

5: Coordination, response and homeostasis – Topic questions**Paper 4**

The questions in this document have been compiled from a number of past papers, as indicated in the table below.

Use these questions to formatively assess your learners' understanding of this topic.

Question	Year	Series	Paper number
2	2016	June	41
4	2016	November	43
6	2016	June	42

The mark scheme for each question is provided at the end of the document.

You can find the complete question papers and the complete mark schemes (with additional notes where available) on the School Support Hub at www.cambridgeinternational.org/support

2 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.

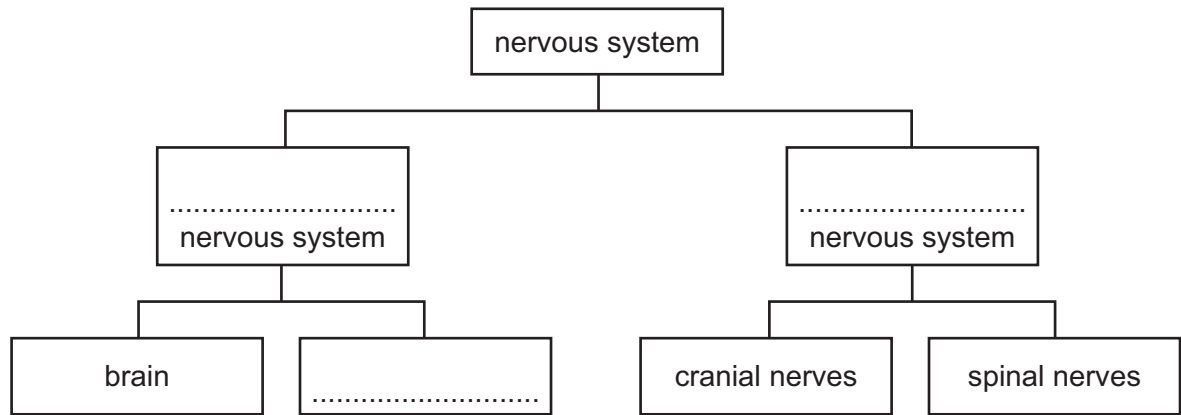


Fig. 2.1

[3]

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

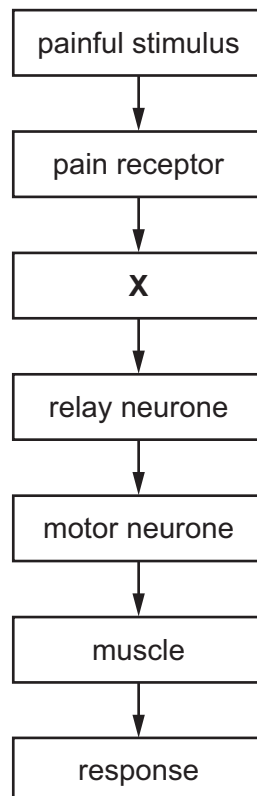


Fig. 2.2

(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

.....

2

.....

[2]

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

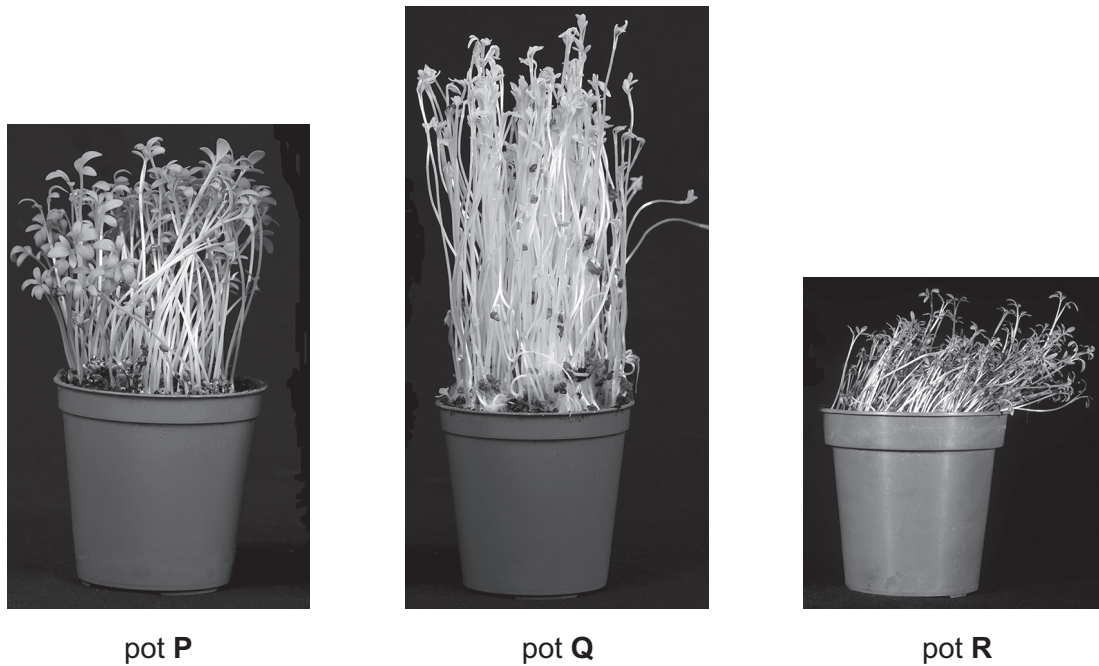


Fig. 2.3

(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**.

..... [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]

4 Tobacco smoke is made up of over 7000 chemicals.

Nicotine is a component of tobacco smoke.

(a) Explain why nicotine is a drug.

.....

.....

.....

.....

.....[2]

(b) Describe the effect on the gas exchange system of the following components of tobacco smoke:

carbon monoxide

.....

.....

.....

tar

.....

.....

.....[4]

- The results are shown in the two graphs in Fig. 4.1.



- [4]

- (ii) Use the information from **both** graphs in Fig. 4.1 to discuss the link between smoking and lung cancer.

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.....[4]

- (d) Explain why it is recommended that pregnant women do not smoke.

.....

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.....

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.....[3]

[Total: 17]

6 Fig. 6.1 shows the changes in glucose concentration of the blood.

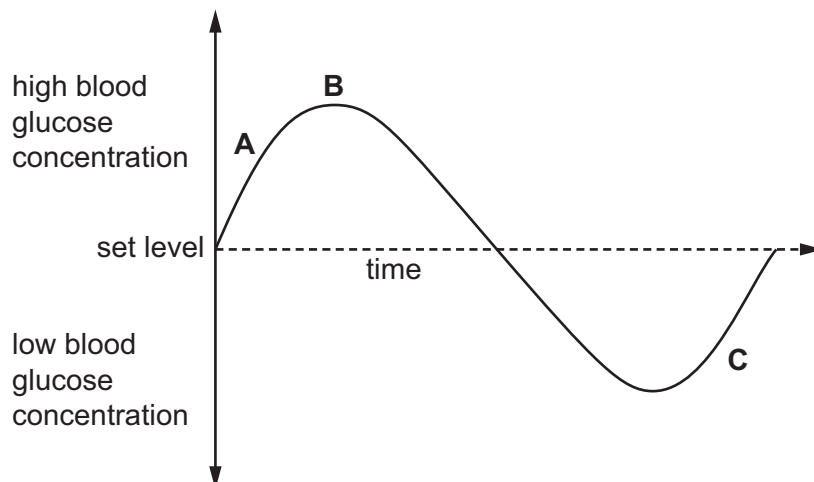


Fig. 6.1

(a) Name the process that maintains blood glucose concentration within set limits.

..... [1]

(b) (i) Name the hormone that would be secreted in response to the increasing blood glucose concentration at **A** in Fig. 6.1.

..... [1]

(ii) Name an organ that is responsible for the decrease in blood glucose concentration after **B** in Fig. 6.1.

..... [1]

(iii) Name the compound that is converted to glucose at **C** in Fig. 6.1.

..... [1]

[illegible]

[Total: 9]

Abbreviations used in the Mark Scheme:

;	separates marking points
/	alternatives
I	ignore
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
AW	alternative wording (where responses vary more than usual)
AVP	any valid point
ecf	credit a correct statement / calculation that follows a previous wrong response
ora	or reverse argument
()	the word / phrase in brackets is not required, but sets the context
<u>underline</u>	actual word given must be used by candidate (grammatical variants excepted)
max	indicates the maximum number of marks that can be given

Question	Answer	Marks
2 (a)	central (nervous system) ; peripheral (nervous system) ; spinal cord ;	[3]
2 (b) (i)	sensory neurone ;	[1]
2 (b) (ii)	simple reflex / reflex ;	[1]
2 (b) (iii)	slower / takes more time ; needs thought / uses (higher centres of) the brain / conscious control ; learnt / not inherited / not innate / needs training / AW ; not automatic ; response is not always the same to the stimulus ;	[max 2]
2 (c) (i)	either pot P – (uniform) light AND pot Q – no light / dark / covered (up) ; or pot P – (uniform) with / plus, magnesium AND pot Q – no magnesium;	[1]
2 (c) (ii)	positive ; (photo)tropism / (photo)tropic ;	[2]
2 (c) (iii)	idea that leaves / seedlings / plants / chloroplasts, get more light ; more (light) energy, absorbed / trapped / AW ; more photosynthesis ; more, growth / biomass / glucose / starch / AW ;	[max 2]

Question	Answer	Marks
2 (c) (iv)	(auxins) made / produced, in (shoot), tip / apex ; pass / move / diffuse / spread (down the stem) ; auxins collect in the side, in the dark / away from light ; greater (cell) elongation on side in the dark ; AVP ; e.g. absorption of water (by osmosis) / stretching of cell walls / phototropin(s) / plants detect or sense light / ref to turgor pressure	[max 4]
[Total: 16]		
4 (a)	(nicotine is) a (chemical) substance taken into the body; that modifies / affects / influences, (chemical reactions in) the body; addictive / can cause withdrawal symptoms (when stopped) / AW	[2]
4 (b)	<i>carbon monoxide</i> : binds to haemoglobin (permanently); Accept carboxyhaemoglobin reduced oxygen (transport); <i>tar (max 3)</i> : carcinogenic / causes lung cancer; sticks to / blocks / damages, alveoli / cilia; produce more mucus; making prone to (named) respiratory infections; reduced, diffusion / gas exchange;	[4]
4 (c) (i)	1 more men smoked (between 1950–1998 than women); ORA 2 both decrease overall / between 1950 and 1998; 3 (overall) drop in men is more (than in women); ORA Ignore data 4 (1950)–1970: men decreasing and women increasing; 5 1970 onwards : both genders decreasing; 6 larger difference in numbers / %, before 1970s / earlier OR smaller difference in numbers / %, after 1970s / later; AW 7 maximum (implied) for women was 50% and 82% for men; 8 comparative data quote between men and women with units stated once;	[4]
4 (c) (ii)	number of deaths by (lung) cancer shows similar trend as percentage smokers; (correlation) in both men and women / AW; lag in the death rate trend (compared with smokers) / AW; relevant data quote from both graphs; trend more obvious in men / death rate in women is increasing overall; impossible to show conclusive link; (because) cannot control experimental conditions / other lifestyle factors; AVP;	[4]
4 (d)	toxins / AW, in smoke can cross the placenta; increased risk, of miscarriage / still birth / premature birth / low birth weight / deformities; reduces oxygen available to the foetus / foetal brain damage; increased risk, of reduced lung, function / infection, in foetus / infants; babies more likely to become addicted / have withdrawal symptoms; AVP;	[max 3]
[Total: 17]		

Question	Answer	Marks
6 (a)	homeostasis / negative feedback ;	[1]
6 (b) (i)	insulin	[1]
6 (b) (ii)	liver / muscle / pancreas	[1]
6 (b) (iii)	glycogen	[1]
6 (c)	<p>Symptoms: fatigue / AW ; thirst / AW ; increased urination / glucose in urine / fruity breath / ketosis / flushed face; weight loss / nausea / vomiting / abdominal pain / hunger ; blurred vision / glaucoma ; behavioural changes / confusion / faint / unconscious / coma(tose) / dizzy / rapid breathing / deep breathing ; slow (wound) healing / poor circulation ;</p> <p>Treatment: insulin ; by injection / insulin pump ; regular blood glucose tests ; regular meals / controlled diet ;</p>	[max 5]
		[Total: 9]