

WJEC (Eduqas) Biology GCSE  
Topic 4.1 Nervous Co-ordination  
and Control in Humans  
Questions by Topic - Mark  
Scheme

1.			Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)				3	3 → 2 → 5 → 1 → 4 Correct placement All 5 correct;; 3 marks 4/3 correct;; 2 marks 2 correct; 1 mark 0/1 0 marks			
(b)				2	one mark for a named sense organ and the second mark for the <u>correct</u> stimulus;;  one correct pair from: ear; sound/vibrations; or tongue/nose; chemical; or skin; touch/pain/temperature/pressure;			Noise  Taste  Heat
Total Mark				5				

2.		Question	Marking details	Marks Available
(b)	(i)	Eye;		1
	(ii)	Impulses/ <u>electrical</u> signals; Along neurones/nerve/ nerve cells;		2

3.			Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)				2	sound <u>and</u> ears; light <u>and</u> eyes; <i>either order. Stimulus must match organ</i>		High pitch	Ears and hearing in same box
(b)	(i)			1	impulses/ electrical signals;			<i>electric/ electronic/ electricity</i>
	(ii)			1	central (nervous system)/brain/ spinal cord;			Coordinator/ brain
Total Mark				4				

4.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept										
(a) i	1	lips;													
ii	1	elbow;													
(b)	2	{skin becomes/ it becomes/ fingertips, cheek and elbow become} less sensitive; no effect on lip sensitivity/ lip sensitivity stays the same;	skin becomes less sensitive except the lips = 2 marks		reference to any less than the three areas for the 1 <sup>st</sup> mark point										
(c)	4	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">sense organ</th> <th>stimulus detected</th> </tr> </thead> <tbody> <tr> <td style="background-color: #cccccc;"><i>given</i></td> <td>touch/ pressure;</td> </tr> <tr> <td style="background-color: #cccccc;"><i>given</i></td> <td>light;</td> </tr> <tr> <td>ear;</td> <td style="background-color: #cccccc;"><i>given</i></td> </tr> <tr> <td style="background-color: #cccccc;"><i>given</i></td> <td>chemical(s);</td> </tr> </tbody> </table>	sense organ	stimulus detected	<i>given</i>	touch/ pressure;	<i>given</i>	light;	ear;	<i>given</i>	<i>given</i>	chemical(s);			
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ear;	<i>given</i>														
<i>given</i>	chemical(s);														
Total Mark	8														

5.

Question	Marking details	Marks Available										
(a)	<p><b>Either order</b></p> <p>Brain;</p> <p>Spinal cord; NOT spine</p>	2										
(b) (i)	<p>Automatic/ involuntary/ without thought;</p> <p><i>NOT choose to do it/ protective</i></p>	1										
(b) (ii)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Name</th> <th>Purpose</th> </tr> </thead> <tbody> <tr> <td>Blink;</td> <td>protection of eye;</td> </tr> <tr> <td>Pupil diameter change;</td> <td>Regulating/admitting (appropriate level) of light to the eye;</td> </tr> <tr> <td>Withdrawal/ pulling away (in context);</td> <td>prevents damage/ harm to body part;</td> </tr> <tr> <td>Sneezing;</td> <td>Expel/ remove substances from nose</td> </tr> </tbody> </table> <p>NOT cough/ choke</p>	Name	Purpose	Blink;	protection of eye;	Pupil diameter change;	Regulating/admitting (appropriate level) of light to the eye;	Withdrawal/ pulling away (in context);	prevents damage/ harm to body part;	Sneezing;	Expel/ remove substances from nose	2
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<b>Question 5 Total</b>		<b>[5]</b>										

6.

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)	stimuli (1) impulses (1)	1 1			1 1		
	(ii)	I Neurones Accept sensory neurone Reject motor neurone/ relay neurone	1			1		
		II brain/spinal cord	1			1		
(b)	(i)	Any one (x1) from <ul style="list-style-type: none"> <li>• Hearing gets worse from 15/20 metres (for both pupils and teachers)</li> <li>• {Teacher/ older people} hearing deteriorates more from 15/ 20 metres</li> <li>• There is no change in hearing for 15 m/ up to 20m</li> <li>• Everyone could hear (the buzzer) up to 15 m</li> <li>• At {20/25}m more pupils than teacher could hear (the buzzer)</li> </ul>			1	1		
	(ii)	Any one (x1) from: both groups (tested at): same distances/ same buzzer/ same number of people		1		1		1
	(iii)	Any one (x1) from: length of time/ volume/loudness/ frequency of buzzer/ same age in each group/ same room/ same background noise/ same gender			1	1		1
	(iv)	more people (1) more representative/ repeatability/ to spot anomalies (1) Reject repeat experiment Second mark point can only be awarded if first mark point correct			2	2		2
		<b>Question 6 total</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>9</b>	<b>0</b>	<b>4</b>

7.	Question	Marking details	Marks Available
	(a)	Retina; <u>Optic nerve</u> ;	2
	(b)	(i) I suitable scale; 0 at origin, linear scale II all plots correct; $\frac{1}{2}$ small square tolerance 1 error = 1 mark, 2 errors = 0 marks Extrapolation (treat as plotting error – 1) III line quality; Must use a ruler through centre of plots	1  2   1
		(ii) I (level then steady) decrease/ gets smaller; II 5.9 (from graph); allow ecf from graph	1 1
	(c)	(i) Reflex;	1
		(ii) Protective/ protection/ prevents damage/ prevent hurting the body;	1
		<b>Question 7 Total</b>	<b>[10]</b>

8.	Question	Marking details	Marks Available
	(a)	Correct position of label;	1
	(b)	(i) Light;	1
		(ii) Retina;	1
		(iii) Iris (muscle); NOT ciliary muscle	1
	(c)	Speed/ fast / rapid/ quick/ owtte; Protection/ owtte; Automatic/ owtte;	3

9.	Mark	Answer
	6 QWC	<p>Indicative content</p> <ul style="list-style-type: none"> <li>• rapid involuntary protective response (to a stimulus)</li> <li>• light is the stimulus</li> <li>• retina is the receptor</li> <li>• sensory neurone sends the impulse to the relay neurone (Spinal cord = neutral)</li> <li>• via a synapse</li> <li>• impulse passes along the motor neurone</li> <li>• to the <u>muscle of the eyelid</u> which is the effector</li> </ul> <p><b>5-6 marks</b> The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p><b>3-4 marks</b> The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p><b>1-2 marks</b> The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p><b>0 marks</b> The candidate does not make any attempt or give a relevant answer worthy of credit.</p>

10.	Question	Marking details	Marks Available
	(a)	(i) B; D;	2
	(b)	(i) B knee jerk/ withdrawal/OWTTE;	1
		(ii) D blinking/opening and closing the eyelid quickly;	1

**Question 10 total**

**[4]**

11.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a)	2	A choroid; B optic nerve;	Phonetic spelling B: sclera/ sclerotic		
	(b)	Max 4	<ul style="list-style-type: none"> <li>In Diagram 1 the eye is in dim light;</li> <li><u>iris</u> (muscle) makes <u>pupil larger</u>;</li> <li>to allow more light into the eye;</li> <li>(In Diagram 2) the eye is in bright light and the reverse has happened (OWTTE);</li> </ul> OR <ul style="list-style-type: none"> <li>In Diagram 2 the eye is in bright light;</li> <li><u>iris</u> (muscle) makes <u>pupil smaller</u> ;</li> <li>to reduce the amount of light entering the eye;</li> <li>In Diagram 1 the eye is in dim light and the e has happened (OWTTE);</li> </ul>			

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)		A pupil B Iris both for one mark	1			1		
	(ii)		In brighter light (1) {Muscles/ iris} (contract to) reduce pupil {diameter/size} (1) Restricts light entering the eye, so retina is protected (from damage) (1)	1	2		3		
	(iii)		Fast and {involuntary/ automatic} Reject reference to protection	1			1		
(b)	(i)		Reduced reaction time/ faster reactions		1		1		
	(ii)		66.7 = 2 marks Incorrect answer but correct method = 1 mark (25 – 15)/15 x 100 = 66.7(%)= 1 mark 67/ 66.666° % = 1 mark		2		2	2	
	(iii)		Any two (x1) from: • the older the person {the fewer notes hit in 0.2 seconds/ the slower the reactions /the increased reaction time/ ORA • after {practice/repeats} {age 50/ older people} {improvement doubles/ improve more}, (this is more than for younger ages)		1	1	2		
	(iv)	I	Any two (x1) from Equal numbers male/female OR one gender only Same experience of keyboard playing Handedness Eyesight No alcohol/ caffeine			2	2		3
		II	Larger sample size/ wider range of ages/ more people of different ages (1)			1	1		
			<b>Question 12 total</b>	<b>3</b>	<b>6</b>	<b>4</b>	<b>13</b>	<b>2</b>	<b>3</b>

13.	Question	Marking details	Marks Available
	(a)	(i) A Cornea;  B Lens;	2
		(ii) This is where the <u>optic</u> nerve {leaves the eye/is} /there are no {light sensitive/receptor} cells here (so no image);  <i>NOT attached to optic nerve</i>  No impulse {generated/made};  <i>NOT retina</i>  2 <sup>nd</sup> mark only awarded if 1 <sup>st</sup> mark awarded	Max 2
	(b)	Sclera;  Choroid;	2
		<b>Question 13 total</b>	<b>[6]</b>