

Biology B

General Certificate of Secondary Education **B631/02**

Unit 1: Modules B1, B2, B3

Mark Scheme for June 2010

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Question		Expected Answers	Marks	Additional Guidance
1	(a)	<p>part of eye</p> <p>optic nerve</p> <p>iris</p> <p>retina</p> <p>cornea</p> <p>job</p> <p>refracts light</p> <p>contains light receptors</p> <p>controls how much light enters the pupil</p> <p>carries impulses to the brain</p> <p>(2)</p>	2	all correct (2) one / two correct (1)
	(b) (i)	<p><u>ciliary</u> muscles contract / shorten (1)</p> <p>(suspensory) ligaments slacken / lose tension (1)</p> <p>lens becomes more convex / bulges / fatter / becomes stronger / refracts more / more rounded / more spherical (1)</p>	3	<p>ignore muscles tighten</p> <p>ignore ligaments relax</p> <p>allow lens becomes fat</p> <p>only allow RA if it is clear it is in the content of watching TV</p>
	(ii)	(bi) concave (lens) (1)	1	<p>allow diverging (lens)</p> <p>allow suitable diagram of concave lens ie narrower in middle</p>
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	high amount of salt in diet / 3 rd box excessive alcohol consumption / 5 th box (1)	1	both correctly ticked for 1 mark more than 2 ticks = 0
	(b) (i)	overweight (1)	1	ignore fat / obese allow bmi>25
	(ii)	BMI = $91.0 / (1.8)^2$ (1) BUT 28.09 or 28.1 or 28 (2)	2	allow 91.0 / 3.24 (1) allow 28.08642 or 28.0864 or 28.086 (2) allow 28.08 or 28.0 max 1 (incorrect rounding)
	(c)	fitness involves being physically active (1) being healthy means free from infection / disease / disorder (1)	2	allow takes part in (active) sports allow quick recovery time allow idea that fitness is to do with physical activity e.g. have stamina / strength / suppleness / speed / agility allow idea that health is to do with whether you have any disease / illness allow idea that health is mental / social well being ignore references simply to (healthy) diet ignore being healthy means there is nothing wrong with you
		Total	6	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	homeostasis (1)	1	allow ringed answer if nothing written on line
	(b)	blood vessels / capillaries / arterioles constrict / become narrower (1) reducing blood flow (to skin surface) (1)	2	allow capillaries / arterioles in surface of skin shut off allow blood vessels contract / get smaller not move away from skin surface ignore references to veins ignore vessels get thinner allow less blood in skin ignore blood flows away from skin
		Total	3	

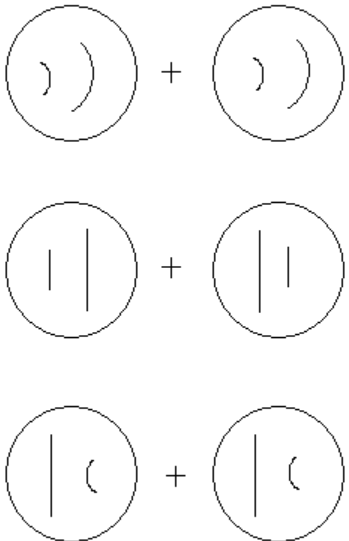
Question		Expected Answers	Marks	Additional Guidance
4	(a)	idea of diet e.g. what you eat, or when you eat / (by matching diet with) exercise (1)	1	allow avoid sugary foods / eat sugary foods
	(b) (i)	4 (1)	1	allow full names adenine thymine cytosine guanine / A-T-G-C
	(ii)	gene (for insulin production) is switched off / inactive / not all genes are used in any one cell (1)	1	allow 'they are switched off', unless it is clear 'they' refers to cells ignore they are dormant not do not have (correct) gene / code ignore it's not their job
		Total	3	

Question	Expected Answers	Marks	Additional Guidance
5	<p>advantages maximum one from: can plan care for baby (1) can avoid conceiving in future (1) may be able to reduce effects by early treatment / change of lifestyle (1) know that other children / parents may also have the disorder (1) may choose to abort the foetus (1)</p> <p>disadvantages maximum one from: some people think it is against God to interfere / against religion / raises ethical issues (1) insurance companies may increase premiums (1) distressing for parent(s) (1) may force parents to make a difficult decision (1) may choose to abort the foetus / parents do not want to have the baby (1)</p>	2	<p>note abortion point may be given as advantage or disadvantage but only award once</p>
	Total	2	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	hair / fur (1)	1	allow external ears ignore produce milk
	(b)	lose less water / salts (1)	1	allow because water is in short supply allow do not have to drink so much / so often allow so do not dehydrate / stay hydrated allow do not lose (any) water (from sweating) ignore fluid
	(c)	mutualism / mutualistic (1)	1	allow symbiosis ignore mutual
	(d)	(genetic idea-) they have a common ancestor / have similar genes / DNA (1) (environmental idea -) they live in a similar habitat (so they have similar adaptations / similar behaviour) (1)	2	ignore they are related / have similar ancestors not have same DNA / genes allow both live in hot climates
	(e) (i)	they are different species (1)	1	allow different genus allow names show the genus and species ignore simply 'binomial classification'
	(ii)	any two from: (hybrids have) a mixture of (llama and camel) characteristics (1) (the hybrid is) not a (true) species (1) it is sterile / infertile / cannot reproduce / breed (1)	2	ignore a mixture of species ignore cannot mate
		Total	8	

Question			Expected Answers	Marks	Additional Guidance
7	(a)	(i)	population is increasing (1)	1	allow more growing of crops for biofuel / more demand for food
		(ii)	any one from: legal protection / ban hunting / AW (1) education programmes (1) (captive) breeding (1) remove predators / competitors (1)	1	allow reduce / stop use of pesticides ignore any reference to protecting where they live e.g. zoos / artificial ecosystems / reserves / protected areas ignore provide food ignore unqualified references to conservation programmes
	(b)	(i)	pollination (1)	1	allow greater yield / more fruit set / fertilisation ignore honey ignore help plants breed / reproduce
		(ii)	produce nectar (1)	1	allow scented / smell ignore pollen ignore colour / petals
	(c)		nitrates (1)	1	allow compounds of nitrogen / compounds of N ignore nitrogen / N / N ₂
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
8	(a)	population (1)	1	more than 1 answer = 0
	(b) (i)	50 (1)	1	
	(ii)	increases / goes up (1) less were eaten (by the wolves) (1)	2	allow less wolves to eat them / fewer predators not none were eaten / no wolves eating them ignore just 'less wolves'
	(c)	max three from: idea of variation, e.g. some are better adapted than others / mutations (1) idea of survival of the fittest / survival of better adapted individuals (1) idea of inheritance / passing on (successful) genes / characteristics (1)	3	allow natural selection as an alternative to either first or second marking point ignore simply 'they become adapted' allow idea of accumulation of many small changes (may produce a new species) (1)
Total			7	

Question	Expected Answers	Marks	Additional Guidance
9 (a)	<p>any two from: (plant cells) have chloroplasts / chlorophyll (1) (plant cells) have cell wall / cellulose (1) (plant cells) have (large) vacuole (1)</p>	2	<p>assume answer refers to plants unless otherwise stated allow show turgor</p> <p>allow (plant cells) make their own food / photosynthesise (1) allow starch grains / store starch (1) ignore references to shape ignore references to leaves e.g. have stomata</p>
(b)	diffusion (1)	1	<p>allow transpiration / evaporation not osmosis</p>
(c)	two chromatids drawn in each new cell (1)	1	 <p>should be one smaller and one larger in each cell, but give BOD unless they are clearly identical</p>
Total		4	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	thin wall to increase rate of exchange of materials / 3 rd box (1)	1	more than one tick = 0
	(b)	(i) artery (1)	1	allow aorta ignore arteriole
		(ii) prevent backflow / make sure blood flows in correct direction / stop blood flowing in wrong direction (1)	1	allow they allow pressure to build up when they close ignore control blood flow
	(c)	any two from: no nucleus (1) contains haemoglobin (1) thin / (partial) permeable membrane (1) small (size) (1) biconcave / disc shaped (1) flexible / can change shape (1) large surface area (compared to volume) (1)	2	allow contain iron not thin / (partial) permeable walls allow 'donut' shaped ignore round /dented
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	<p>no (no mark) experiment is about light (not gravity) / geotropism is response to gravity (not light) / shoots are growing towards the light / shoots are growing upwards / are negatively geotropic / shows shoots are positively phototropic / shoots would grow down if positively geotropic / roots are positively geotropic (1)</p>	1	must have answered no and given correct explanation for mark
	(b) (i)	auxin (1)	1	<p>allow IAA not axon</p>
	(ii)	<p>collects on dark side / higher concentrations on dark side / ORA (1)</p> <p>causes <u>cells</u> (on dark side) to elongate (1)</p>	2	<p>allow light destroys / inactivates auxin (on light side) ignore produced on dark side</p> <p>allow makes cells more elastic allow makes cells grow (bigger) not makes cells divide / more cells ignore dark side elongates</p>
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
12	(a)	as temperature increases time decreases from (20 °C to 40 °C) then it increases again (1)	1	allow as temperature increases rate increases (from 20 °C to 40 °C) then it decreases again / as temperature increases speeds up then slows down time decreases then increases (i.e. no link to temperature) = 0
	(b)	40 (°C) (1)	1	allow any answer in range 31 - 49 (°C)
	(c)	it is denatured / changes shape (1)	1	allow active site changes shape / cannot join to substrate / bonds within enzyme broken ignore enzyme destroyed / damaged not enzyme killed
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
13	(a)	insertion (1)	1	allow ringed answer if no answer on line
	(b)	so that AAT is made in the milk / AW (1)	1	allow so both genes are switched on / expressed together
	(c)	any two from: remove the nucleus from an egg (1) put the (udder cell) nucleus into the egg (1) electric shock given (1) cell divides (1)	2	order not important ignore give shock to embryo
		Total	4	

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