







Section 1	Section 2	Section 3	Total
 /24	 /18	 /28	 /70

SECTION ONE: Genotypes and Phenotypes

(24 marks)

Answer the questions in the spaces provided.

** 1 mark / correct response*

1. For each genotype below, indicate whether it is heterozygous (He) or homozygous (Ho): (6 marks)

a. AA HO

c. Cc HE

e. Ee HE

b. Bb HE

d. DD HO

f. ff HO

2. For each of the **genotypes** below, determine what **phenotypes** would be possible: (12 marks)

a. Purple flowers are dominant to white

flowers

PP Purple

Pp Purple

pp White

c. Round seeds are dominant to wrinkled

seeds

RR Round

Rr Round

rr Wrinkled

b. Brown eyes are dominant to blue eyes

BB Brown

Bb Brown

bb Blue

d. Bobtails in cats are recessive

TT Normal (Non-bobta)

Tt Normal

tt Bobtail

3. For each **phenotype** below, list the **genotypes**:

(6 marks)

(HINT: remember to use the letter of the dominant trait)

a. Straight hair is dominant to curly hair

Hh straight

Hh straight

hh curly

b. Pointed heads are dominant round heads

PP pointed HH

Pp pointed Hh

pp round hh

SECTION TWO: Simple Inheritance

(18 marks)

Answer the questions in the spaces provided.

4. Set up the Punnett squares for each of the crosses listed below, then answer the relevant questions:

a. A tall (TT) plant is crossed with a short (tt) plant.

(3 marks)

①

	T	T
t	Tt	Tt
t	Tt	Tt

① all correct.

i. What percentage of the offspring will be tall? 100 %

(1 mark)

b. A tall (Tt) plant is crossed with a tall (Tt) plant.

(3 marks)

	T	t
T	TT	Tt
t	Tt	tt

i. What percentage of the offspring will be short? 25 %

(1 mark)

- c. A heterozygous round seeded plant (Rr) is crossed with a homozygous round seeded plant (RR).

(3 marks)

	R	R
R	RR	RR
r	Rr	Rr

- i. What percentage of the offspring will be homozygous (RR)? 50 % (1 mark)

- d. A homozygous round seeded plant is crossed with a homozygous wrinkled seeded plant.

(3 marks)

	R	R
W	RW	RW
w	Rw	Rw

- i. What are the genotypes of the parents? RR x WW (2 marks)

- ii. What percentage of the offspring will also be homozygous? 0 % (1 mark)

SECTION THREE: Dominant and Recessive Crosses

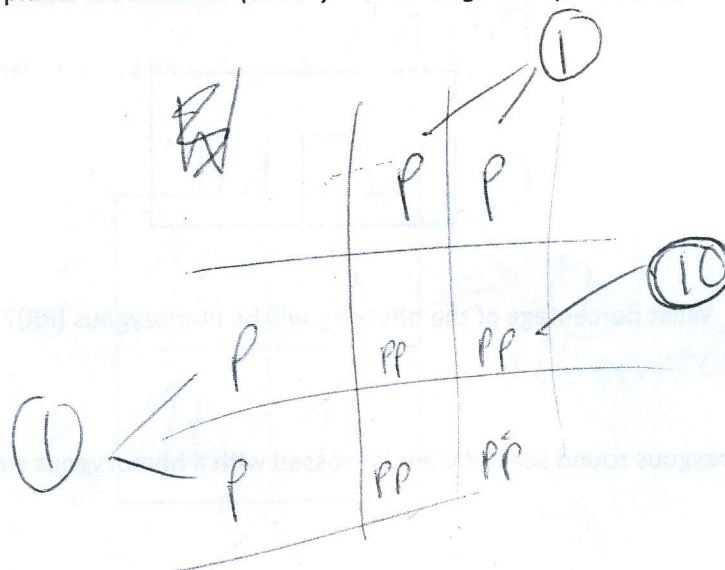
(28 marks)

Answer the questions in the spaces provided.

5. In pea plants, purple flowers are dominant to white flowers.

a. Two white flowered plants are crossed. (Show your working below)

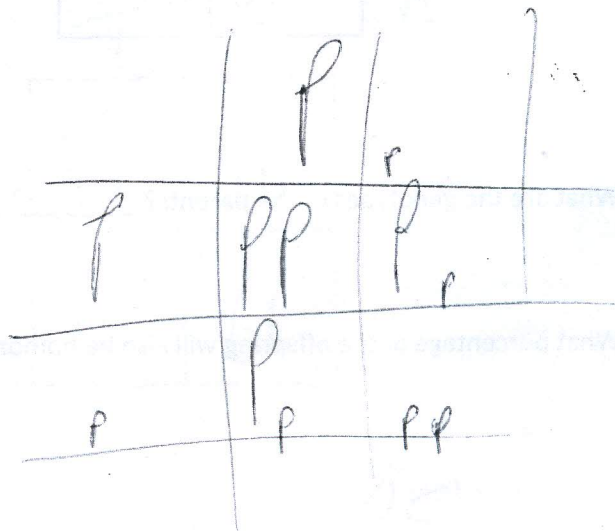
(4 marks)



i. What percentage of their offspring will be white flowered? 100 % (1 mark)

b. Two plants, both heterozygous for the gene that controls flower colour, are crossed. (Show your working below)

(4 marks)



i. What percentage of their offspring will have purple flowers? 75 % (1 mark)

ii. What percentage of their offspring will have white flowers? 25 % (1 mark)

6. In guinea pigs, the allele for short hair is dominant.

a. Write the **genotypes** for the following **phenotypes**:

(3 marks)

i. Heterozygous short haired

Hh

ii. Homozygous short haired

HH

iii. Long haired

hh

b. Show the cross for a homozygous short haired guinea pig and a long haired guinea pig. (Show your working below)

(3 marks)

	H	H
h	Hh	Hh
h	Hh	Hh

i. What percentage of the offspring will have short hair? 100 %

(1 mark)

c. Show the cross for two heterozygous guinea pigs. (Show your working below)

(3 marks)

	H	h
H	HH	Hh
h	Hh	hh

i. What percentage of the offspring will have short hair? 75 %

(1 mark)

ii. What percentage of the offspring will have long hair? 25 %

(1 mark)

- d. Two short haired guinea pigs are mated several times. Out of 100 offspring, 25 of them have long hair. What are the probable genotypes of the parents? (5 marks)

hybrids
Show the cross to prove it!

	H	h	①
H	HH	Hh	①
h	Hh	hh	①

① punnett