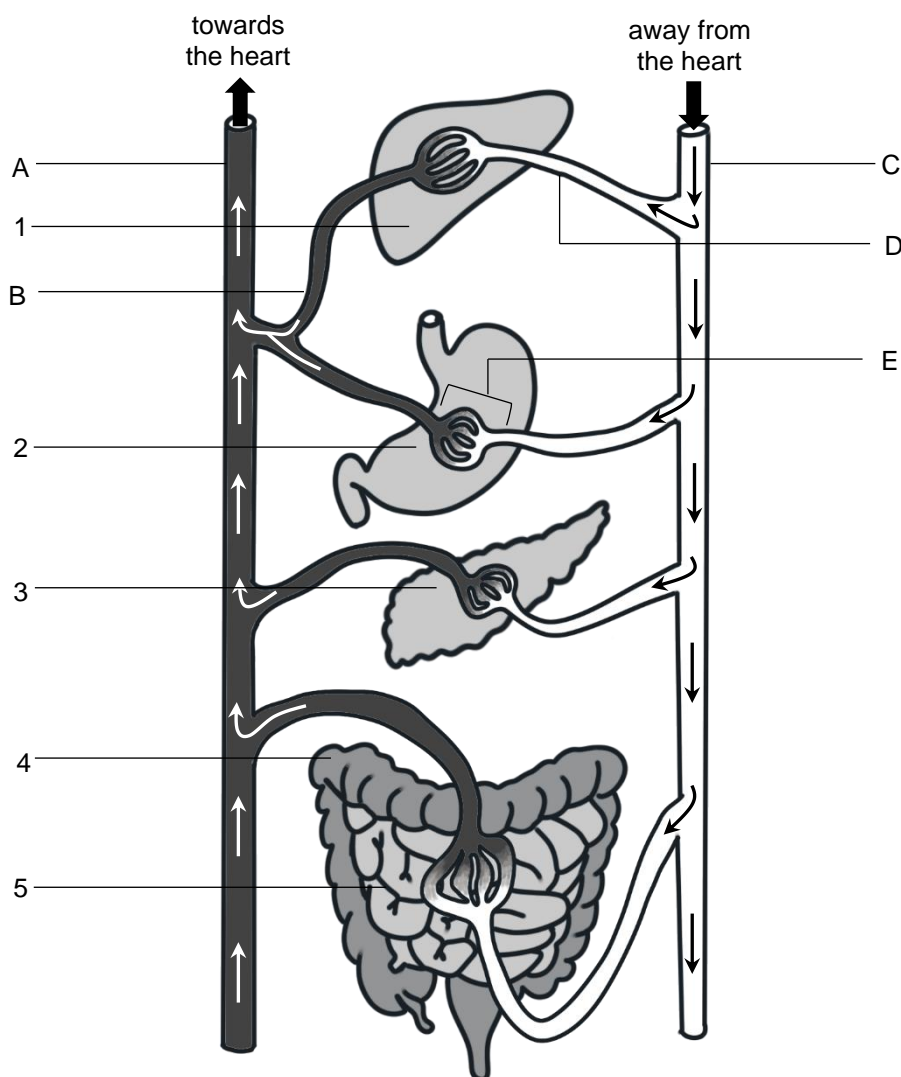


QUESTION 2

2.1 The diagram below shows some of the organs in the human digestive system as well as their blood supply (circulation). Letters **A** to **E** indicate different types of blood vessels. Numbers **1** to **5** indicate different organs. The arrows indicate the direction of blood flow.



- 2.1.1 Give the NUMBER and NAME of the organ that:
 - (a) regulates blood sugar levels (2)
 - (b) contains hydrochloric acid (2)
- 2.1.2 Give the numbers of any TWO organs that contain enzymes. (2)
- 2.1.3 What is the circulation between the heart and the organs called? (1)
- 2.1.4 Identify the type of blood vessel represented by **C**. (1)
- 2.1.5 Give ONE visible reason for your answer in QUESTION 2.1.4. (1)

● 2.1.6 Describe ONE structural difference between blood vessels **A** and **C**. (2)

2.1.7 **E** represents a capillary network.

● (a) Name the process that occurs inside a capillary network to provide oxygen to the cells/tissues. (1)

● (b) Capillaries transport blood under a very low pressure and have very thin walls. Explain why these two characteristics are important in the functioning of capillary networks. (2)

● 2.1.8 Identify organ **1**. (1)

● 2.1.9 Explain which blood vessel (**B** or **D**) will contain blood with a lower concentration of toxins. (3)

● 2.1.10 The average length of organs **4** and **5** are provided below:

organ **4** = 0,3 m

organ **5** = 7 m

Calculate how many times longer organ **5** is than organ **4**. Show ALL calculations. Round off to the nearest whole number. (2)

● 2.1.11 There is a condition in cattle where the lining of organ **5** becomes smooth. Consequently, the cattle become weak and waste away (die). Explain why this condition will have such an effect. (3)

MEMORANDUM

- 2.1.1 (a) 3✓ – pancreas✓
(b) 2✓ – stomach✓ (4)
- 2.1.2 2✓, 3✓, 5✓ (mark only first TWO) (2)
- 2.1.3 systemic✓ circulation (1)
- 2.1.4 artery✓ (1)
- 2.1.5 – it transports blood away from the heart✓ **OR**
– it transports blood towards the organs/tissues/cells✓ (mark only the first ONE) (any 1)
- 2.1.6 – C has no valves✓, A has valves✓ **OR**
– C has thick walls✓, A has thin walls✓ **OR**
– C has a narrow lumen✓, A has a wide lumen✓ (mark only first ONE) (any 1 x 2)
- 2.1.7 (a) diffusion✓/ gaseous exchange (1)
(b) very thin walls allow for faster diffusion of gases✓ into/out of tissues
very low pressure provides slower blood flow✓/allows more time for diffusion
OR
very thin walls of capillary blood vessels would burst✓ under high pressure✓
OR
very thin walls of capillary blood vessels do not burst✓ with very low pressure✓ (any 1 x 2)
- 2.1.8 liver✓ (1)
- 2.1.9 – B✓
– the liver removes toxins from the blood✓
– blood that leaves the liver✓ will contain fewer toxins
OR
– B✓
– the liver removes toxins from the blood✓
– blood that enters the liver✓ / has not moved through the liver yet will contain more toxins (any 1 x 3)
- 2.1.10 Ratio = $\frac{7}{0.3}$ ✓ = 23,333 = 23✓ times longer (whole number) (2)
- 2.1.11 – Loss of villi reduces the size of the (absorptive) surface area✓
– fewer nutrients are absorbed✓ / rate of (nutrient) absorption is decreased
– animals do not receive enough nutrients/food to survive✓ / they starve (3)