Transport in animals – 2021/20 GCE AS Biology A

1. Nov/2021/Paper-H020/01/No.2

Which of the options, **A** to **D**, would result in the formation of tissue fluid?

A hydrostatic pressure < oncotic pressure

B hydrostatic pressure = oncotic pressure

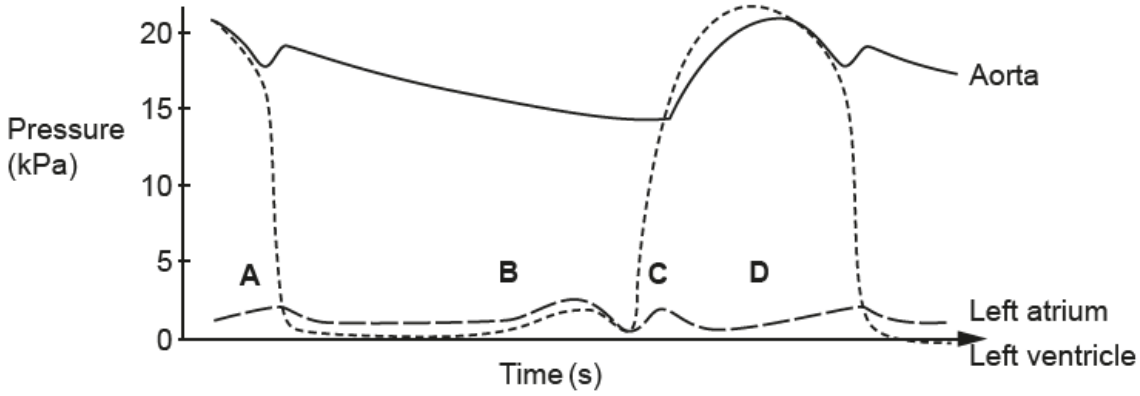
C oncotic pressure < hydrostatic pressure

D oncotic pressure ⩾ hydrostatic pressure

Your answer ☐ **[1]**

2. Nov/2021/Paper-H020/01/No.3

Which of the options, **A** to **D**, on the diagram below shows the time at which the SAN sends out a wave of excitation to initiate a heartbeat?



Your answer ☐ **[1]**

3. Nov/2021/Paper-H020/01/No.4

The sounds of the heartbeat due to heart valves closing can be described as 'lub-dub'. The 'lub' sound occurs at the beginning of ventricular systole.

Which of the options, **A** to **D**, describes what is happening when the 'lub' sound is heard?

A semilunar valves opening and blood entering the ventricles

B semilunar valves closing and blood entering the ventricles

C atrio-ventricular valves opening and blood leaving the ventricles

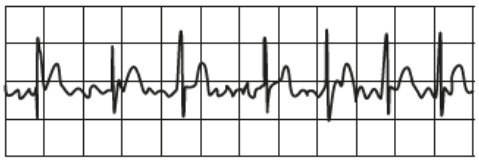
D atrio-ventricular valves closing and blood leaving the ventricles

Your answer ☐ **[1]**

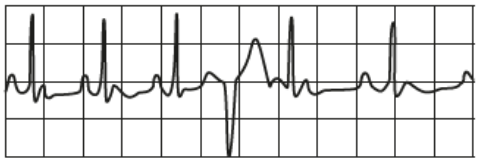
4. Nov/2021/Paper-H020/01/No.13

The ECG traces below show four abnormal heartbeats recorded for six seconds.

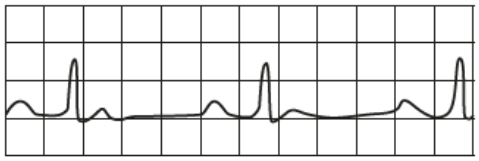
A



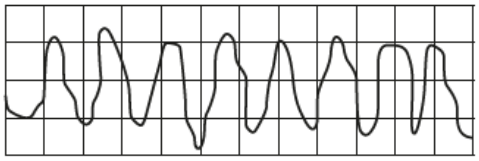
B



C



D



Which of the traces, **A** to **D**, shows atrial fibrillation?

Your answer ☐ **[1]**

5. Nov/2021/Paper-H020/01/No.15

Which of the options, **A** to **D**, best describes the chloride shift?

A hydrogen carbonate ions and chloride ions moving into red blood cells

B hydrogen carbonate ions moving out of red blood cells and chloride ions moving into red blood cells

C hydrogen ions being buffered by chloride ions in red blood cells

D carbonic anhydrase using chloride ions to produce carbonic acid

6. Nov/2021/Paper-H020/01/No.23

Fig. 23.1 shows a spirometer trace of a student at rest breathing for one minute.

The trace shows a period of resting breathing, followed by a maximum inhalation and exhalation.

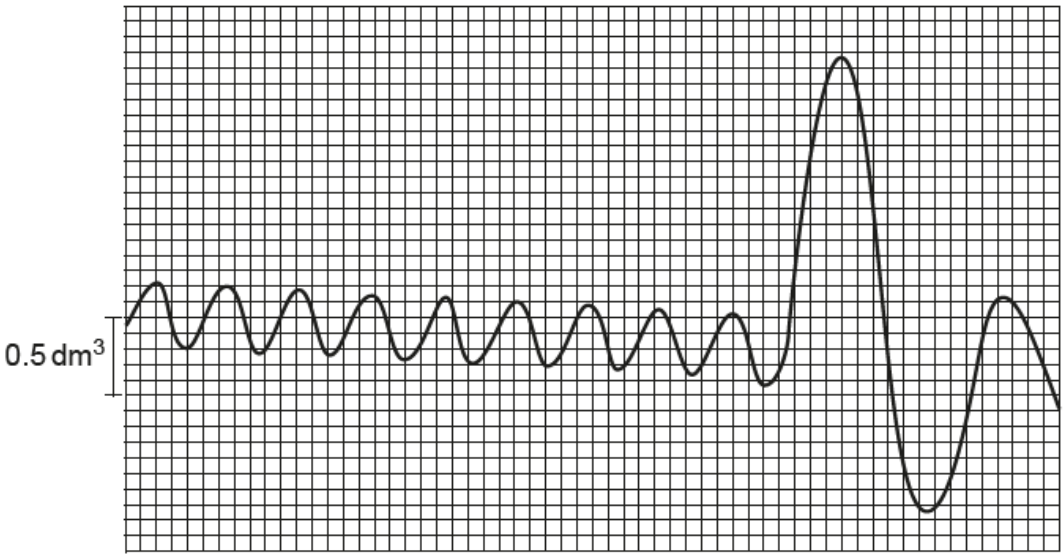


Fig. 23.1

(a) (i) Explain why there is a downward trend in the trace.

.....

..... **[2]**

(ii) Using **Fig. 23.1**, calculate the mean resting breathing rate.

Mean = ...breaths per minute **[2]**

(iii) Using the trace in **Fig. 23.1**, state the vital capacity.

Give your answer in cm^3.

Vital capacity = ... cm^3 **[2]**

(b) **Fig. 23.2** shows the change in mean resting tidal volume with age in 122 boys and girls from age 12 to 19.

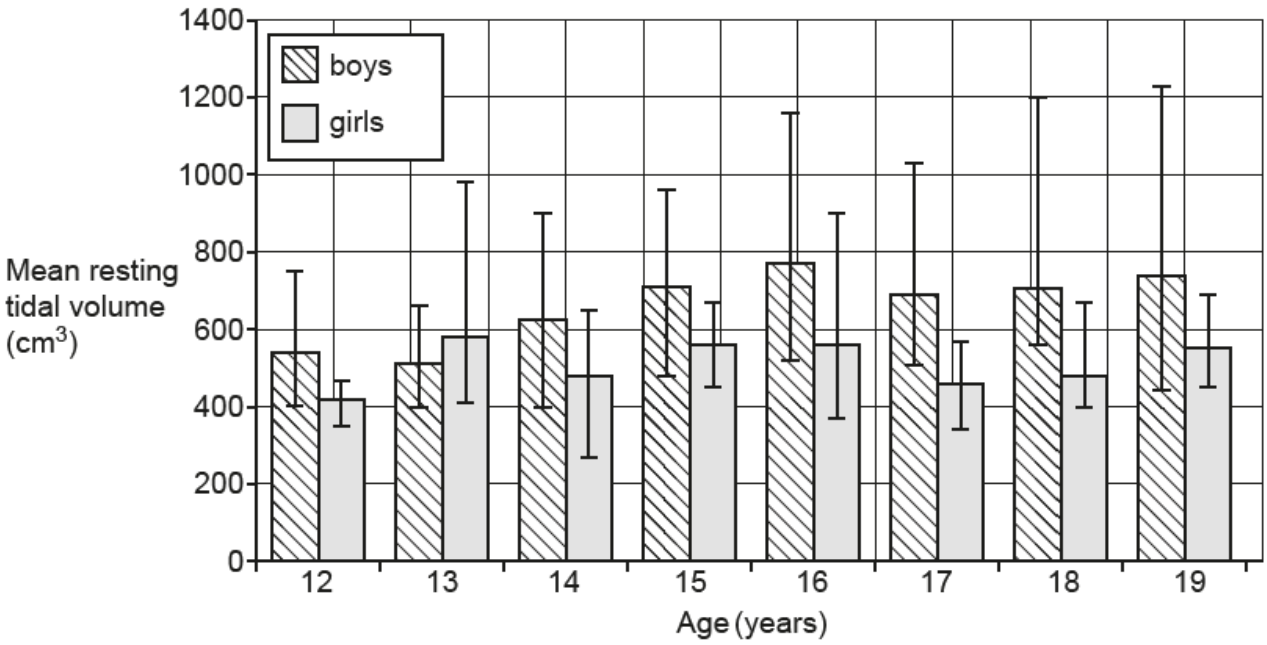


Fig. 23.2

The ranges shown in **Fig. 23.2** are the maximum and minimum values for each group.

(i) Describe **three** patterns in the data in **Fig. 23.2**.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) State **one** group from **Fig. 23.2** that is likely to contain an anomaly. Explain your choice.

Group .....

Explanation .....

.....

.....

.....

[2]

(iii) Explain why using standard deviation error bars in **Fig. 23.2** would increase the confidence in any conclusion made.

.....

.....

.....

.....

..... **[2]**

(iv) The table shows the raw data of resting tidal volume for 13-year-old boys in **Fig. 23.2**.

The mean resting tidal volume for this group is 510 cm^3.

Person	Resting tidal volume (cm^3)
1	410
2	660
3	650
4	440
5	400
6	450
7	540
8	530

Calculate the standard deviation of the resting tidal volume for 13-year-old boys.

Use the formula: $s = \sqrt{\frac{\Sigma(x-\overline{x})^2}{n-1}}$

Give your answer to **3** significant figures.

Standard deviation = ... **[3]**

(v) Other than increasing the sample size, suggest **two** ways that the selection of participants in the study could have improved the validity of the data.

1 .....

.....

.....

2 .....

.....

.....

[2]

7. Nov/2020/Paper-H020/01/No.7

The table below shows the different percentages of three different components of blood vessels.

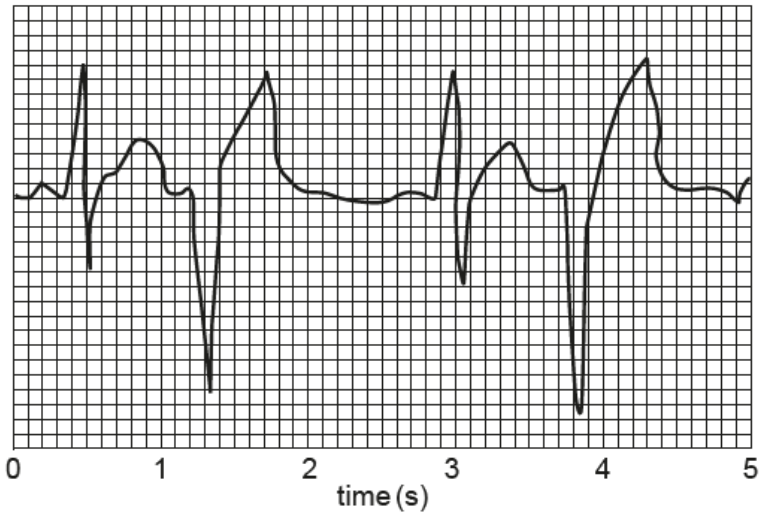
	elastin (%)	smooth muscle (%)	collagen (%)
A	8	33	58
B	17	39	43
C	56	11	33
D	56	45	10

Which of the rows, **A** to **D**, shows the relative proportions of the components of the aorta?

Your answer ☐ **[1]**

8. Nov/2020/Paper-H020/01/No.9

The trace below is an electrocardiogram (ECG) of an abnormal heart activity.



What is the name for this abnormal heart activity?

A bradycardia

B ectopic heartbeat

C fibrillation

D tachycardia

Your answer ☐ **[1]**

9. Nov/2020/Paper-H020/01/No.20

There are four different human blood groups: A, B, AB and O.

This is because there are three different alleles coding for different proteins in red blood cells.

Which of the letters, **A** to **D**, describes this form of variation?

A continuous and intraspecific

B continuous and interspecific

C discontinuous and intraspecific

D discontinuous and interspecific

Your answer ☐ **[1]**