

Response to Stimuli - Mark Scheme

Q1.

Question Number	Answer	Additional Guidance	Mark
	<p>A description that makes reference to the following:</p> <ul style="list-style-type: none"> • vesicles (containing hormone) (1) • fuse with the cell (surface) membrane (of fat cells) / by exocytosis (1) 		(2)

Q2.

Question Number	Answer	Additional guidance	Mark
(a)	<ol style="list-style-type: none"> 1. reference to phytochrome ; 2. idea that day length is the environmental cue ; 3. reference to critical period / photoperiod ; 4. this is more than 12 hours light / less than 12 hours darkness / eq ; 5. idea that different wavelengths of light are involved <p style="text-align: center;">OR</p> <p>reference to inter-conversion of phytochromes e.g. because light supplies red light which converts P_R converted to P_{FR} ;</p> <ol style="list-style-type: none"> 6. reference to florigen ; 		(3)

Question Number	Answer	Additional guidance	Mark
(b)(i)	Both 1. chemicals ; 2. produced in cells / eq ; 3. idea that they move away from site of production ; 4. effect may be distant from production site / eq ; 5. long-term / permanent effect / example quoted / eq ; 6. involved in gene activation /eq ;	5. ACCEPT both can control growth 6. ACCEPT: Both can have an effect on gene inhibition	(3)

Question Number	Answer	Additional guidance	Mark
(b)(ii)	1. idea that weeds affected because e.g. more sensitive, take up more ; 2. idea that (auxin / IAA) causes cell elongation ;		(2)

Q3.

Question Number	Answer	Additional Guidance	Mark
(a)	C (phospholipid)		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(b)(i)	rhodopsin		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(b)(ii)	(cis) retinal		(1)

Question Number	Acceptable Answer	Additional Guidance	Mark
(c)	<p>A description that makes reference to the following:</p> <ul style="list-style-type: none"> opsin released causing sodium ion channels to be blocked (1) which causes hyperpolarisation in the rod cell (1) causing action potential in bipolar cell (results in action potential in the optic nerve) (1) 		(3)

Q4.

Question Number	Answer	Mark
(a)(i)	B ;	(1)

Question Number	Answer	Mark
(a)(ii)	D ;	(1)

Question Number	Answer	Mark
(a)(iii)	A ;	(1)

Question Number	Answer	Mark
(a)(iv)	D ;	(1)

Question Number	Answer	Mark
(a)(v)	A ;	(1)

Question Number	Answer	Additional guidance	Mark
(b)	<ol style="list-style-type: none"> Ideas of (muscles) work antagonistically ; circular muscle relaxes ; radial muscle contracts; 	ACCEPT 2 stretched	(2)

Q5.

Question Number	Answer				Mark	
(a)	Description	Area of the rod cell				Comp (3)
		A	B	C	D	
	Nearest the pupil of the eye	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Containing the photosensitive pigment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Has the pre-synaptic membrane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Question Number	Answer	Additional Comments	Mark
(b) (i)	1. reference to light intensity required / eq ; 2. light {absorbed / eq} by rhodopsin / eq ; 3. rhodopsin changes shape / eq ; 4. rhodopsin is converted to retinal AND opsin / eq ; 5. opsin binds with cell surface membrane / eq ; 6. idea of fewer {sodium ions /Na ⁺ } enter rod cell ; 7. idea of sodium ions pumped out of rod cell ; 8. hyperpolarisation occurs (leading to change in voltage) / eq ;	2. Ignore hits 3. Accept Cis to Trans retinal 4. Ignore bleaching 6. Accept decreases permeability (of membrane) to {sodium ions /Na ⁺ }, channels close ;	(4)

Question Number	Answer	Additional Comments	Mark
(b) (ii)	1. idea of not enough {rhodopsin is converted /opsin binds to membrane} ; 2. (so) change in voltage is insufficient / eq ; 3. idea of { neurotransmitter / glutamate} still released (from rod cell) ; 4. idea that depolarisation in bipolar neurone insufficient ; 5. idea of bipolar neurone already depolarised ;	4. Accept for depolarisation- { threshold level, generator potential , EPSP} not achieved	(2)