

A Level Biology A
H420/01 Biological Processes

Question Set 16

16 (a) (i) Fig. 16 shows pressure changes during the cardiac cycle.

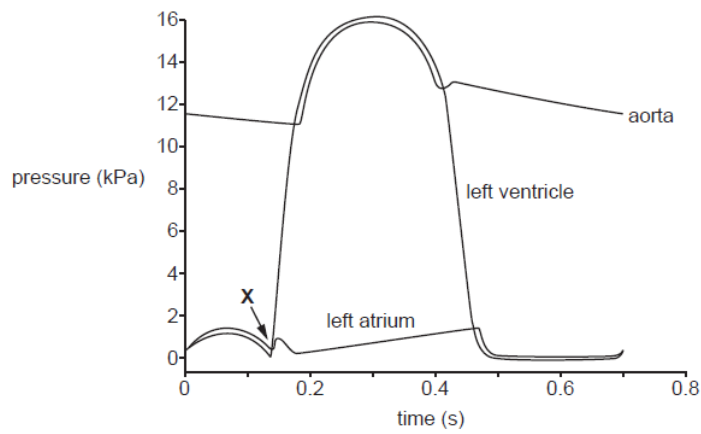


Fig. 16

Using Fig. 16, compare the changes in pressure in the left ventricle with the changes in pressure in the left atrium.

[4]

16 (a) (ii) Using Fig. 16, calculate the heart rate of this individual.

Give your answer to 2 significant figures.

heart rate = [1]

16 (a) (iii) Using Fig. 16, calculate the percentage change between minimum and maximum pressure in the aorta.

Give your answer to **2** significant figures.

percentage change =

[2]

16 (a) (iv) Name the valve which closes at point **X** on Fig. 16.

[1]

16 (b) The heart supplies oxygenated blood to the tissues.

VO_2^{\max} is a measurement of the maximum volume of oxygen that an individual can use during intense exercise in a given time.

Smart watches can estimate the VO_2^{\max} of an individual by measuring heart rate while exercising.

Having a higher VO_2^{\max} is associated with improved aerobic fitness.

Two male students exercised for 30 min and used smart watches to record their VO_2^{\max} .

Table 16 shows their masses and the VO_2^{\max} values they recorded.

Student	Mass (kg)	VO_2^{\max} ($\text{cm}^3 \text{ kg}^{-1} \text{ min}^{-1}$)
1	65	50.4
2	57	48.2

Table 16

Student 1 drew the following conclusion from this result:

My VO_2^{\max} is higher because my mass is greater. I have more cells Student 2. Each cell needs oxygen to carry out

Student 2 said that this conclusion is invalid because several variables have not been controlled.

State **three** variables necessary for a valid comparison that have **not** been controlled in the above experiment.

[3]

16 (c) Brown fat is a type of tissue.

Brown fat has a higher need for oxygen because fat cells in this tissue carry out aerobic respiration at a higher rate than fat cells in other tissues.

Suggest which organelle is present in higher numbers in brown fat cells than in other fat cells.

[1]

Total Marks for Question Set 16: 12

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge