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BIOLOGY
Unit 4
Trial Examination

SOLUTIONS BOOK

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Phone: 61 + 3 9385 3999 • Fax: 61 + 3 9386 6722 • Email: stav@stav.vic.edu.au Website: http://www.stav.vic.edu.au

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SEMESTER 2

Use this page as an overlay for marking the multiple choice answer sheets. Simply photocopy the page onto an overhead projector sheet. The correct answers are open boxes below. Students should have marked their answers with a cross. Therefore, any open box with a cross inside it is correct and scores 1 mark.

1.	A	B		D
2.		B	C	D
3.	A	B	C	
4.	A		C	D
5.	A		C	D
6.	A	B	C	
7.	A	B		D
8.	A	B	C	
9.	A		C	D
10.	A	B		D
11.	A	B		D
12.	A		C	D
13.	A	B		D

14.		B	C	D
15.	A		C	D
16.		B	C	D
17.	A	B		D
18.	A		C	D
19.	A		C	D
20.	A	B		D
21.		B	C	D
22.	A	B	C	
23.	A	B		D
24.	A	B	C	
25.		B	C	D

TEACHERS, PLEASE NOTE:

In marking the Exam, teachers should keep in mind that the language used in the suggested answers is sometimes more sophisticated than a student would offer, since these answers are written for teachers' information in their correction of the Exam.

The answers suggested here might not be the only correct responses possible. Teachers must use their professional judgement in awarding marks for other answers offered. However, in accordance with the VCAA practice, students who give a correct response, and then offer a contradictory incorrect response within the same part of the question, should ***not*** *be awarded any marks for the correct part of the response. Also in accordance with the VCAA practice, no half marks should be given.*

SECTION A - MULTIPLE CHOICE QUESTIONS (1 mark each: 25 marks)

1	*C*	*16*	*A*
2	*A*	*17*	*C*
3	*D*	*18*	*B*
4	*B*	*19*	*B*
5	*B*	*20*	*C*
6	*D*	*21*	*A*
7	*C*	*22*	*D*
8	*D*	*23*	*C*
9	*B*	*24*	*C*
10	*C*	*25*	*A*
11	*C*		
12	*B*		
13	*C*		
14	*A*		
15	*B*		

SECTION B - WRITTEN RESPONSES

Question 1

a *Chlorophyll* *1 mark*

b *Chlorophyll is essential for photosynthesis (1). Without being able to photosynthesize, these plants will be unable to grow and therefore will not grow to maturity (1).* *2 marks*

c *The heterozygote plant C^GC^Y does not have the dominant phenotype but is a combination of the phenotypes of the homozygote (1). The most likely inheritance is therefore co-dominant as both alleles are expressed (1).* *2 marks*

d C^GC^G *x* C^GC^Y

½ C^GC^G + *½* C^GC^Y *(1)*

Half would be dark green and half would be light green (1). *2 marks*

e

	C^G	C^G	C^G	C^Y
C^G	C^GC^G	C^GC^G	C^GC^G	C^GC^Y
C^G	C^GC^G	C^GC^G	C^GC^G	C^GC^Y
C^G	C^GC^G	C^GC^G	C^GC^G	C^GC^Y
C^y	C^GC^Y	C^GC^Y	C^GC^Y	~~C^YC^Y~~

1 mark for correct working

9/15 dark green, 6/15 light green. (2 marks for correct phenotype and their correct ratios.)
(Note that C^YC^Y cannot survive)

3 marks

Total Question 1: 10 marks

Question 2

a	*Inbreeding reduces genetic variation in the offspring which can decrease the chance of the species' survival in a changing environment.*	*1 mark*
b	*Two*	*1 mark*
c	*One*	*1 mark*
d	*S^1S^3 and S^1S^2*	*1 mark*
e	*The ratio would be 1:1 of S^1S^2 to S^1S^3*	*1 mark*
	Total Question 2:	***5 marks***

Question 3

a	*Cytosine and Guanine (both with correct spelling for one mark.)*	*1 mark*
b	*UAG is not part of the DNA molecule (1) as it contains the nitrogen base uracil which is only found in RNA (1).*	*2 marks*
c	*Tyrosine* *Stop codon*	*2 marks*
d	*The polypeptide will be terminated at the stop codon, therefore the polypeptide chain will be shortened.*	*1 mark*
	Total Question 3:	***6 marks***

Question 4

a	*The condition is autosomal (on chromosome 6) (1) and is recessive, as generation **I** who do not have the condition have given rise to individual **II** 1 who does (1).*	*2 marks*
b	*Linked marker means that there is a gene or section of DNA (the marker) on the same chromosome as the disease gene (1) and this piece of DNA shows different forms in the population (1).*	*2 marks*
c	*Individual **II** 1 must have inherited a mutated CAH allele associated with marker B7 from the father and a mutated CAH allele associated with B2 from the mother resulting in the condition (1). Individual **II** 3 has inherited a B7 defective allele from the father but a B7 from the mother which is not associated with a defective CAH allele, (1) therefore the unborn child will be a heterozygous carrier of CAH but will not have the condition (1).*	*3 marks*
d	*The indirect diagnosis relies on the inheritance of the defective allele with the marker (1). If the defective allele is situated too far away from the marker on the chromosome there is more of a chance that crossing over will occur during meiosis (1) and the defective allele may end up on the chromosome carrying the normal allele for that gene (1).*	*3 marks*
	Total Question 4:	***10 marks***

Question 5

a	*Founder population.*	*1 mark*
b	*The gene pool of a founder population will be made up of only the small number of alleles that the founder individuals have and hence offers little genetic diversity.*	*1 mark*
c	*Tasmania was already separated from the mainland of Australia when the dingo arrived in Australia.*	*1 mark*
d	*Direct competition for food.* *Possible partnership between the dingo and the aborigines would have meant even more competition for the thylacine. (Any reasonable answer will score 1 mark).*	*1 mark*
e	*The mtDNA undergoes mutations at a particular rate. The more mutations there are in the mtDNA of the dingo, the further removed they are from their closest relatives (1). The amount of variation is roughly equal to the time that has passed (1).*	*2 marks*
f	*The comparison of fossil bones of the dingo, such as the skull, with fossils of the Asian domestic dogs.*	*1 mark*
g	*Both the dingo and the domestic dog have descended from the grey wolf (1) and are close enough to be classified as a sub-species of each other. This closeness is enough to enable them to interbreed to form fertile offspring (1).*	*2 marks*
	Total Question 5:	***9 marks***

Question 6

a	*Answers could include: Reduction in size of teeth* *Increase in brain size* *Flattened face (any two of these for 2 marks)*	*2 marks*
b	*The possession of long arms would infer that Homo floresiensis probably frequently climbed trees, possibly for safety.*	*1 mark*
c	*Fossilized bones are bones that have been turned to stone by impregnation of minerals and are therefore altered forms of normal bones.*	*1 mark*
d	*Bones that are not fossilized are able to be examined for DNA whereas fossilized bones cannot.*	*1 mark*
e	*Mammals in hot humid conditions need cooling (1). The smaller the mammal the larger the surface area to volume ratio thus enabling the mammal to lose heat more effectively to its surroundings (1), therefore small size would be selected for.*	*2 marks*
f	*Islands often have a limited food supply and fewer predators, therefore survival would depend on minimizing daily energy requirements (1) therefore small size requiring less energy would be selected for (1).*	*2 marks*
g	*Being so small, Homo floresiensis must have hunted in groups using communication and planning in order to kill and drag to their cave an animal as big as a stegadon.*	*1 mark*
	Total Question 6:	***10 marks***

Total Section B: ***50 marks***

Total examination: ***75 marks***

END OF SUGGESTED SOLUTIONS