SCIENCE TEACHERS ASSOCIATION VICTORIA 2022

TRIAL EXAMINATION

BIOLOGY
UNIT 2

Founded 1943

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 shaded their answers. Therefore, any open box with shading inside it is correct and scores 1 mark.

ONE ANSWER PER LINE		ONE ANSWER PER LINE
1 ▮▮▮ □	14 □ ▮▮▮
2 ▮▮ □ ▮	15 □ ▮▮▮
3 ▮▮▮ □	16 □ ▮▮▮
4 ▮▮▮ □	17 □ ▮▮▮
5 ▮ □ ▮▮	18 ▮▮▮ □
6 ▮▮ □ ▮	19 ▮ □ ▮▮
7 ▮▮ □ ▮	20 ▮▮▮ □
8 ▮▮ □ ▮	21 ▮▮ □ ▮
9 ▮▮▮ □	22 □ ▮▮▮
10 ▮ □ ▮▮	23 ▮▮▮ □
11 □ ▮▮▮	24 □ ▮▮▮
12 ▮▮▮ □	25 ▮▮▮ □
13 ▮▮▮ □	

TEACHERS, PLEASE NOTE:

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

SECTION B

Question 1

a metaphase II   1 mark
b anaphase II   1 mark
c a nucleus with a single set of chromosomes   1 mark
d 46 chromosomes (23 pairs)   1 mark
e *During meiosis chromosome 21 fails to separate at the centromere (1) causing a gamete cell to have 2 copies of chromosome 21 (1). When the gametes meet, the final fertilised cell ends up with 3 copies of chromosome 21 (1).*   3 marks
f *Pregnancies diagnosed with Down Syndrome were not carried to term.*   1 mark

Total Question 1: 8 marks

Question 2

a *dd*   1 mark
b *any one of the following for 1 mark: lack of water OR nutrients OR sunlight*   1 mark
c *recessive trait*   1 mark
d *Recessive (white) traits when self-pollinated will remain recessive homozygous white (1). Recessive white crossed with red had 100% red. Therefore, red is a dominant trait and white is recessive (1).*   2 marks
e *DD*   1 mark
f *Incomplete dominance occurs when neither trait is fully expressed (1). As the final seeds are either red or white (not pink or patches) (1) it is not incomplete dominance.*   2 marks
g *When two genes are located on the same chromosome (1), and are inherited together (1).*   2 marks

Total Question 2: 10 marks

Question 3

a   structural adaptation: flat tail / webbed feet (1) – able to swim fast to catch prey to eat
to survive (1)
OR spur (1) – to inject poison (1)
OR sensors to detect pressure or electrical activity (1) – detect prey to eat to survive (1)
physiological adaptation: redirect blood flow (1) – prevent heat loss (1)
behavioural adaptation: avoids contact (1) – survive predators (1)   *6 marks*

b   chromosomes that determine the sex of an organism   *1 mark*

c   autosome   *1 mark*

d   Low density can make it difficult for animals to find a mate (1) reducing the number of
offspring in each generation (1).   *2 marks*

e   Lack of genetic diversity means most individuals have similar alleles (1). A disease or
predator that affects one individual, will affect all of them (1). Therefore, a single
disease could kill every organism in a population (1).   *3 marks*

    Total Question 3: 13 marks

Question 4

a   The quoll population would decrease as they ate the spreading poisonous cane toads.   *1 mark*

b   Any two of the following for one mark each:
- birds, rodents, invertebrates, frogs, reptiles or plants increase
- kites, feral cats, dingoes, owls or snakes decrease   *2 marks*

    Total Question 4: 3 marks

Question 5

a   If the temperature that the turtles eggs are incubated at is decreased from 28°C to 27°C,
then the proportion of male turtles that will be born will increase to 60% because
temperatures higher than 28°C increase the number of females.   *1 mark*

b   Large sample size (>50 eggs) (1)
Divide into two groups: one group at 28°C, the other at 27°C (1)
Maintain water, sand, sunlight etc at same conditions (1)
Measure the proportion of hatched males and females in each group (1)   *4 marks*

c   an environmental influence that affects the phenotype   *1 mark*

    Total Question 5: 6 marks

Question 6

a   homozygous: having two identical alleles for a particular gene (1)
heterozygous: having two different alleles of a particular gene (1)   *2 marks*

b   Perform a test cross (1).
Breed a long haired cat with a short haired cat (ll – homozygous recessive) (1).
The phenotypes of the offspring will show if the recessive allele is present in the new long
haired cat (1).

	L	l
l	Ll long hair	ll short hair
l	Ll long hair	ll short hair

(1)

	L	L
l	Ll long hair	Ll long hair
l	Ll long hair	Ll long hair

(1)

    5 marks

c   parthenogenesis   *1 mark*

d   *advantage: any one of the following for one mark:*
- *able to reproduce quickly without a partner*
- *populate an area quickly*
- *conserve energy from not needing to find a mate*

disadvantage: any one of the following for one mark:
- *reduced genetic diversity*
- *changes in environment could affect all individuals*
- *overcrowding lead to increase competition for resources*
- *unhealthy mutations are inherited*
- *susceptible to disease*   *2 marks*

Total Question 6: 10 marks

Total Section B: 50 marks

Total Trial Exam: 75 marks

END OF SUGGESTED SOLUTIONS