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education

Department of Education
FREE STATE PROVINCE

PREPARATORY EXAMINATION

GRADE 12

LIFE SCIENCES P2

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answer to EACH question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You must use a non-programmable calculator, protractor and a compass, where necessary.
11. Write neatly and legibly.

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SECTION A

QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A to D) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, for example, 1.1.11 D.

1.1.1 Which ONE of the following represents a single RNA nucleotide?

A Deoxyribose-adenine-thymine
B Adenine-ribose-phosphate
C Deoxyribose-thymine-phosphate
D Uracil-deoxyribose-phosphate

1.1.2 What percentage of adenine bases is present in a DNA molecule with 2000 bases if 400 bases are cytosine?

A 20
B 40
C 30
D 60

1.1.3 Which organelle is responsible for producing spindle fibres?

A Nucleus
B Centromere
C Centriole
D Chromosome

1.1.4 Which ONE of the following represents the correct order for the possible evolution of modern humans?

A Ardipithecus → Australopithecus → Homo
B Australopithecus → Ardipithecus → Homo
C Homo → Australopithecus → Ardipithecus
D Ardipithecus → Homo → Australopithecus

1.1.5 Which ONE of the following represents a trend in human evolution?

A More developed brow ridges
B Increased size of canines
C More developed cranial ridges
D More forward position of the foramen magnum

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1.1.6 Which ONE of the following distinguishes prophase I of meiosis from prophase of mitosis?

A Homologous chromosomes pair up
B Spindle forms
C Nuclear membrane breaks down
D Chromosomes become visible

1.1.7 When a cell divides by meiosis, it results in …

A four haploid gametes.
B two diploid gametes.
C four haploid somatic cells.
D two haploid somatic cells.

1.1.8 Comparison of the amino acid sequences in a protein have been made between humans and several other organisms. The number of differences is shown in the table below.

ORGANISM	SHARK	KANGAROO	FISH	COW	LIZARD
Number of differences in amino acids sequences in a protein compared to humans	79	27	68	17	62

The type of evidence for evolution in the table above is …

A fossil evidence.
B modification by descent.
C cultural evidence.
D genetic evidence.

1.1.9 Down syndrome occurs when …

A a male sex cell undergoes mitosis.
B every cell of an organism has an extra pair of chromosomes.
C all somatic cells of an organism have an extra chromosome.
D a female sex cell undergoes mitosis.

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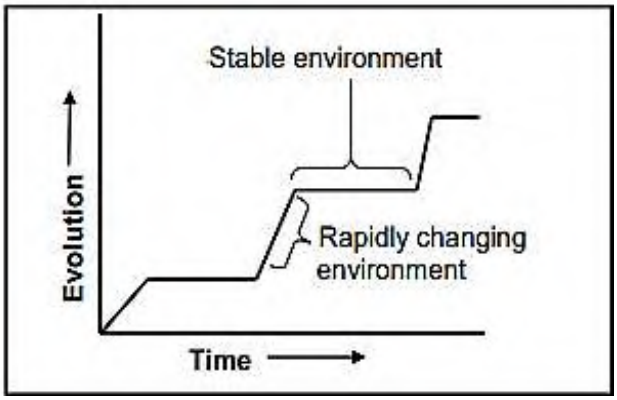
1.1.10 The graph below shows the pace at which evolution occurs in a species of butterfly.



Which type of evolution is represented by the graph?

A Speciation
B Inheritance of acquired characteristics
C Punctuated equilibrium
D Artificial selection

(10 x 2) **(20)**

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question numbers (1.2.1 to 1.2.10) in the ANSWER BOOK.

1.2.1 A section of DNA that carries the code for a particular trait

1.2.2 The production of gametes during meiosis

1.2.3 A diagram showing possible evolutionary relationships

1.2.4 The allele that is expressed in the phenotype in the heterozygous condition

1.2.5 The study of animal and plant distribution as a form of evidence for evolution

1.2.6 A group of organisms that share the same gene pool and that can interbreed to produce fertile offspring

1.2.7 A characteristic of primates that enables them to have precision in grip

1.2.8 A set of well-tested ideas that explains a phenomenon in science and is supported by sufficient experimental evidence

1.2.9 The mistake that occurs when two homologous chromosomes do not separate from each other during meiosis

1.2.10 The type of dominance where a long-tailed dog and a short-tailed dog produces a puppy with a medium length tail

(10)

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1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question numbers (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	A place in the plant cell where DNA is found	A: Nucleus B: Mitochondrion
1.3.2	The evidence used to support the 'Out of Africa' hypothesis by tracing the maternal lineage	A: Mitochondrial DNA B: Y- chromosome DNA
1.3.3	Phase during which cytokinesis takes place	A: Telophase I B: Telophase II

(3 x 2) **(6)**

1.4 In watermelons, there are two alleles for taste, bitter fruit and sweet fruit. The allele for bitter fruit **(B)** is dominant over the allele for sweet fruit **(b)**. There are two alleles for skin appearance, yellow spots and no spots. The allele for yellow spots **(N)** is dominant over the allele for no spots **(n)**.

Plant **A**, which is heterozygous for bitter fruit and for yellow spots, was crossed with plant **B**, which has sweet fruit and no spots.

1.4.1 Give the term that describes a genetic cross involving two characteristics. (1)

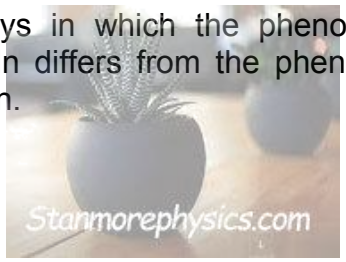
1.4.2 Give:

(a) The genotype of plant **B** (2)

(b) The dominant phenotype for taste in watermelons (1)

(c) All possible genotypes of the gametes of plant **A** (2)

1.4.3 List TWO ways in which the phenotype of a watermelon with genotype bbNn differs from the phenotype of a watermelon with genotype Bbnn. (2)
(8)



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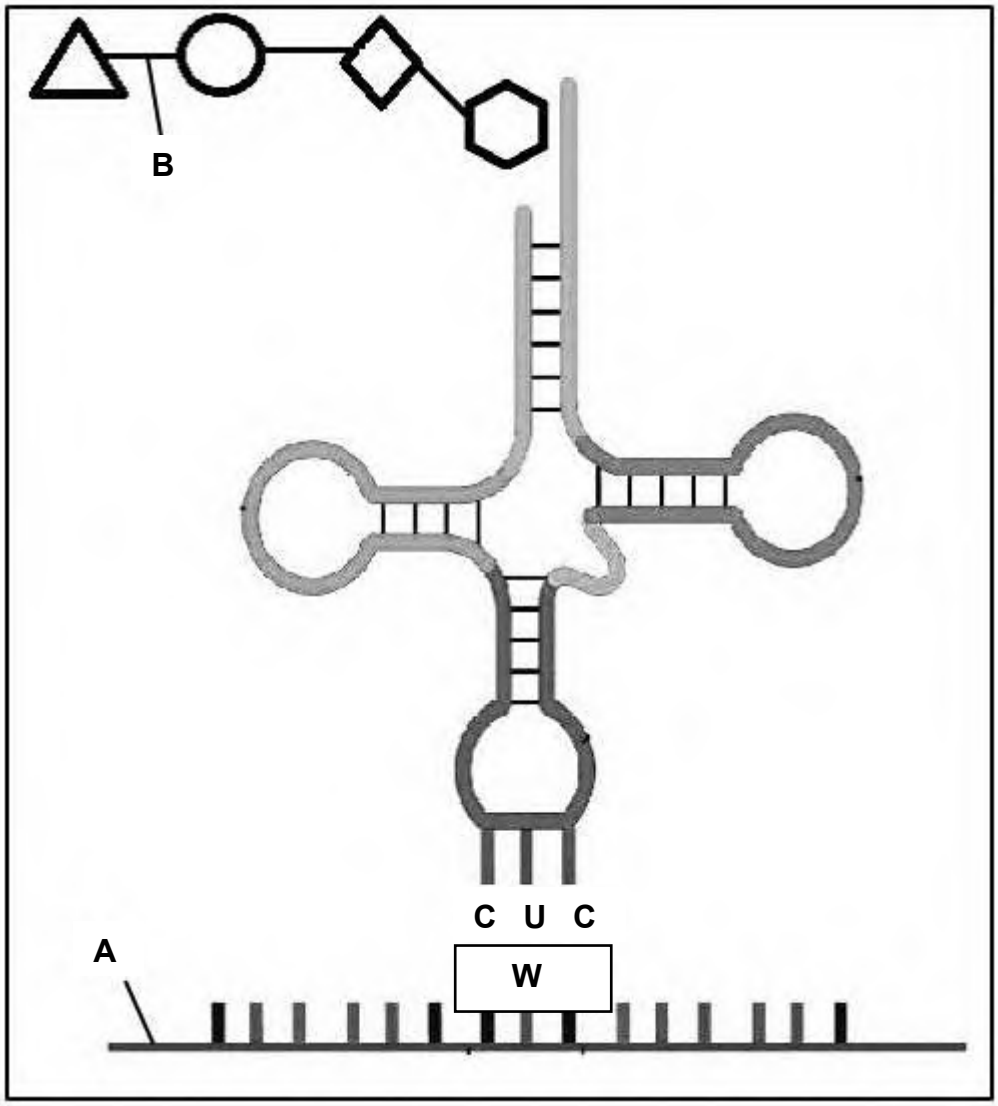
1.5 The diagram below show two molecules that are required during proteins synthesis.



1.5.1 Identify:

(a) Molecule **A** (1)

(b) The bond at **B** (1)

(c) The base triplet sequences for **W** (2)

1.5.2 Name the organelle at which this phase of protein synthesis takes place. (1)

1.5.3 Name the nitrogenous base represented by **U** in the diagram. (1)
(6)

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 The table below shows the anticodons of tRNA, that carry specific amino acids during protein synthesis.

Number	Amino Acid	tRNA
1	Alanine	CGA
2	Valine	GUA
3	Aspartic acid	CUA
4	Valine	CAC
5	Glutamine	CUC
6	Arginine	GCC
7	Cysteine	UGC
8	Threonine	UCC
9	Histidine	CAG
10	Tryptophan	ACC
11	Tyrosine	AUA

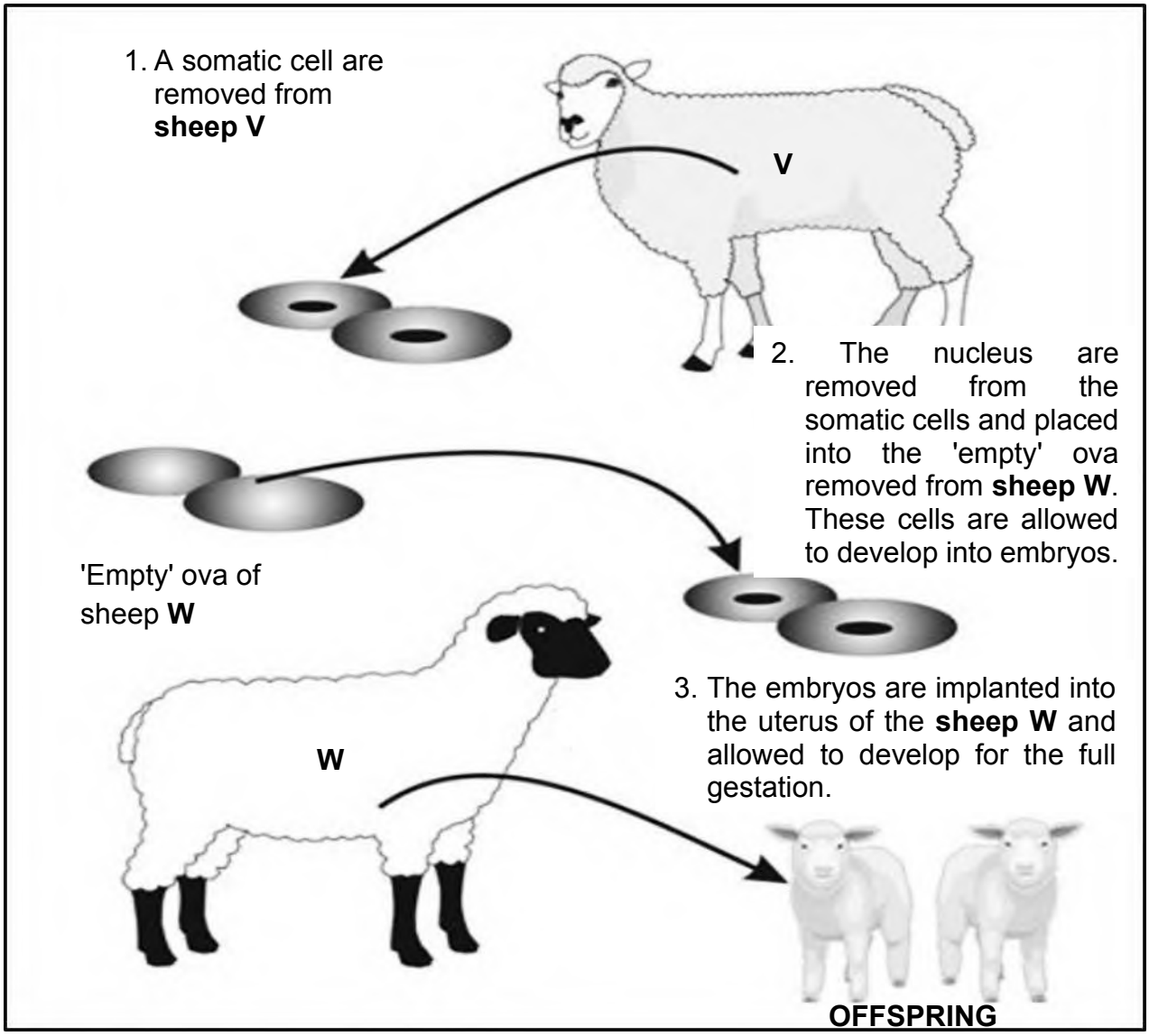
2.1.1 Write down the DNA base triplet that codes for the amino acid Valine at **number 2**. (2)

2.1.2 From the table, write down the names of two amino acids which are coded for by thymine (T) as the first base in the DNA triplets. (2)

2.1.3 Name AND describe the process that occurred in the cytoplasm, which led to amino acid **number 11** becoming part of a protein. (5)
(9)

2.2 Tabulate any TWO structural differences between DNA and RNA. **(5)**

2.3 The diagrams below show how a sheep was cloned.



2.3.1 What is a somatic cell? (2)

2.3.2 Why is the nucleus from the ovum of sheep **W** removed? (1)

2.3.3 Explain why the lambs produced by the technique are identical to each other. (4)

2.3.4 Give ONE reason why the lambs are not genetically identical to sheep **W**, which produced the ova. (1)

2.3.5 State TWO reasons why cloning livestock be can beneficial to humans. (2)

2.3.6 Give ONE reason why some people may be against cloning. (1)
(11)

2.4 Mr and Mrs Wilson are concerned because their baby boy does not appear to resemble either of them. They suspected that the baby they were given at the hospital is not theirs. Mr Wilson has blood type **AB**, Mrs Wilson has blood type **B.** Their daughter has blood type **A**. The baby boy they were given, has blood type **O**. They learn that blood groups are determined by multiple alleles – and that there are four phenotypes for blood groups.

2.4.1 Describe how multiple alleles determine blood groups. (2)

2.4.2 Give the genotype of the daughter. (2)

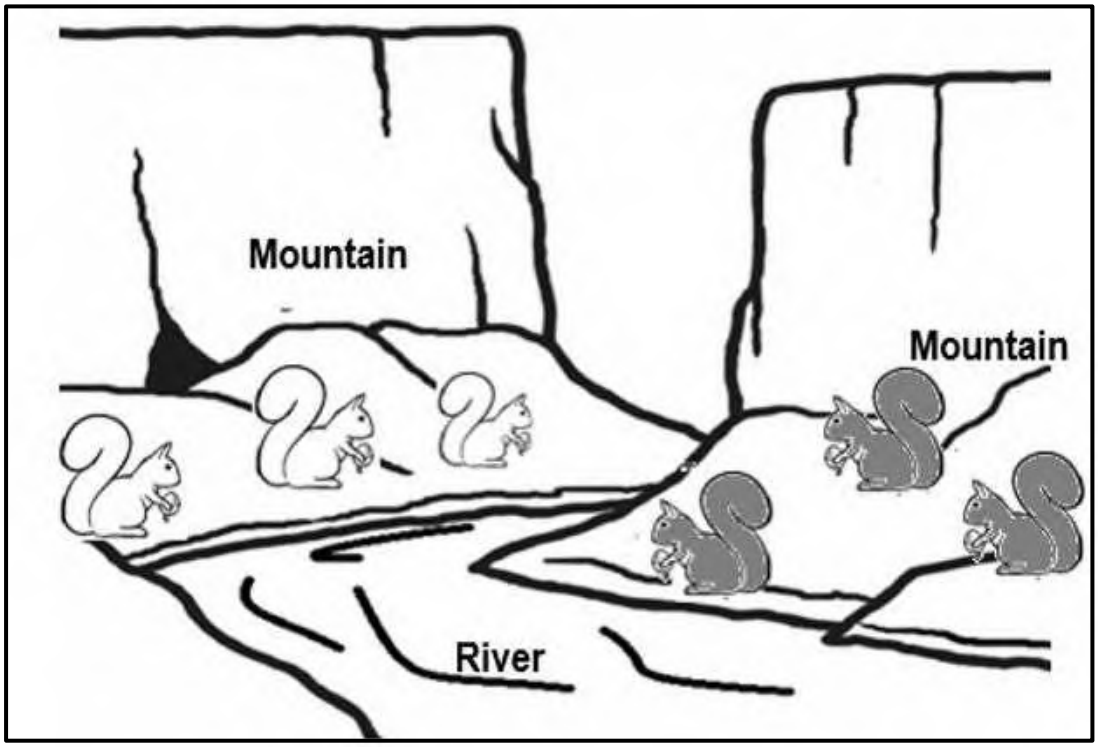
2.4.3 Explain why the baby boy with blood type **O,** cannot be Mr and Mrs Wilson's biological son. (3)

2.4.4 Blood types are not conclusive in paternity testing.

Explain how DNA profiling could be used to determine that Mr Wilson is the father of the daughter. (4)
(11)

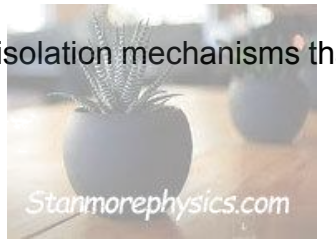
2.5 Using your knowledge of gonosomes, explain why the sex of a child is determined by the male gamete. **(4)**

2.6 A population of squirrels lived in the mountains. A landslide caused the river to change direction, thereby separating the populations into two groups on either side of the river. Over a long period of time, the two populations became different species.



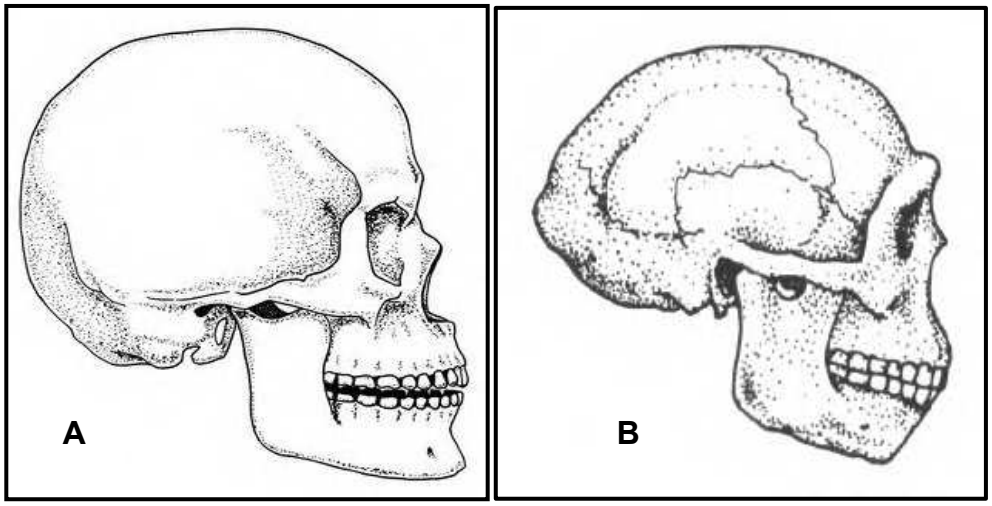
2.6.1 Describe the process of speciation in the squirrels. (7)

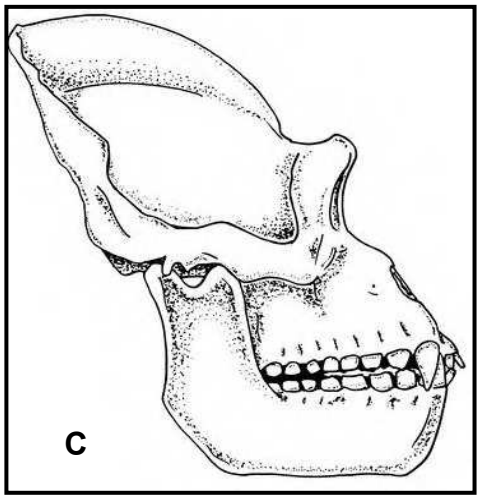
2.6.2 Give THREE reproductive isolation mechanisms that help to keep species separate. (3)
(10)
[50]



QUESTION 3

3.1 The diagrams below show the skulls of three primate genera.
The diagrams are NOT drawn to scale.





3.1.1 Give the LETTER only of a skull that:

(a) Most likely belongs to a bipedal organism (1)

(b) Is attached to a C-shaped vertebral column (1)

(c) Is most prognathous (1)

(d) Has the largest brain size (1)

3.1.2 State TWO advantages of having a large brain. (2)

3.1.3 State any THREE features of skull **B** shown in the diagram above that allows scientists to determine that this was a much earlier species of genus *Homo* than modern humans. (*H. sapiens sapiens*.) (3)

3.1.4 Name TWO lines of evidence that support the idea that humans originated on the African continent. (2)
(11)

3.2 *Brassica* plants have hair on their leaves to reduce transpiration. The number of hairs on the leaves varies from plant to plant.

An investigation was conducted to determine whether artificial selection could increase the number of plants with more hair on their leaves.

The students carried out the following procedure:

- 180 *Brassica* plants were selected randomly.
- The number of hairs present on the edge of each mature leaf was counted per plant, and an average was calculated.
- The number of plants, with different averages, was counted and recorded.
- The plants with more than 25 hairs per leaf were separated from the rest of the group and allowed to cross-pollinate.
- The seeds produced by these plants were germinated and allowed to grow into mature plants. 180 of these plants were selected randomly.
- The number of hairs present on the edge of mature leaves was counted per plant and the average number of hairs was calculated again.

The number of plants with different averages was counted and recorded.
The results of the investigation are shown in the table below.

WITHOUT ARTIFICIAL SELECTION	
Average number of hairs	Number of plants
0–5	50
6–10	35
11–15	24
16–20	20
21–25	25
26–30	12
31–35	8
36–40	6

WITH ARTIFICIAL SELECTION	
Average number of hairs	Number of plants
0–5	8
6–10	5
11–15	18
16–20	25
21–25	35
26–30	45
31–35	30
36–40	14

[Adapted from: *www.media.collegeboard.com*]

3.2.1 Identify the:

(a) Independent variable (1)

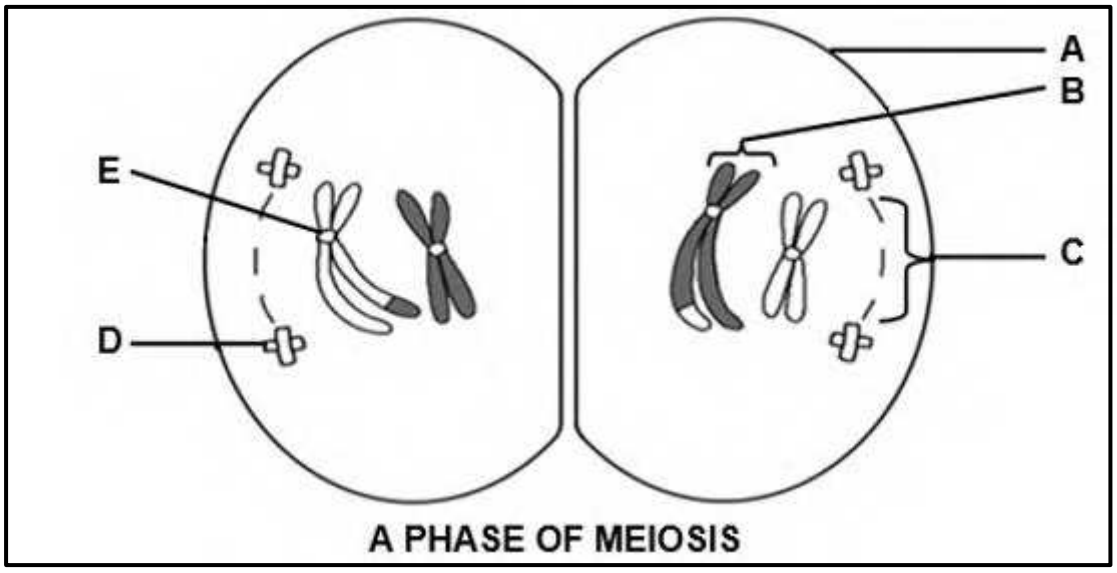
(b) Dependent variable (1)

3.2.2 State ONE way the students could have made their results more reliable. (1)

3.2.3 Give a conclusion for this investigation. (2)

3.2.4 Draw a histogram showing the results with artificial selection. (6)
(11)

3.3. The diagram below shows the somatic cells of an organism in one of the phases of meiosis.



A PHASE OF MEIOSIS

3.3.1 Which phase of meiosis is represented in the diagram? (1)

3.3.2 Give the LETTER and NAME of the part that:

(a) Carries the genetic information (2)

(b) Holds the chromatids together (2)

3.3.3 State the number of chromosomes present in each of the cells of this organism.

(a) At the beginning of meiosis (1)

(b) In a gamete of this organism (1)
(7)

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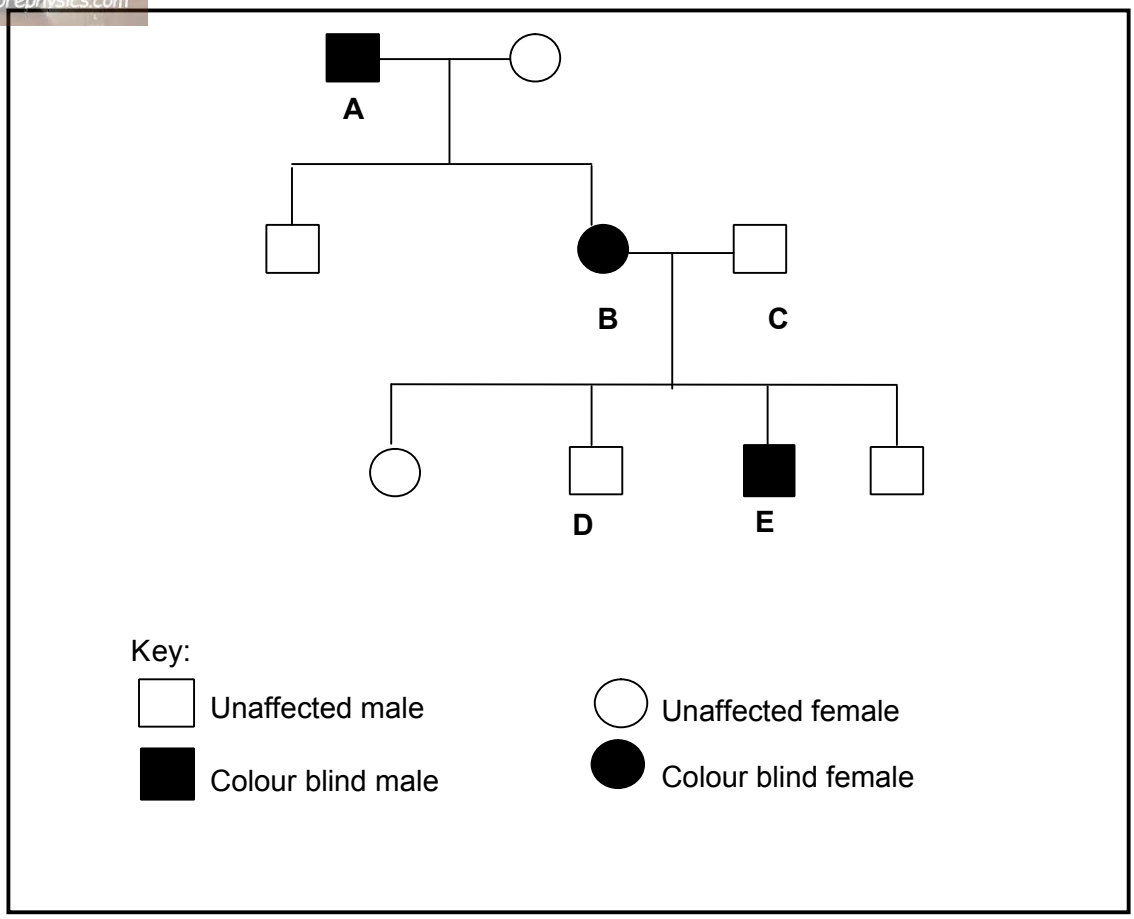
3.4 The pedigree diagram below shows the inheritance of colour blindness in a family. The normal allele is represented by $\mathbf{X^D}$ and the allele causing colour blindness is represented by $\mathbf{X^d}$.



3.4.1 Determine the:

(a) Phenotype of individual **D** (1)

(b) Genotype of individual **A** (1)

3.4.2 State ONE reason why colour blindness is regarded as a sex-linked disorder. (1)

3.4.3 Explain why females have a lesser chance of suffering from colour blindness than males. (4)

3.4.4 Represent a genetic cross to show the percentage chance of individuals **B** and **C** having another colour-blind son. (6)
(13)

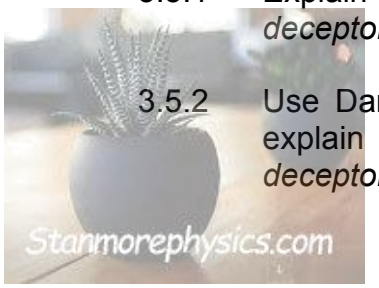
3.5 The photographs of two butterflies are provided below. Both butterflies live in the same habitat and are preyed on by predators. Although these butterflies are very similar in appearance, they are two separate biological species.
Amauris ochlea has an unpleasant taste, while *Hypolimnas deceptor* does not have an unpleasant taste.

Amauris ochlea

Hypolimnas deceptor

TWO SPECIES OF BUTTERFLY

3.5.1 Explain why most predators are less likely to feed on *Hypolimnas deceptor.* (2)



3.5.2 Use Darwin's theory of evolution through natural selection to explain the evolution of the appearance of the *Hypolimnas deceptor* butterfly. (6)
(8)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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PREPARATORY EXAMINATION

GRADE 12

LIFE SCIENCES P2

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks are reached and put a wavy line and 'max' in the right-hand margin.

2. **If, for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.

3. **If the whole process is given when only a part of it is required**
   Read all and credit the relevant part.

4. **If comparisons are asked for, but descriptions are given**
   Accept if the differences/similarities are clear.

5. **If tabulation is required, but paragraphs are given**
   Candidates will lose marks for not tabulating.

6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.

7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.

8. **If the sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation, but credit the rest of the answer, if correct.

10. **Wrong numbering**
    If the answer fits into the correct sequence of questions, but the wrong number is given, it is acceptable.

11. **If the language used changes the intended meaning**
    Do not accept.

12. **Spelling errors**
    If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.

13. **If common names are given in terminology**
    Accept, provided it was accepted at the national memo discussion meeting.

14. **If only the letter is asked for, but only the name is given (and vice versa)**
    Do not credit.

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15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately.

16. **Be sensitive to the sense of an answer, which may be stated differently.**

17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.

18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learner's assessment language used to the greatest extent in his/her answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This applies to all official languages.

19. **Changes to the memorandum**
No changes must be made to the memoranda. The Provincial Internal Moderator must be consulted.

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SECTION A

QUESTION 1

1.1	1.1.1	B ✓✓		
	1.1.2	C ✓✓		
	1.1.3	C ✓✓		
	1.1.4	A ✓✓		
	1.1.5	D ✓✓		
	1.1.6	A ✓✓		
	1.1.7	A ✓✓		
	1.1.8	D ✓✓		
	1.1.9	C ✓✓		
	1.1.10	C ✓✓	(10 x 2)	**(20)**
1.2	1.2.1	Gene ✓		
	1.2.2	Gametogenesis ✓		
	1.2.3	Phylogenetic ✓ tree		
	1.2.4	Dominant ✓		
	1.2.5	Biogeography ✓		
	1.2.6	Species ✓		
	1.2.7	Opposable thumb✓		
	1.2.8	Theory ✓		
	1.2.9	Non-disjunction ✓		
	1.2.10	Incomplete ✓ dominance	(10 x 1)	**(10)**
1.3	1.3.1	Both A and B ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	Both A and B ✓✓	(3 x 2)	**(6)**
1.4	1.4.1	Dihybrid cross ✓		(1)
	1.4.2	(a) bbnn ✓✓		(2)
		(b) Bitter ✓		(1)
		(c) BN Bn bN bn ✓✓		(2)
	1.4.3	bbNn is sweet with yellow spots ✓ Bbnn is bitter with no yellow spots ✓		(2) **(8)**
1.5.	1.5.1	(a) mRNA ✓		(1)
		(b) Peptide bond ✓		(1)
		(c) GAG ✓✓		(2)
	1.5.2	Ribosome ✓		(1)
	1.5.3	Uracil ✓		(1) **(6)**

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 2.1.1 GTA ✓✓ (2)

2.1.2 Cysteine ✓ and Threonine ✓ (2)

2.1.3 **The process is translation** ✓*
The codon **UAU** ✓of mRNA
was exposed on the ribosome ✓
The tRNA with the complementary anticodon **AUA** ✓
brought the amino acid **tyrosine** ✓
from the cytoplasm to the ribosome ✓
It was then bonded to the neighbouring/previous amino acid by a peptide bond ✓
(✓* compulsory mark + any 4) (5)
(9)

Credit compulsory mark and any 4 points in sequence
NB. No credit for generic description of translation process if it does not relate to amino acid 11 in the table.

2.2 Structural difference between DNA and RNA

DNA	RNA
Deoxyribose sugar ✓	Ribose sugar ✓
Nitrogenous base Thymine ✓	Nitrogenous base Uracil ✓
Double stranded ✓	Single stranded ✓
Helix structure✓	Straight molecule✓

1 mark ✓ for table and any 2 x 2 **(5)**
Mark first TWO only

2.3 2.3.1 A diploid body cell ✓✓ (2)

2.3.2 It is a haploid cell ✓/Does not have the desired characteristic (1)

2.3.3
- The diploid ✓ embryonic cell removed from an embryo of sheep V
- multiplied by mitosis ✓
- Producing identical cells ✓
- The identical nuclei of the cells were removed and implanted into empty ova ✓
- which developed into genetically identical embryos ✓ /lambs

Any 4 (4)

2.3.4 The nucleus/genetic material originated from sheep V ✓/ the genetic material of sheep W was removed from the ova (1)

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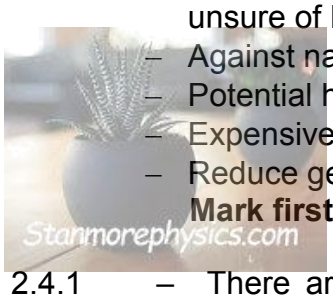
2.3.5
- Produce superior livestock ✓
- Produce livestock more rapidly ✓
- As market changes, livestock can be bred to respond to market changes and demands ✓

Mark first TWO only Any 2 (2)

2.3.6
- Against ethical/moral believes ✓
- It is not safe don't know what can happen to clone ✓/ unsure of long- term effects
- Against nature ✓
- Potential health impact✓
- Expensive ✓ (1)
- Reduce genetic variation ✓ **(11)**

Mark first TWO only Any 1



2.4 2.4.1
- There are 3 different alleles ✓ that determines blood groups
- An individual only inherit two alleles. ✓ (2)

2.4.2 I^Ai ✓✓ (2)

2.4.3
- The baby's genotype is ii ✓/homozygous for the recessive allele
- The baby must inherit one allele for type O blood/i from each parent ✓
- The father/Mr Wilson's genotype is AB and does not have the recessive/ i allele ✓ (3)

2.4.4
- Compare the DNA profiles of the daughter, mother and father ✓
- Identify the DNA bands of the daughter that are the same as that of the mother ✓
- All ✓ the remaining bands of the daughter must be the same as that of Mr Wilson ✓/the father (4)

(11)

2.5
- Males have one X – chromosome and one Y - chromosome on the gonosome✓/ 23 chromosome pair
- Females have two X- chromoomes on the gonosomes ✓ / 23 chromosome pair
- All ova have an X- chromosome from the gonosome ✓
- If an ovum is fertilized by an X-chromosome bearing sperm a female/girl is formed ✓ **(4)**
- If an ovum is fertilized by a Y-chromosome bearing sperm a male/boy is formed ✓ Any 4

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2.6 2.6.1
- The population of a single species of squirrels becomes separated by a geographical barrier, (**the river)** ✓*
- The population split into two populations. ✓
- There was no gene flow between the two populations ✓
- Since each population was exposed to different environmental conditions ✓/the selections pressure was different
- natural selection occured independently ✓ in each of the two populations
- such that the individuals of the two populations became very different ✓ from each other
- genotypically and phenotypically ✓
- Even if the populations are to mix again ✓
- they will not be able to interbreed ✓
- The two populations are now different species

1 Compulsory mark + Any 6 (7)

2.6.2
- Breeding at different times of the year ✓
- Species-specific courtship behaviour ✓
- Plant adaptations to different pollinators ✓
- Infertile offspring ✓
- Prevention of fertilisation ✓

Mark first THREE only Any 3 (3)

(10)

(50)

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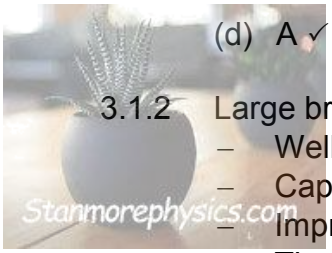
QUESTION 3

3.1 3.1.1 (a) A/B ✓ **(mark first one only)** (1)

(b) C ✓ (1)

(c) C ✓ (1)

(d) A ✓ (1)



3.1.2 Large brain give rise to:
- Well-developed hand-eye coordination ✓
- Capacity of language ✓
- Improved intelligence ✓
- The ability to receive and process more stimuli from the environment ✓
- Better decision making ✓

Mark first TWO only Any 2 (2)

3.1.3
- Smaller cranium size ✓
- Brow ridges are well developed ✓
- Cranial ridges present ✓
- Larger jaws ✓
- Sloping face ✓
- Less developed chin ✓

Mark FIRST THEE only Any 3 (3)

3.1.4 Fossil evidence ✓
Genetic evidence ✓ (2)
(11)

3.2 3.2.1 (a) With OR without artificial selection ✓ (1)

(b) Number of plants with more hairs on their leaves ✓ (1)

3.2.2 Repeat the investigation ✓
Increase the sample size ✓
Mark FIRST ONE only (1)

3.2.3 With artificial selection the number of plants with more hairs on their leaves increases ✓✓ (2)

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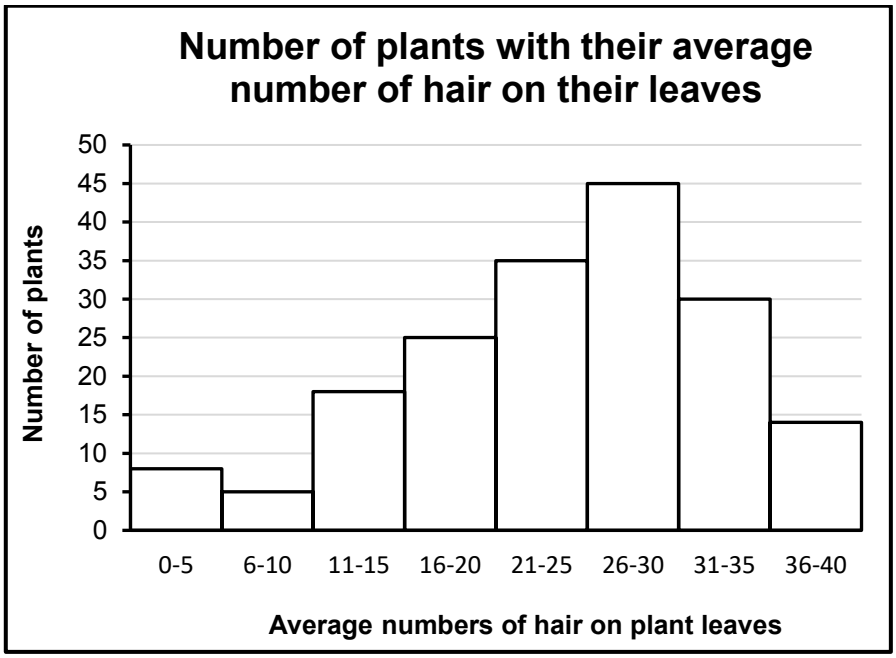
3.2.4



	Mark Allocation
Correct type of graph (T)	1
Caption for graph with both variables (C)	1
Correct label for X-axis and label for Y-axis (L)	1
Correct scale for X-axis, scale for Y-axis and width of bars (S)	1
Plotting of points (P)	1 (1 to 7points correct) 2 (All 8 points correct)
Note: If the wrong graph is drawn, marks will be lost for 'correct type of graph' and correct scale. If axes are transposed, marks will be lost for labelling of X-axis and Y-axis.	

(6)
(11)

3.3 3.3.1 Prophase II ✓ (1)

3.3.2 (a) B ✓ – chromosome ✓ (2)

(b) E ✓ – centromere ✓ (2)

3.3.3 (a) 4 ✓ (1)

(b) 2 ✓ (1)
(7)

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3.4 3.4.1 (a) Unaffected male ✓ (1)

(b) X^dY ✓ (1)

3.4.2 The recessive alleles are only carried on the X chromosome of the gonosome ✓/ 23 chromosome pair (1)

3.4.3

- Colour blindness is carried by a recessive allele ✓
- On the X-chromosome of the gonosome ✓
- Females have two X chromosomes on the gonosome ✓
- Females must inherit two copies of the recessive allele to show the disorder ✓/females who inherit only one of the recessive allele are still normal (4)

3.4.4 **P_1**

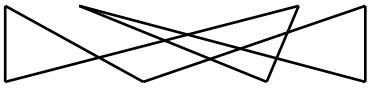
Phenotype : Colour blind female x Unaffected male ✓

Genotype : X^dX^d x X^DY ✓

Meiosis

G/gametes X^d, X^d X^D, Y ✓

Fertilization



F_1 Genotype X^DX^d X^dY X^DX^d X^dY ✓

Phenotype 1 normal daughter :1 colour blind son ✓

50% chance of having a colour blind son ✓*

P_1 and F_1 ✓

Meiosis and fertilization ✓

(✓***Compulsory** 1 + Any 5) (6)

OR

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P_1
Phenotype: Colour blind female x Unaffected male ✓
Genotype: X^dX^d x X^DY ✓

Meiosis

Fertilization

Gametes	X^d	X^d
X^D	$X^D X^d$	$X^D X^d$
Y	$X^d Y$	$X^d Y$

1 mark for correct gametes ✓
1 mark for correct genotypes✓

F_1 Genotype X^DX^d X^dY X^DX^d X^dY

Phenotype 1 normal daughter : 1colour blind son ✓

50% chance of having a colour blind son ✓*

P_1 and F_1 ✓
Meiosis and fertilization ✓ (6)
(✓***Compulsory** 1 + Any 5) **(13)**

3.5 3.5.1
- Predators may mistake it ✓/avoid eating them
- because they resemble A. ochlea which has an unpleasant taste✓ (2)

3.5.2
- There was a variation in the appearance and taste of butterflies √
- The ***Amauris ochlea*** did have an unpleasant taste and the ***Hypolimnas deceptor*** that looks like the ***Amauris ochlea*** did not have an unpleasant taste√
- Predators feed on butterflies in this habitat √
- ***Hypolimnas deceptor*** that look like the ***Amairis ochlea*** with the unpleasante taste were avoided by predetors√ / predators did not prey on them
- they were mistaken by their appearance for unpleasant taste√
- the ***Hypolimnas deceptor*** survive√
- They reproduced and √
- Passed the alle of apperence/allele of looking similar to ***A. ochle*** to the offsprings√
- More ***H deceptor*** butterflies is in the next generation that look like ***A ochlea***.√

Any 6 (6) **(8)** **[50]**

TOTAL SECTION B: 100
GRAND TOTAL: 150

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