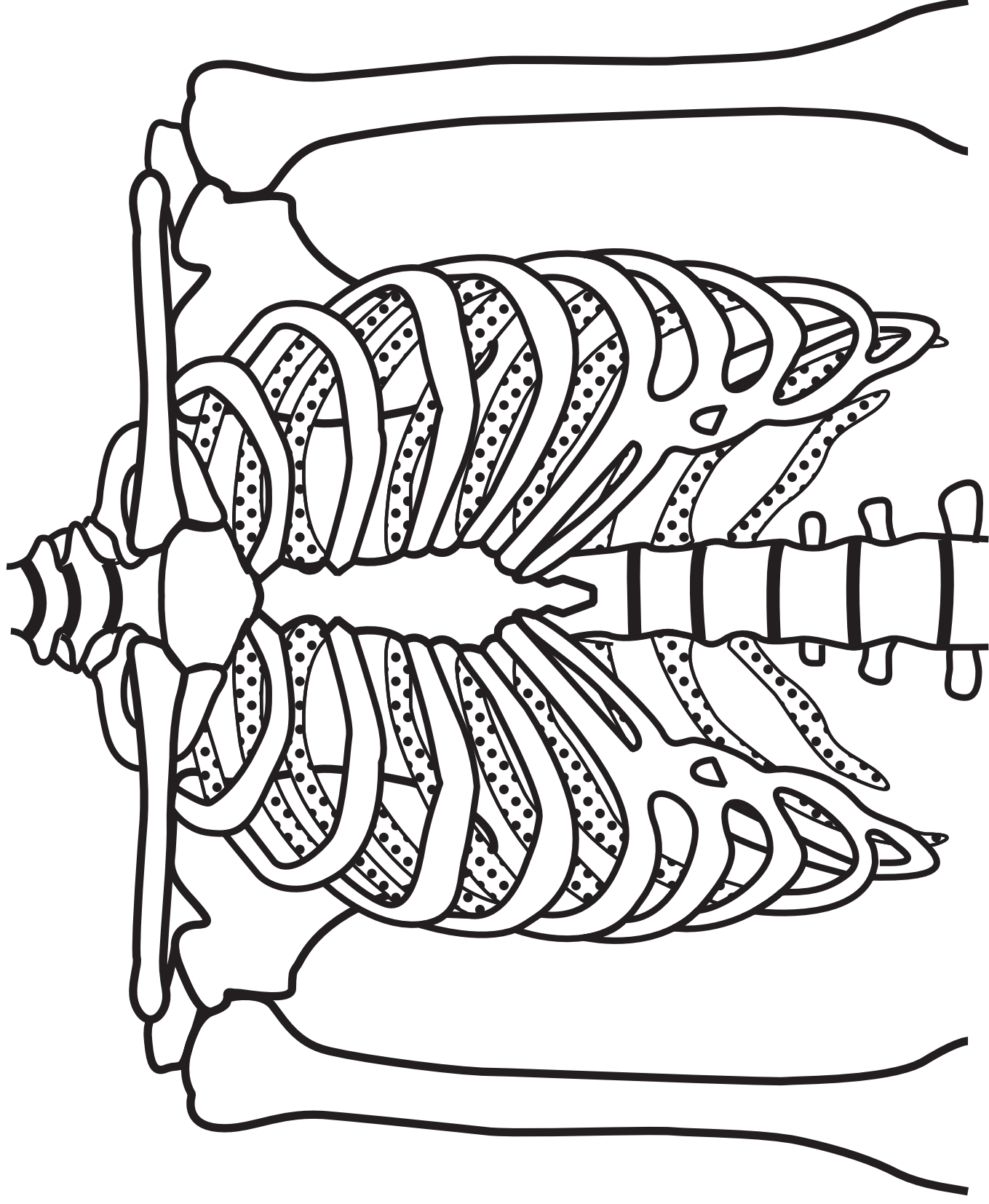
Contents continued.

Spare Copies

21 Question 1(a)

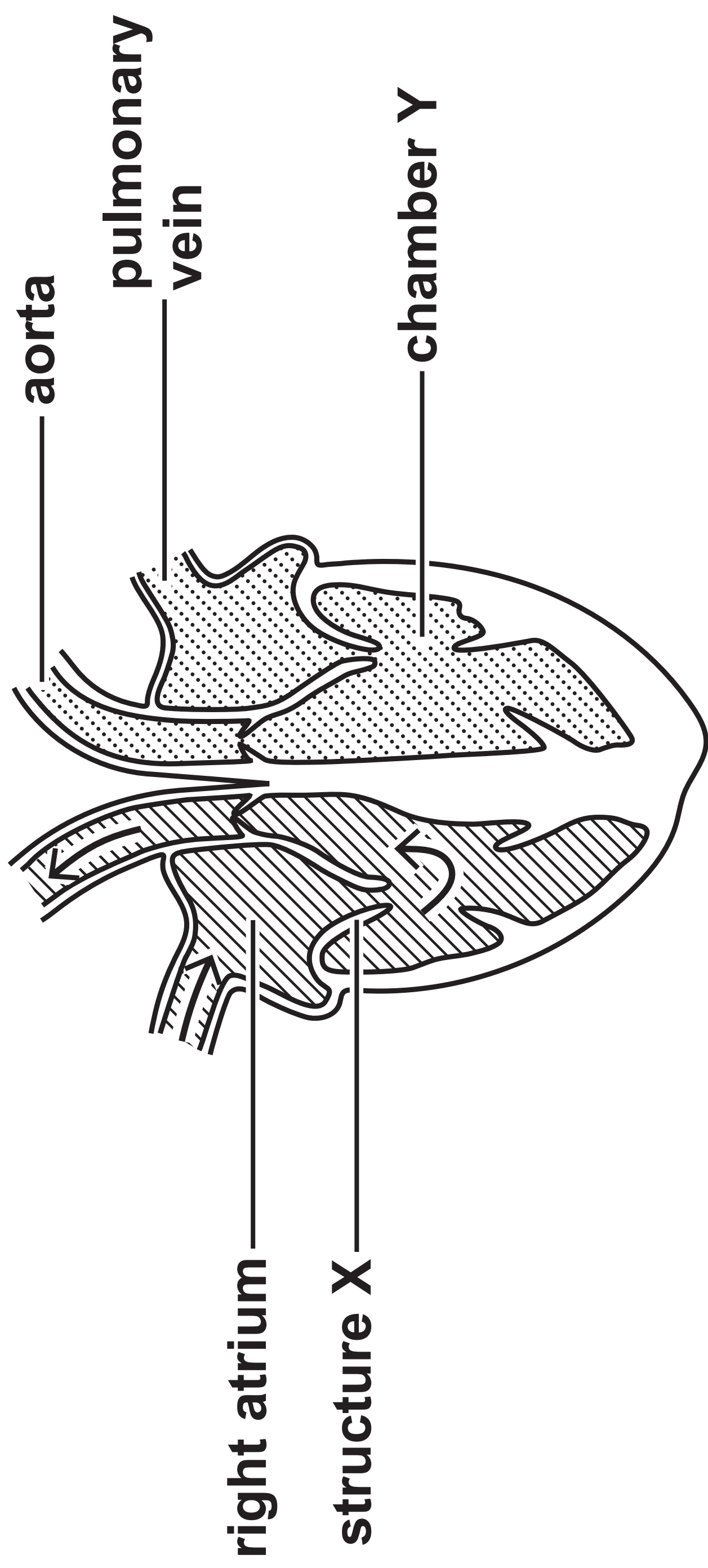
22 Question 5(b)

Question 1(a)



Question 2(a)

6



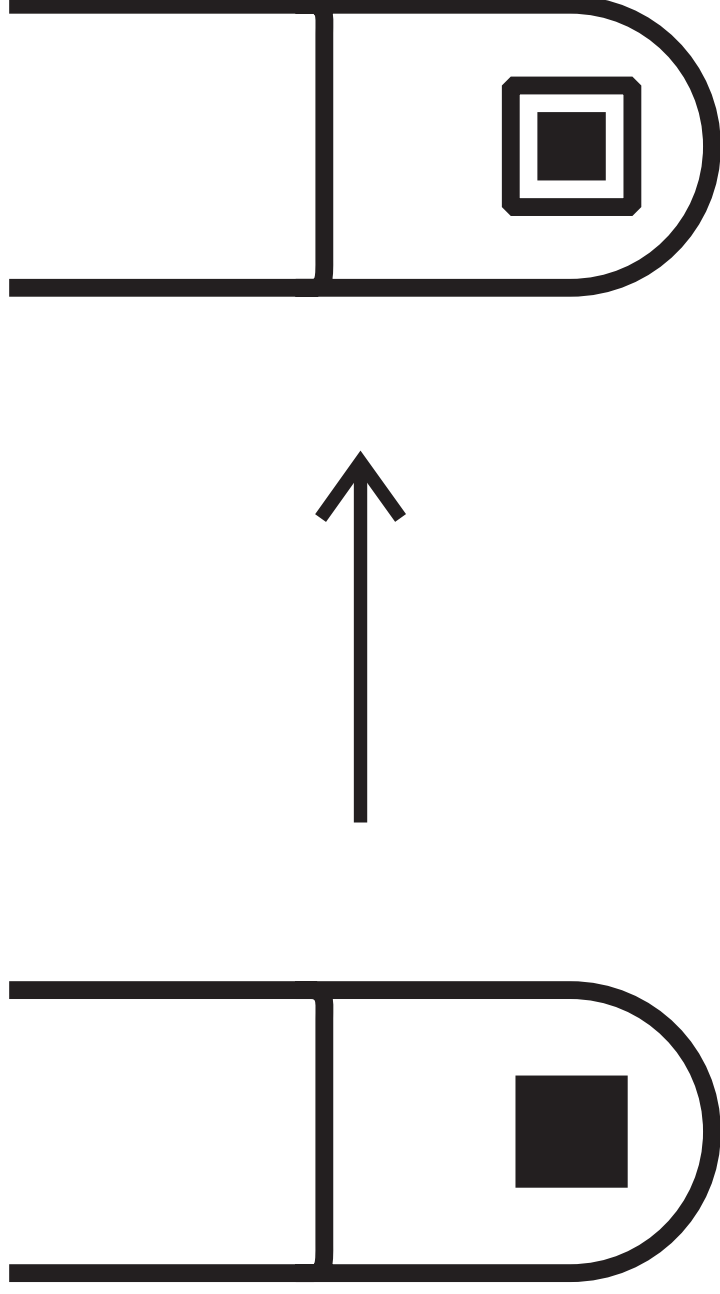
Question 2(c)(ii)



Question 3

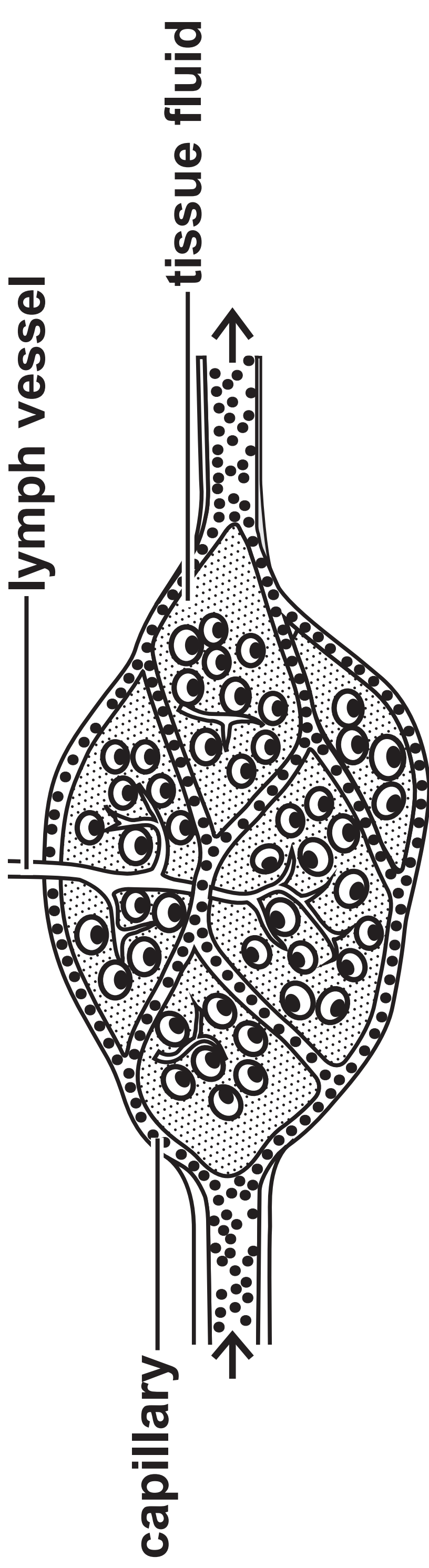
8

agar cube when first placed in acid agar cube starts to become colourless



Question 4(a)

9



Question 5(b)

[illegible]

Question 6(a)

In 2012, Shinya Yamanaka, a Japanese research scientist, won a Nobel Prize for his work on stem cells. He demonstrated that it was possible to take a sample of blood or skin cells from a person and induce these cells to have the properties of stem cells. 5

In the past, stem cell research scientists needed to obtain human embryonic stem cells from embryos produced by IVF. This required the agreement of those people involved. Embryonic cells can continually divide and can become any human body cell. Scientists have been exploring the use of embryonic stem cells as medical treatments for many different diseases and conditions. 10 15

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Question 6(a) continued.

Using the work of Yamanaka and his team, scientists can now produce cells called induced pluripotent stem cells (iPS cells). Cells from the patient are treated with four factors which control the expression of genes. This produces iPS cells from the patient's own cells, which can then be used in stem cell therapies.

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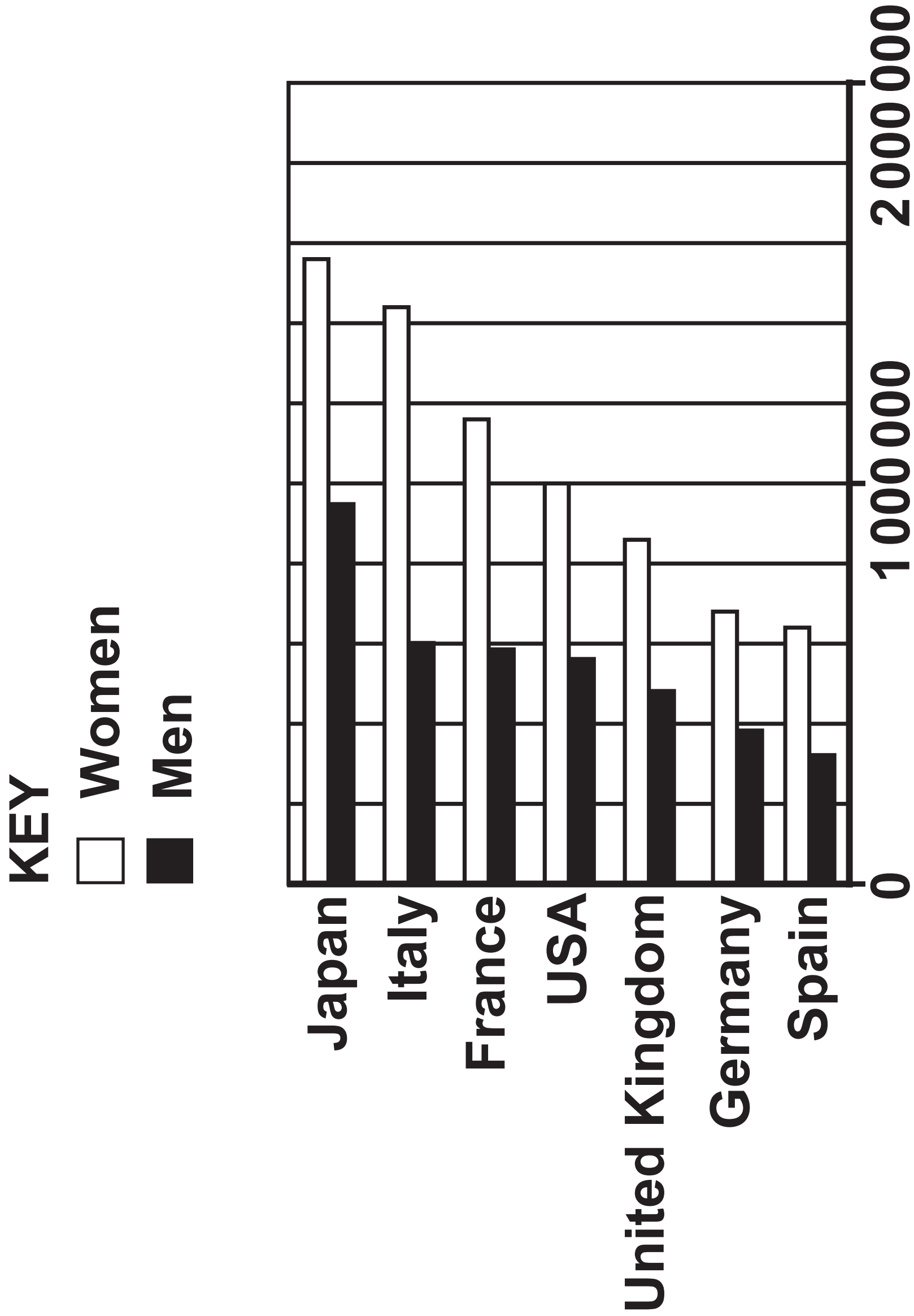
25

This technique is easy to replicate but there are concerns that unlicensed clinics are offering stem cell treatments. Many of these treatments are expensive and success rates are not proven. In addition, stem cells have the potential to continue to divide in the body. Many of the diseases and conditions that stem cell therapies could be used to treat have no other effective treatments. This makes stem cell therapy a desirable option.

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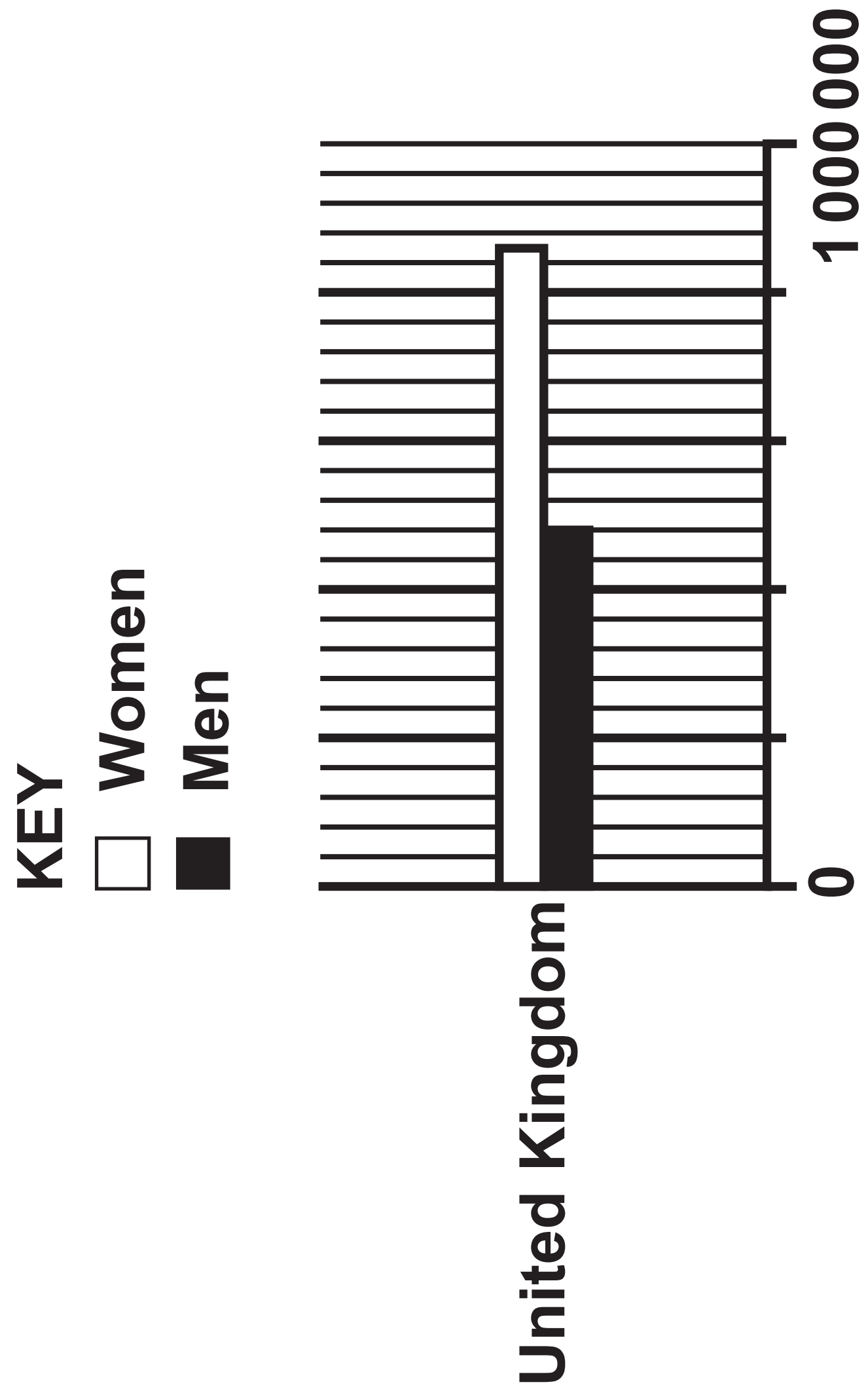
Question 6(b)(i)



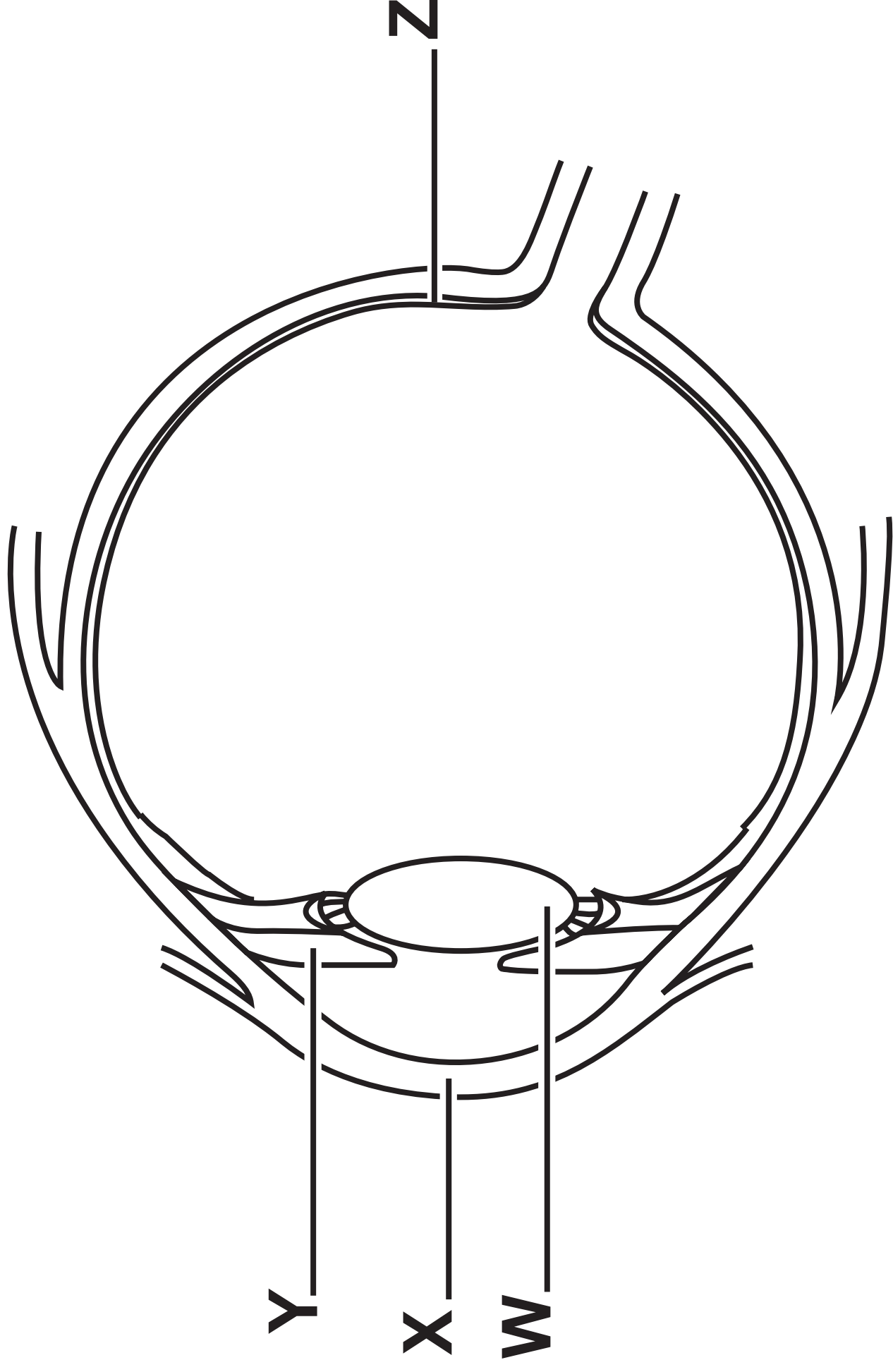
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Question 6(b)(i) continued.



Question 6(b)(ii)



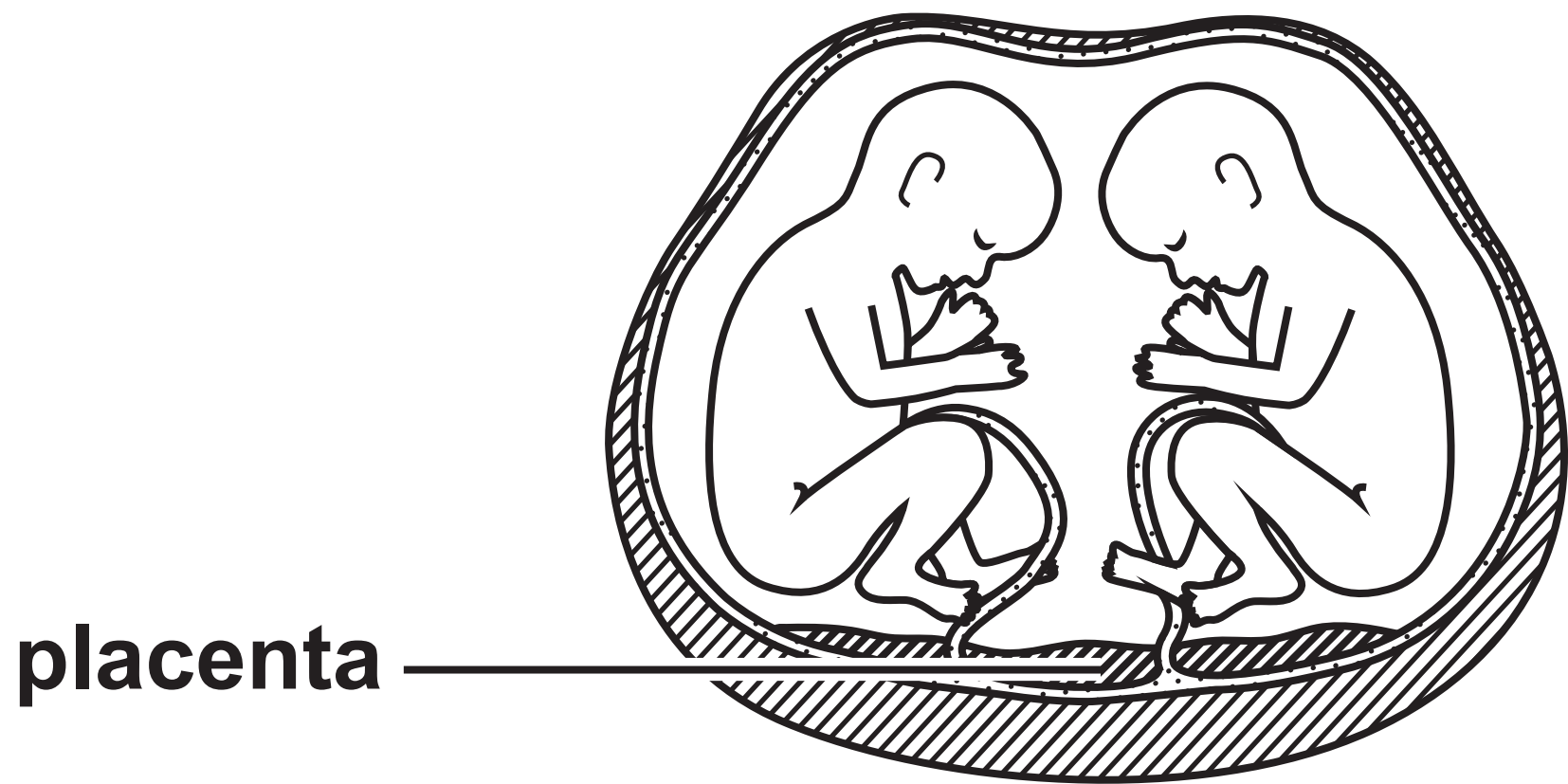
	Structure		
Function	glomerulus	proximal tubule	renal vein
regulation of water level			
ultrafiltration			
reabsorption of glucose			

	Structure		
Function	glomerulus	proximal tubule	renal vein
removal of blood from kidney			
supply of blood to kidney			
removal of urine from collecting duct			

Question 7(b)

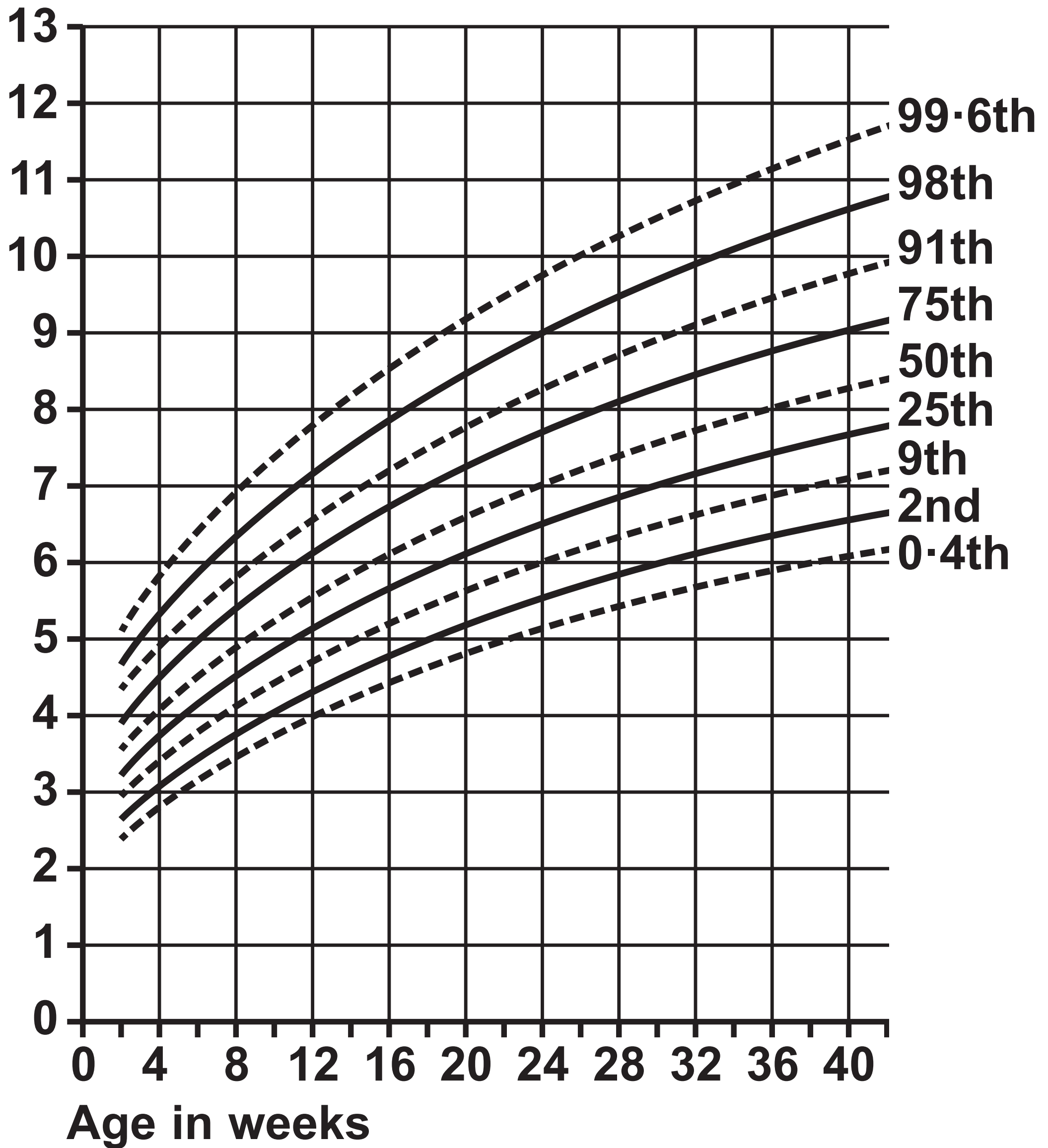
Component	Percentage composition	
	first sample	second sample
ammonia	0·05	0·08
uric acid	0·03	0·08
ions	1·34	1·46
urea	2·00	2·80
water	95·00	91·50

Question 8(b)

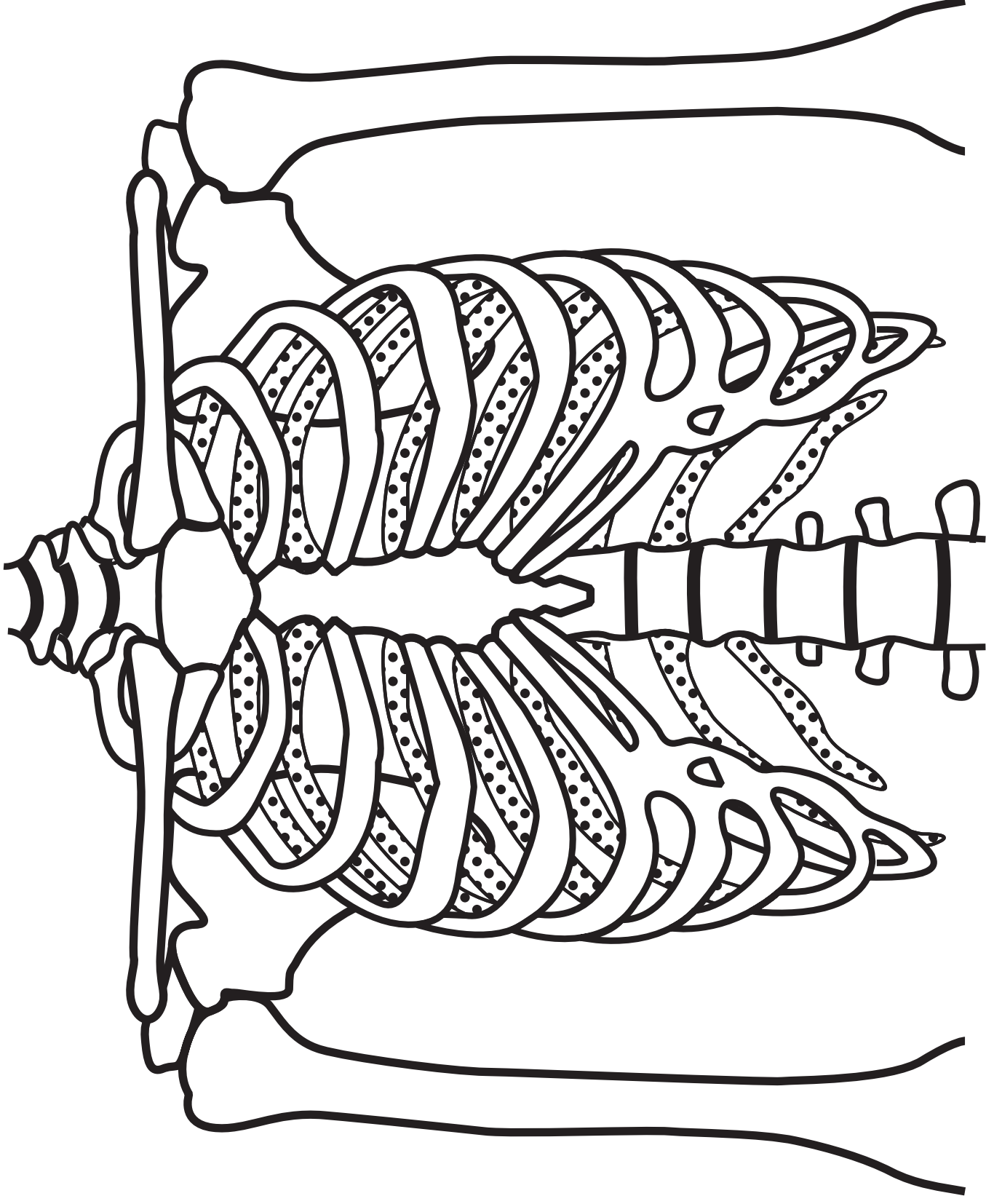


Question 8(c)

Mass
in kg



Question 1(a)



Question 5(b)

[illegible]

Acknowledgements

**Question 1(a): Source adapted from: (c)
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