

## Inheritance – 2022 November O Level 5090

### 1. Nov/2022/Paper\_11/No.37

A variety of snail has an inherited condition that affects the thickness of the shell.

$S^t S^t$  have thick shells.

$S^t S^n$  have thin shells.

$S^n S^n$  do not survive.

Two heterozygous snails are mated.

What is the probability that a surviving snail of the next generation is a heterozygote?

A 0.00      B 0.25      C 0.50      D 0.67

### 2. Nov/2022/Paper\_11/No.38

A man of blood group A and his wife of blood group O had two children, both of blood group A. The man concluded that he must be homozygous for the allele  $I^A$ , since he thought half his children would be of group O if he were heterozygous.

Why was his conclusion unsound?

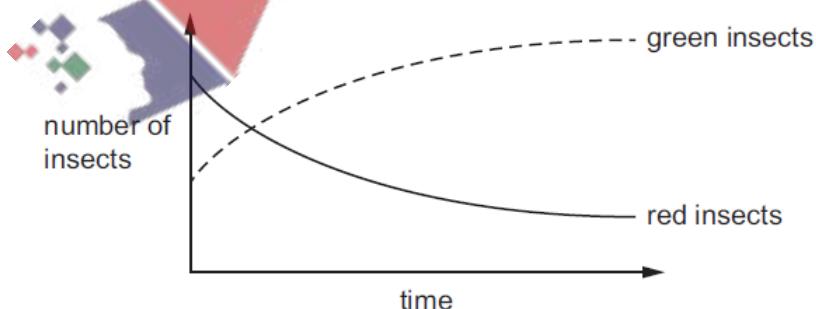
A Blood group mutations are common.  
B Genetic ratios are unreliable for small numbers.  
C His wife might have been heterozygous.  
D The expected ratio for a heterozygous father and group O mother is 3 group A:1 group O.

### 3. Nov/2022/Paper\_11/No.39

In a garden there is a species of insect which can be either red or green in colour. The green insects are well camouflaged.

Birds that eat insects start to live in the garden.

The graph shows how the populations of red and green insects then change.



What is this an example of?

A artificial selection  
B continuous variation  
C incomplete dominance  
D natural selection

4. Nov/2022/Paper\_12/No.35

Human gametes are different from each other.

Which information about male gametes is correct?

	size	numbers released at one time	movement
A	large	normally one	cannot move on their own
B	large	millions	cannot move on their own
C	small	normally one	can swim
D	small	millions	can swim

5. Nov/2022/Paper\_12/No.37

What is the correct order for the sizes of the pieces of genetic material shown in the table, from smallest to largest?

	smallest	→	largest
A	gene	molecule of DNA	chromosome
B	molecule of DNA	gene	chromosome
C	chromosome	molecule of DNA	gene
D	gene	chromosome	molecule of DNA

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7. Nov/2022/Paper\_21/No.3(a)

Guinea pigs are small mammals. In some countries they are produced for food and in others they are bred as pets.

(a) Guinea pigs can have either straight hair or curly hair. The allele for straight hair, T, is dominant to the allele for curly hair, t.

(i) Explain the difference between a gene and an allele.

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.....  
.....

[2]

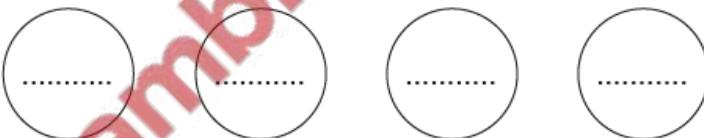
(ii) A breeder has two straight-haired guinea pigs, male and female, and is surprised when one of the offspring has curly hair.

Complete the genetic diagram to show how this is possible.

genotypes of parents

..... x .....

gametes



possible offspring genotypes .....

possible offspring phenotypes .....



[4]

**8. Nov/2022/Paper\_22/No.3b(i)**

(i) Suggest, with reference to the adaptations shown in the photograph, how the structures labelled **Q** are dispersed by animals.