

1 The nervous system coordinates the responses of animals to changes in their environment.

(a) Fig. 2.1 shows the arrangement of the nervous system in a mammal.

Complete Fig. 2.1 by writing the names of the missing parts of the mammalian nervous system in the boxes.

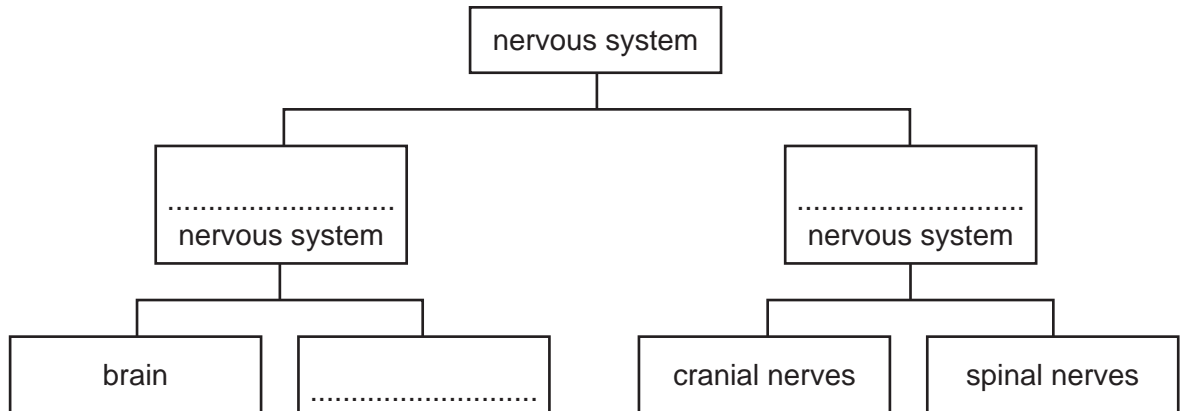


Fig. 2.1

[3]

(b) Fig. 2.2 is a flow chart that shows how an involuntary action is controlled.

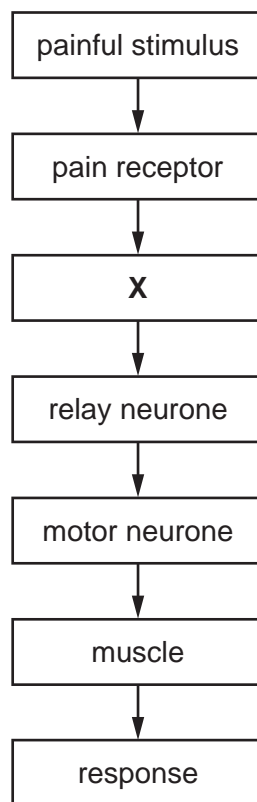


Fig. 2.2

(i) State the structure found at X.

..... [1]

(ii) State the type of involuntary action shown by the flow chart.

..... [1]

(iii) State **two** ways in which a voluntary action differs from an involuntary action.

1

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2

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[2]

(c) Fig. 2.3 shows three pots of seedlings that have been kept in different conditions.

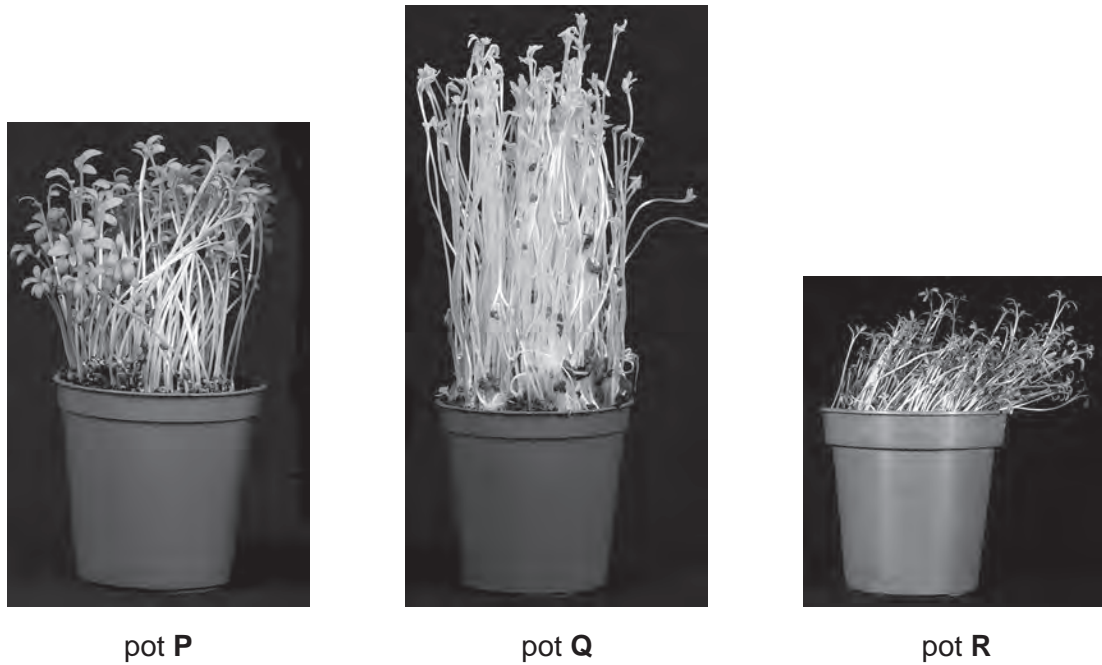


Fig. 2.3

(i) State the conditions in which pots **P** and **Q** were kept.

P

Q

[1]

(ii) State the name of the growth response shown by the seedlings in pot **R**.

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[2]

(iii) Explain the advantage to the seedlings of this growth response.

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[2]

(iv) Auxins control the growth responses of seedlings.

Explain how auxins control the growth response of the seedlings in pot **R**.

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[4]

[Total: 16]

2 Fig. 3.1 is a diagram of human skin in cold weather.

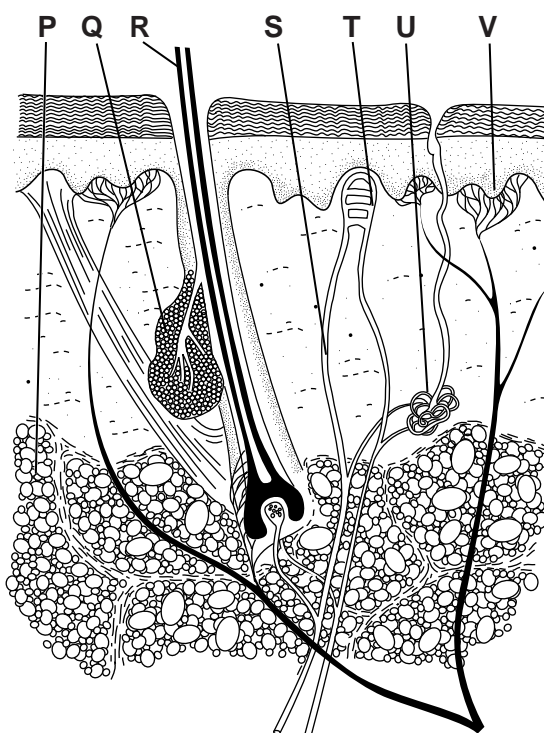


Fig. 3.1

(a) Table 3.1 shows the responses of the skin to cold weather.

Complete the table by:

- naming the parts of the skin that respond to cold weather
- using the letters (**P** to **V**) from Fig. 3.1 to identify these parts of the skin.

Table 3.1

responses of skin to cold weather	name of part	letter from Fig. 3.1
stands upright to trap air		
constricts to reduce blood flow to skin		
stops producing sweat		

[3]

(b) The response of the skin to cold weather is an involuntary action.

Explain how an involuntary action differs from a voluntary action.

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[3]

(c) Describe how the nervous system coordinates the response of the skin to cold weather.

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[4]

(d) Explain how negative feedback is involved in the control of body temperature.

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[3]

[Total: 13]

3 Fig. 2.1 shows a diagram of the liver and the blood vessels that enter and exit from it.

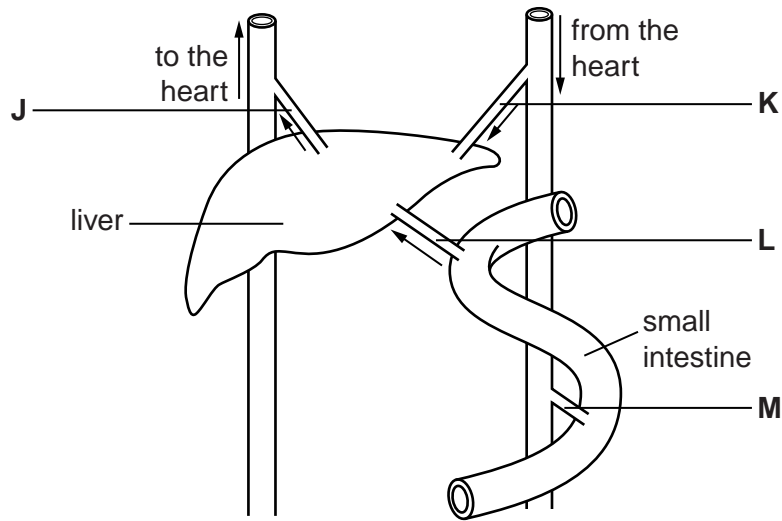


Fig. 2.1

(a) Name blood vessel L.

.....[1]

(b) Blood vessel J is a vein.

State **two** structural features of veins and explain how each feature is related to its function of returning blood to the heart.

feature

explanation

.....

feature

explanation

.....[4]

- (c) Blood samples were taken from each of the blood vessels **J**, **K**, **L** and **M** two hours after a meal of rice. Table 2.1 shows the concentration of glucose in these blood samples.

Table 2.1

blood vessel	blood glucose concentration /mg per 100 cm ³
J	135
K	128
L	181
M	133

Calculate the percentage increase in blood glucose concentration between blood vessel **J** compared with **L**. Express your answer to the nearest whole number.

Show your working.

..... %
[2]

- (d) Control of blood glucose by the liver is an example of homeostasis.

- (i) Explain how the liver lowers blood glucose concentration when it is too high.

.....

 [2]

- (ii) Name **one other** factor in the human body that is also controlled by homeostasis.

.....
 [1]

(e) Amino acids are processed by the liver.

Describe this process.

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[3]

(f) State **one other** function of the liver, besides homeostasis and processing amino acids.

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[1]

[Total: 14]

4 Fig. 3.1 is a diagram that shows the control of blood glucose concentration.

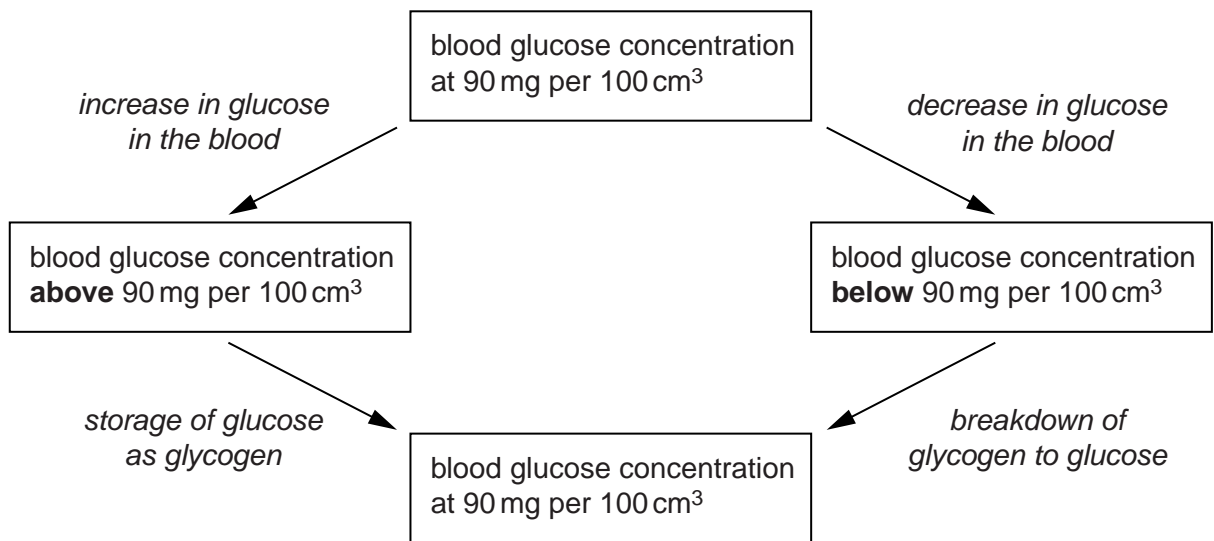


Fig. 3.1

(a) (i) State **one** reason why the concentration of glucose in the blood **increases**.

.....
[1]

(ii) State **one** reason why the concentration of glucose in the blood **decreases**.

.....
[1]

(iii) Name **two** places in the body where glycogen is stored.

1
 2
 [2]

(b) Explain how an increase in glucose concentration is controlled in the body.

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[3]

- (c) If the blood glucose concentration is very high there is a decrease in the water potential of the blood. This may damage the red blood cells.

Explain how a decrease in water potential of the blood may damage red blood cells.

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.....[3]

[Total: 10]