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Western Cape Government

METRO NORTH EDUCATION DISTRICT

SCHOOL-BASED ASSESSMENT

SEPTEMBER TRIAL COMMON EXAMINATION

LIFE SCIENCES P2

TASK NO: 6

14 SEPTEMBER 2026



TOTAL: 150 marks
TIME : 2 hours 30 minutes

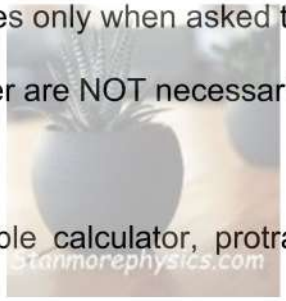
This question paper consists of 19 pages

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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 answers 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. ALL drawings must be done in pencil and labelled in blue or black ink.
7. Draw diagrams, flow charts or tables 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 correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 A group of similar organisms that can interbreed to produce fertile offspring and which live in a particular place at a particular time.

A Population
B Genus
C Species
D Family

1.1.2 The phase in meiosis where chromatids are pulled towards opposite poles is…

A Anaphase I
B Telophase I
C Metaphase II
D Anaphase II

1.1.3 A plant species has a diploid chromosome number of 14.

What would the chromosome number be of a gamete of this species?

A 28
B 14
C 7
D 42

1.1.4 In a dihybrid cross, an animal with long ears (**E**) and red fur (**R**) was crossed with an animal with short ears (**e**) and black fur (**r**).

Which ONE of the following could represent the genotypes of the parents?

A EERR x eerr
B EeRr x EeRr
C eeRR x eerr
D Eerr x EERr

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1.1.5 The following statements relate to cell division of a human somatic cell:

(i) Crossing over occurs
(ii) Contributes to genetic variation within a population
(iii) Produces four diploid daughter cells
(iv) Produces two somatic cells

Which ONE of the following combinations of statements refer to meiosis?

A (i), (ii) and (iii) only
B (i) and (ii) only
C (ii) and (iv) only
D (ii) and (iii) only

1.1.6 Scientists have suggested that the development of bipedalism was a factor contributing to toolmaking in hominids.

Which of the following was an advantage of bipedalism that allowed toolmaking in hominids?

A Improved teamwork and courtship behaviour
B Food could be seen from a distance
C Free use of hands to manipulate objects
D Ability to run fast from predators

1.1.7 Study the mechanisms below:

(i) Species-specific courtship behaviour
(ii) Infertile offspring
(iii) Adaptation to different pollinators
(iv) Breeding at different times of the year

Which ONE of the following combinations represents reproductive isolating mechanisms in animals ONLY?

A (i), (ii) and (iv) only
B (ii), (iii) and (iv) only
C (i), (ii) and (iii) only
D (i), (ii), (iii) and (iv)

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1.1.8 Antibiotic resistance in bacteria is an example of evolution in present times.

Which ONE of the following is a CORRECT explanation for this evolution?

A There is variation in the bacteria and the resistant bacteria survive.
B The bacteria acquire resistance to the antibiotic by being exposed to it.
C The greater the number of bacteria, the higher the resistance.
D The greater the number of bacteria, the lower the resistance.

1.1.9 For a particular characteristic, the offspring inherits …

A both alleles from the father.
B both alleles from the mother.
C one allele from the mother and one allele from the father.
D the alleles from either the mother or the father randomly.

1.1.10 Colour-blindness is a disorder caused by a recessive allele on the X chromosome. Which ONE of the following is the genotype of a colour-blind person?

A X^DX^D
B X^DY
C X^DX^d
D X^dY

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

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1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.9) in the ANSWER BOOK.

1.2.1 Splitting of the cytoplasm during telophase of meiosis

1.2.2 A representation of the number, shape and arrangement of all the chromosomes in the nucleus of a somatic cell

1.2.3 Family to which humans belong

1.2.4 A testable statement that may be accepted or rejected

1.2.5 The bond that connects amino acids in a protein molecule

1.2.6 The complete set of genes found in each nucleus of any individual of a particular species

1.2.7 The specific name for the X and Y sex chromosomes in humans

1.2.8 The position of a gene on a chromosome

1.2.9 The phase in the cell cycle when DNA replication occurs

(9 x 1) **(9)**

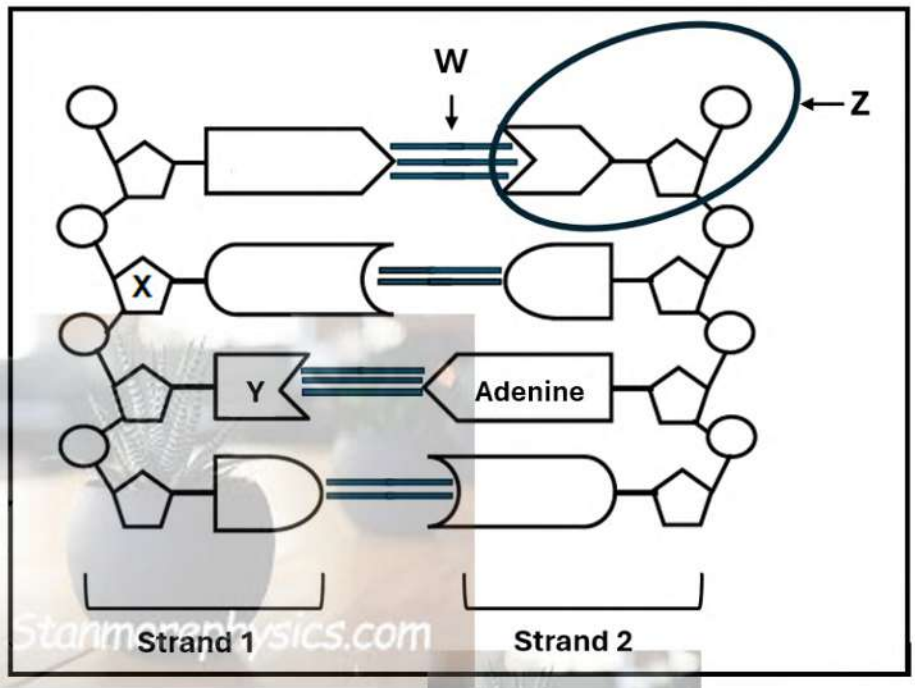
1.3 Indicate whether each of the descriptions in COLUMN I applies to **A ONLY**, **B ONLY**, **BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only**, **B only**, **both A and B** or **none** next to the question number (1.3.1 to 1.3.3) in the ANSWER BOOK.

	COLUMN I	COLUMN II
1.3.1	An example of continuous variation in humans	A Height B Blood type
1.3.2	Supports the Out of Africa Hypothesis	A Fossil evidence B Genetic evidence
1.3.3	Describes evolution as consisting of long phases of little change alternating with short phases of rapid change	A Lamarckism B Punctuated equilibrium

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

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1.4 The diagram below represents part of a DNA molecule.



1.4.1 Identify the:

(a) sugar at **X** (1)

(b) molecule **Y** (1)

(c) bond at **W** (1)

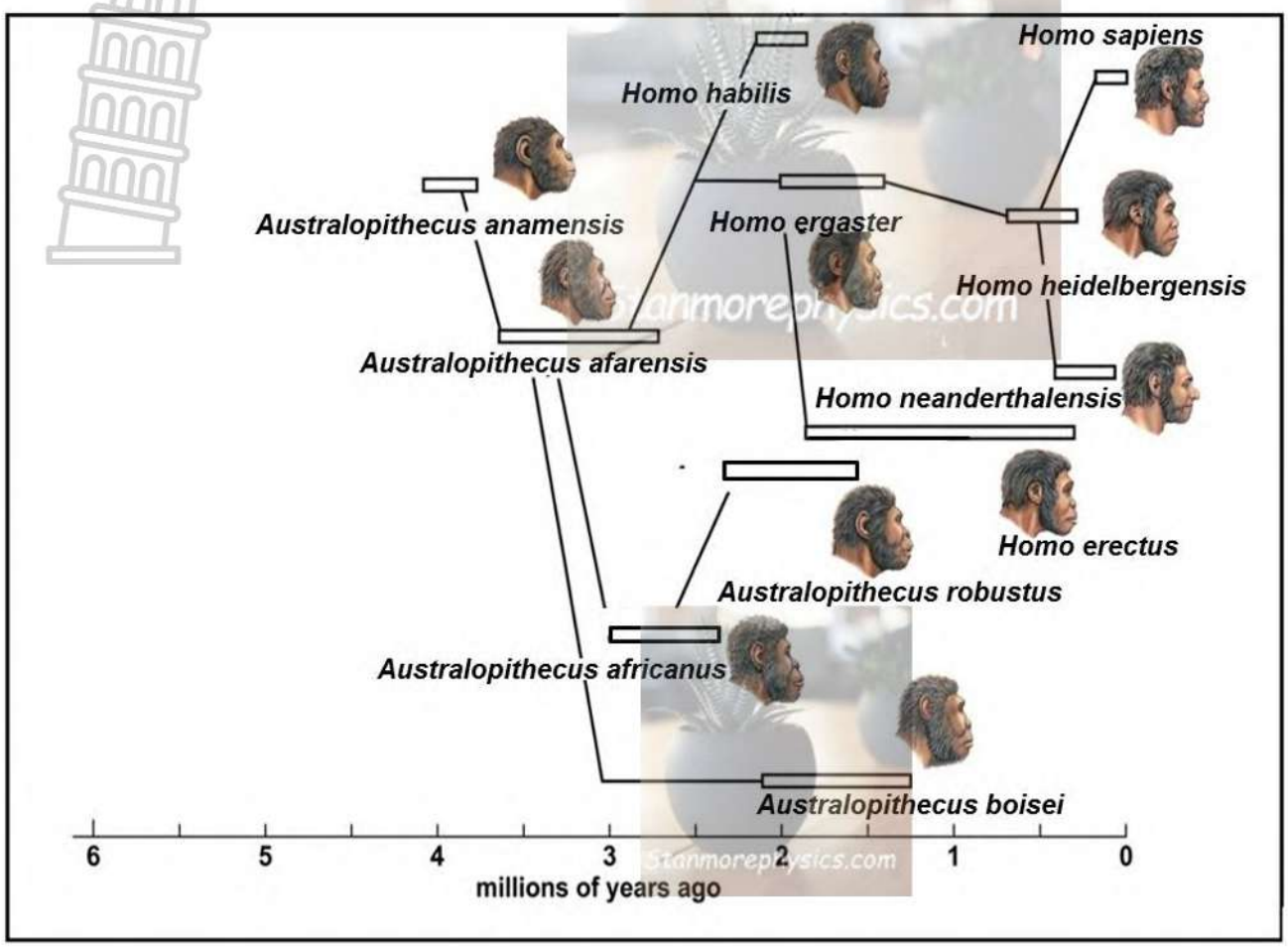
1.4.2 Give the collective name for part labelled **Z**. (1)

1.4.3 What is the natural shape of the DNA molecule? (1)

1.4.4 Name TWO places in an animal cell where DNA is located. (2)
(7)

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1.5 The diagram below shows possible evolutionary relationships among some hominids.



1.5.1 Name the type of diagram shown above. (1)

1.5.2 How many of EACH of the following are represented in the diagram:

(a) Genera (1)

(b) Homo species (1)

1.5.3 Name the common ancestor for the *Homo* species. (1)

1.5.4 Name TWO species that may have competed with *H.heidelbergensis* for resources. (2)

1.5.5 State how long *H. erectus* existed on Earth? (2)
(8)

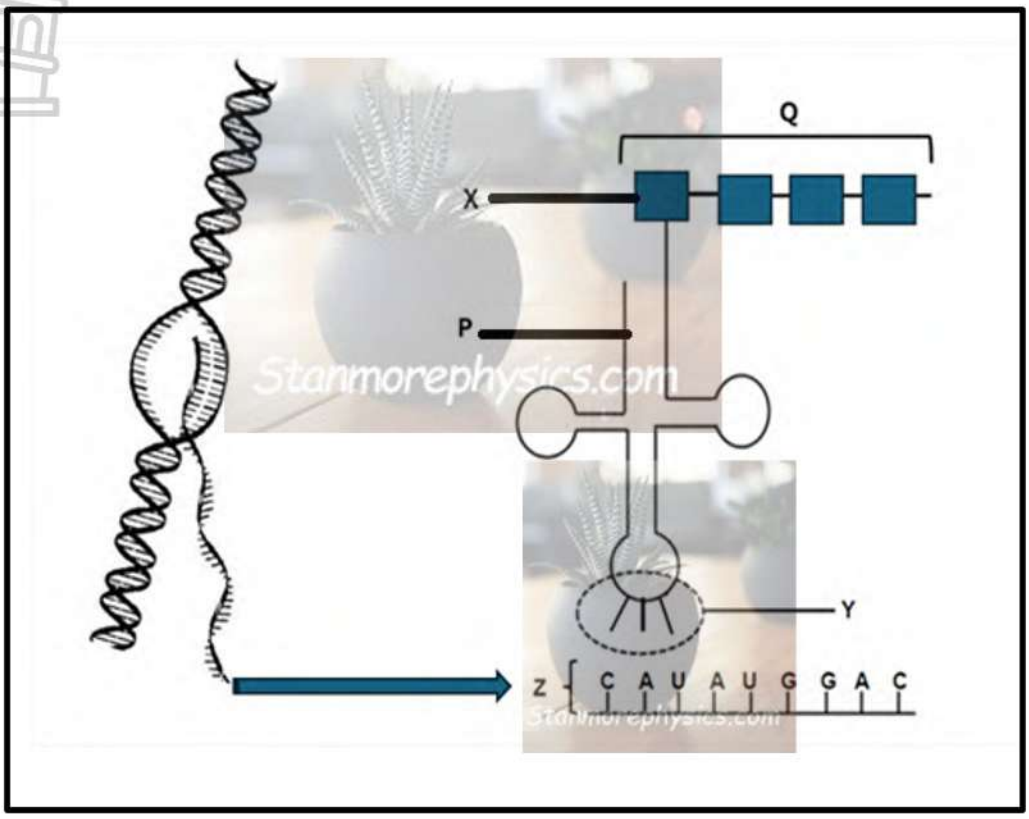
TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 The diagram below represents various processes that occur in cells during protein synthesis.



2.1.1 Identify molecule:

(a) **X** (1)

(b) **P** (1)

2.1.2 Give the nitrogenous base sequence of:

(a) the DNA base triplet complementary to the middle codon on molecule **Z** (2)

(b) **Y** (1)

2.1.3 Explain the functional significance of molecule **Z** in the process of the formation of molecule **Q**. (2)

2.1.4 Name and describe the process taking place outside the nucleus during the formation of a protein. (6)
(13)

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2.2 The table below shows the codons that code for some amino acids.

AMINO ACID	CODON
Glycine	GGA
Methionine	AUG
Serine	AGU ; AGC
Threonine	ACA ; ACU
Aspartate	GAU
Isoleucine	AUC ; AUA

2.2.1 Name the:

(a) amino acid carried by the tRNA with anticodon UAG (1)

(b) anticodon for glycine (1)

2.2.2 A mutation caused the DNA base triplet to change from TGT to TGA.

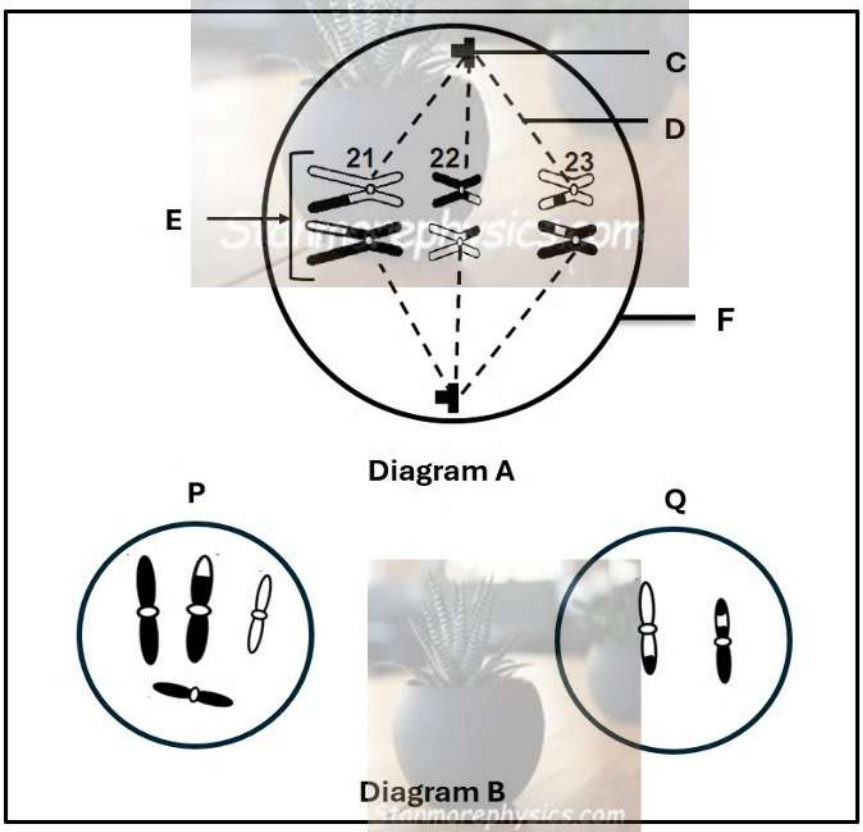
(a) Name the type of mutation that occurred. (1)

(b) Explain how this mutation will affect the protein formed (4)
(7)

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2.3 Diagram **A** represents a phase of meiosis in a human and diagram **B** below represents the distribution of chromosome pair 21 as it appears in one of the daughter cells of the same individual at the end of meiosis **II**.



2.3.1 Identify structure:

(a) **C** (1)

(b) **D** (1)

(c) **F** (1)

2.3.2 (a) Name the type of gamete that would form at the end of meiosis II illustrated in the diagrams above. (1)

(b) Give a reason for your answer in **QUESTION 2.3.2 (a)** (1)

2.3.3 Name TWO ways in which the chromosomes labelled **E**, are similar to each other. (2)

2.3.4 Identify the phase shown in DIAGRAM **A**. (1)

2.3.5 Explain the number of chromosomes present in gamete **Q**. (3)

2.3.6 If gamete **P** is involved in fertilisation, describe how this may result in Down syndrome in humans. (3)
(14)

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2.4 In Andalusian chickens, feather colour is determined by a single gene exhibiting incomplete dominance. The allele for black feathers is represented by **B** and the allele for white feathers is represented by **W**.

When a black-feathered rooster is crossed with a white-feathered hen, all offspring develop grey - feathers.

2.4.1 Define the term incomplete dominance. (2)

2.4.2 State the genotype of the black-feathered chicken (1)

2.4.3 A poultry farmer crosses two grey - feathered Andalusian chickens.

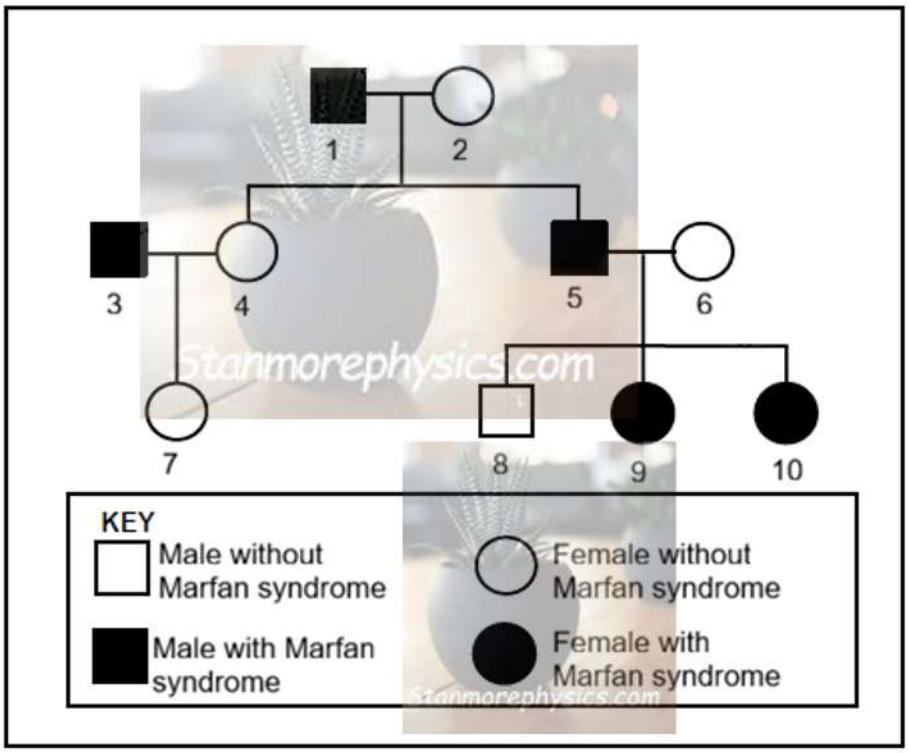
Use a genetic cross to demonstrate the expected phenotypic ratio of the offspring. (6)
(9)



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2.5 Marfan syndrome is an autosomal genetic disorder of the connective tissue. It is caused by a dominant allele (**M**). It results in individuals who have tall, thin build, long fingers/ limbs and cardiovascular defects.

The pedigree diagram below shows the inheritance of Marfan syndrome in a family.



2.5.1 How many offspring do parents **5** and **6** have? (1)

2.5.2 Identify the:

(a) Phenotype of individual **2** (1)

(b) male that does not suffer from Marfan syndrome. (1)

2.5.3 Individual **3** and **4** have one daughter marked **7.**

Explain why their daughter is without Marfan syndrome. (4)
(7)
[50]

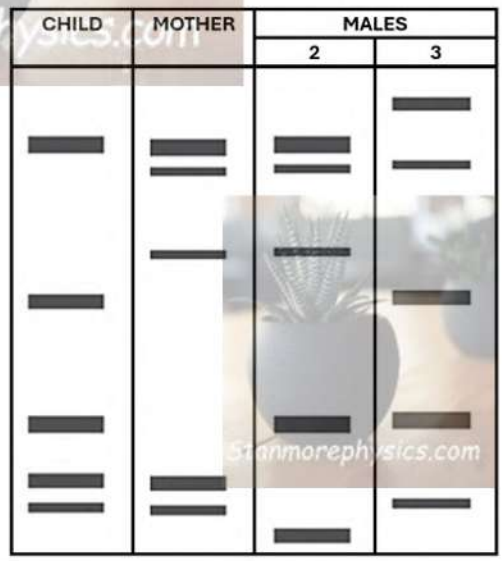
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QUESTION 3

3.1 A family wanted to determine the biological father of a child. Investigators first analysed the blood groups before they conducted DNA profiling. A paternity test was done for THREE males.

The results from the blood groups analysed and DNA profiling are shown below.

	MALE 1	MALE 2	MALE 3	MOTHER	CHILD
BLOOD GROUP	AB	A	B	O	O



3.1.1 Name the:

(a) number of alleles that controls blood groups (1)

(b) possible genotypes for male **3** (2)

3.1.2 Explain why male **1** was excluded in the DNA profiling. (4)

3.1.3 According to the DNA profiles, which male (**2** or **3**) is the father? (1)

3.1.4 Explain why blood groups on their own cannot be used to determine paternity testing. (2)

3.1.5 State ONE other use of DNA profiling. (1)
(11)

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3.2 The table below shows the percentage of the populations with different blood groups for two countries.

BLOOD GROUP	PERCENTAGE OF POPULATION	
	COUNTRY Q	COUNTRY R
O	40	20
A	10	35
B	45	40
AB	5	5

3.2.1 Which blood group shows the greatest percentage difference between the two countries? (1)

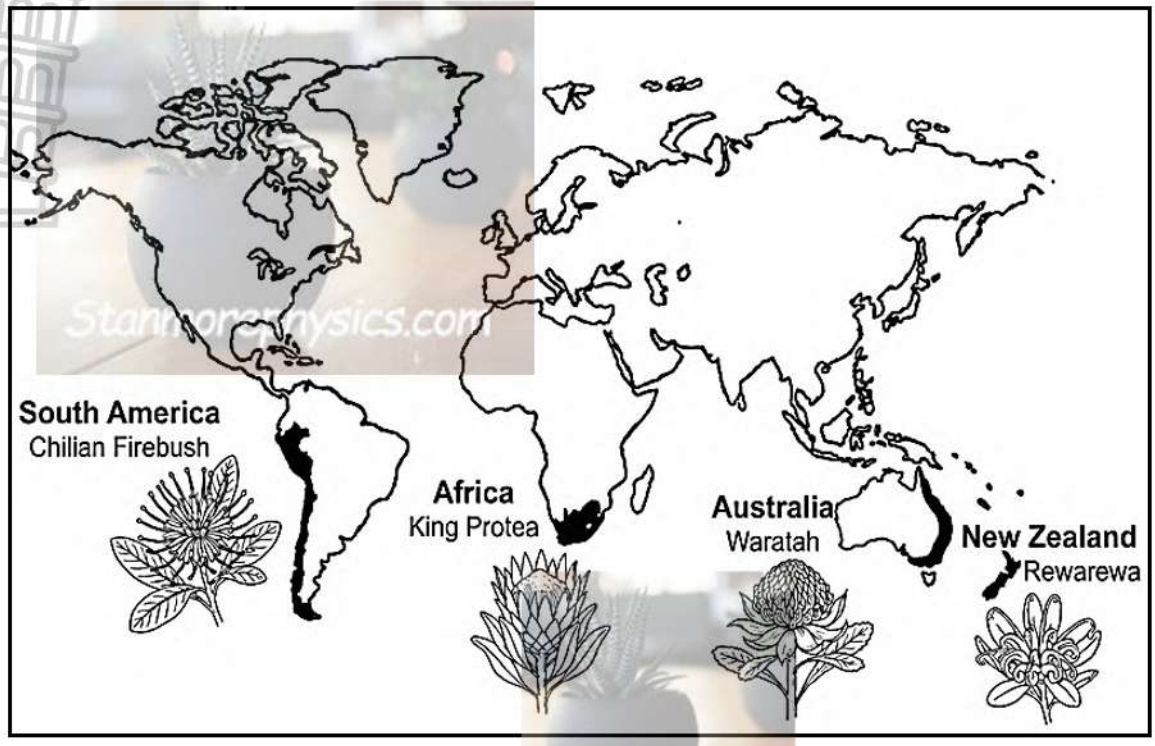
3.2.2 The population size of country **Q** is 10 million people.

Calculate the number of people who have blood group **O**. Show ALL your working. (3)

3.2.3 Draw a bar graph to illustrate the percentage distribution of blood groups in country **R**. (6)
(10)

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3.3 The present-day distribution of four closely related species of the *Proteaceae* species, the Chilian Firebush, King Protea, Waratah and Rewari is shown on the world map below.



3.3.1 What type of evidence for evolution is represented here? (1)

3.3.2 Describe how these four species could have evolved from a common ancestor. (7)
(8)

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3.4 In a certain community, the local people performed a ceremony each year to pray for rain. This involved catching a particular species of fish for the ceremony. To catch the fish, they first added a natural plant toxin to the water. This toxin made the fish unconscious and therefore caused them to float to the surface, making them easy to catch.

Scientists wanted to investigate the effect of the toxin used on the period of survival of the fish.

They conducted the investigation as follows:

- They collected a sample of 100 fish from the area where the toxin was added (Sample **A**).
- They collected a second sample of 100 fish from an area that was not contaminated with the toxin (Sample **B**).
- The samples were placed into two different tanks containing clean water.
- They recorded the period of survival of the fish in each tank.

Scientists found that the fish in sample **A** survived for a period of 50% longer than that of sample **B**.

3.4.1 Formulate an investigative question for this investigation. (2)

3.4.2 Identify the following in this investigation:

(a) Independent variable (1)

(b) Dependent variable (1)

3.4.3 State how the reliability of the results in this investigation could be improved. (1)

3.4.4 List TWO factors that should be kept constant in this investigation. (2)
(7)

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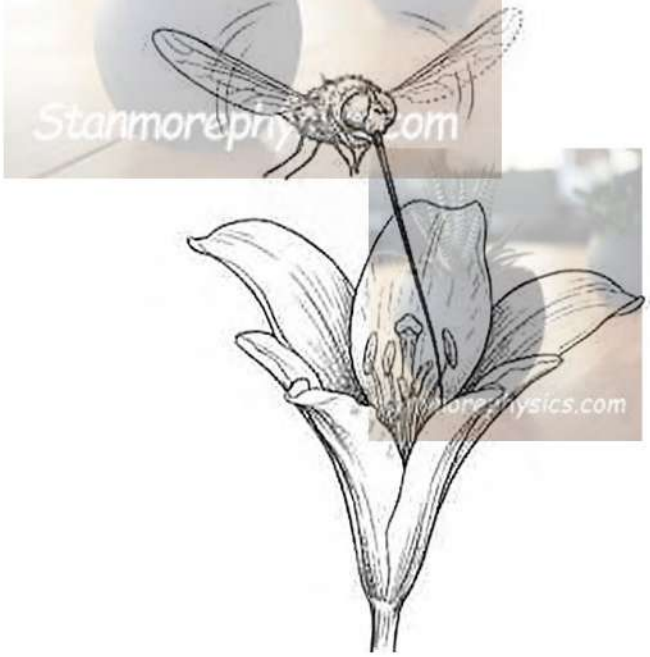
3.5 Read the extract below:

EVOLUTION OF THE SOUTH AFRICAN LONG-TONGUED FLY

The long-tongued fly (*Prosecco ganglbaueri*) relies entirely on nectar hidden deep within tube-like wildflowers in the Drakensberg region. Over several decades, biologists noted that these wildflowers gradually evolved longer floral tubes.

Following this shift, statistical data revealed that the average tongue length of the fly population increased significantly over subsequent generations. Flies with long tongues successfully reach the nectar.

The diagram below shows a long-tongued fly feeding.

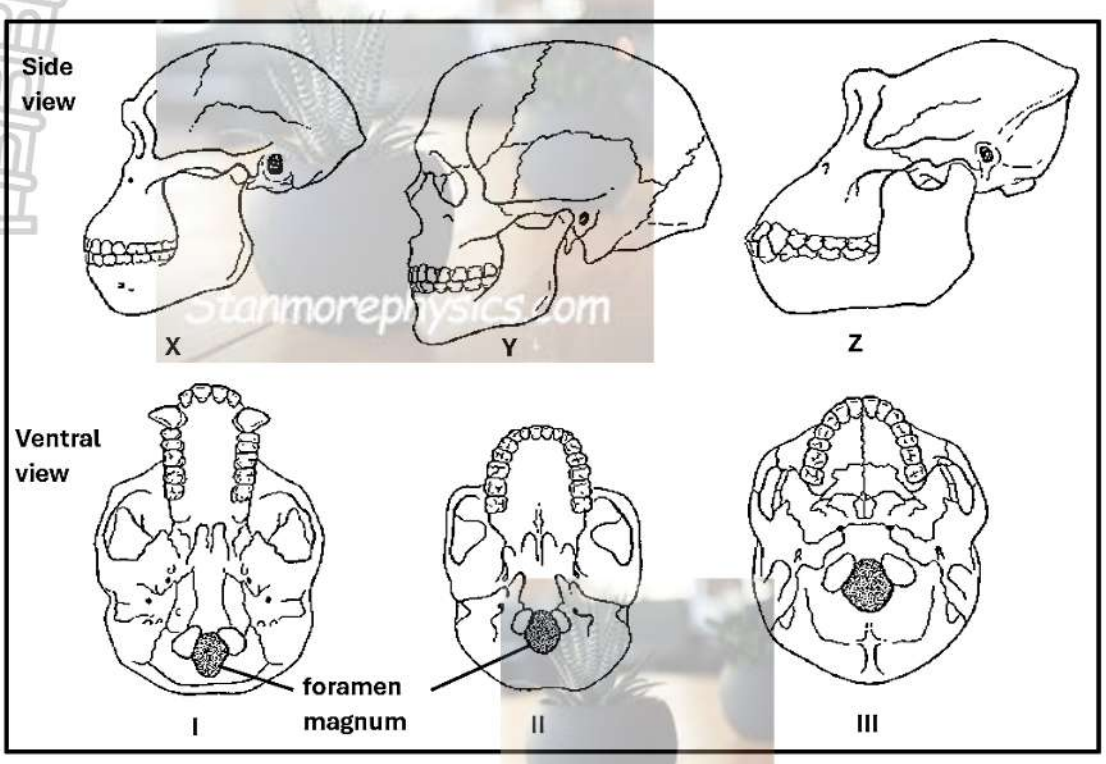


3.5.1 Explain how Lamarck would have described the evolution of the long tongues of the South African long-tongued fly. (4)

3.5.2 Give TWO reasons why Lamarck's theory was rejected. (2)
(6)

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3.6 The diagrams below represent the side views and ventral views of the skulls of three primates: a gorilla, *Australopithecus africanus* and *Homo sapiens*. The diagrams are not necessarily in the correct order.



3.6.1 Which of the skulls (**X**, **Y** or **Z**) belong to:

(a) An Australopithecine (1)

(b) A quadrupedal primate (1)

3.6.2 Explain the significance of the position of the foramen magnum in skull **I**. (2)

3.6.3 Which diagram (**I, II** or **III**) is the ventral view of skull **Y**? (1)

3.6.4 Give ONE reason for your answer to **QUESTION 3.6.3.** (1)

3.6.5 Explain the significance of the change in the cranium size of the humans that show progression in evolution. (2)
(8)
[50]

TOTAL SECTION B: 100
GRAND TOTAL: 150

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Western Cape Government

SCHOOL-BASED ASSESSMENT

SEPTEMBER COMMON TRIAL EXAMINATION

LIFE SCIENCES P2

TASK NO: 6

ADAPTED MARKING GUIDELINE [14/09/2026]

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TOTAL: 150 marks

This marking guideline consists of 13 pages

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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 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 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 answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.

11. **If 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 standardisation 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. Marking guidelines will allocate marks for units separately.

16. **Be sensitive to the sense of an answer, which may be stated in a different way.**

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 learners' 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 is applicable to all official languages.



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SECTION A

QUESTION 1

1.1	1.1.1	A✓✓		
	1.1.2	D✓✓		
	1.1.3	C✓✓		
	1.1.4	A✓✓		
	1.1.5	B✓✓		
	1.1.6	C✓✓		
	1.1.7	A✓✓		
	1.1.8	A✓✓		
	1.1.9	C✓✓		
	1.1.10	D✓✓	(10 x 2)	**(20)**
1.2	1.2.1	cytokinesis✓		
	1.2.2	karyotype ✓		
	1.2.3	Hominidae ✓ **(NOT HOMONID)**		
	1.2.4	hypothesis✓		
	1.2.5	peptide✓ bond		
	1.2.6	genome ✓		
	1.2.7	gonosomes✓		
	1.2.8	locus✓		
	1.2.9	Interphase✓	(9 x1)	**(9)**
1.3	1.3.1	A only✓✓		
	1.3.2	Both A and B✓✓		
	1.3.3	B only✓✓	(3 x 2)	**(6)**

1.4 1.4.1 (a) deoxyribose✓sugar (1)

(b) thymine✓/T (NOT thiamine) (NOT nitrogenous base) (1)

(c) hydrogen✓bond (1)

1.4.2 nucleotide✓ (1)

1.4.3 double helix✓ (1)

1.4.4
- nucleus✓
- mitochondrion✓ (2)

(Mark first TWO only) **(7)**

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1.5	1.5.1	Phylogenetic tree✓/ cladogram	(1)
	1.5.2	(a) 2✓	(1)
		(b) 6✓	(1)
	1.5.3	*Australopithecus afarensis*✓/ *A. afarensis*	(1)
	1.5.4	– *H.neanderthalensis*✓/ *Homo neanderthalensis* – *H.erectus* ✓/ *Homo erectus* **(Mark first TWO only)**	(2)
	1.5.5	1.5-1.7✓ million years✓/ my (NOT MYA)	(2) **(8)**

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 2.1.1 (a) Amino acid✓ (1)
(b) tRNA✓ (1)

2.1.2 (a) TAC✓✓ (2)
(b) GUA✓ (1)

2.1.3
- It carries the code ✓
- for the sequence of amino acids✓
- to form a specific protein✓ **(Any 2)** (2)

2.1.4 **Translation***✓ (compulsory mark)
- Each tRNA carries a specific amino acid ✓
- When the anticodon on the tRNA✓
- matches the codon on the mRNA✓
- then tRNA brings the required amino acid to the ribosome. ✓
- Amino acids become attached to each other by peptide bonds✓
- to form the required protein. ✓

Compulsory*(1) + (Any 5) (6)
(13)

2.2 2.2.1 (a) isoleucine✓ (1)

(b) CCU✓ (1)

2.2.2 (a) Gene✓ mutation (1)

(b)
- When T/ TGT changes to A/ TGA on DNA base triplet✓
- (Codon) ACA changes to ACU✓
- Both codons code for threonine✓
- No change in the sequence of amino acid✓/ the type of protein/protein stays the same (4)

(7)

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2.3 2.3.1 (a) Centriole✓/centrosome (1)

(b) spindle fibres✓ (1)

(c) Cell membrane✓ (plasma membrane) (1)

2.3.2 (a) Ovum✓ (egg cell NOT egg only) (1)

(b) chromosome pair 23 are the same size✓/both chromosomes XX (1)

2.3.3 Both:
- are similar lengths✓/size
- are similar in structure✓
- have genes for the same characteristic✓ (NOT the same genes)
- have alleles at the same loci✓
- have the same centromere position✓ (**Any 2**) (2)

(Mark first TWO only)

(1)

2.3.4 Metaphase I✓

2.3.5
- Gamete Q only has two chromosomes instead of three✓
- Chromatids of chromosome 21 failed to separate✓/non-disjunction of chromosome 21
- During **anaphase II**✓
- Resulting in gamete Q having one chromosome less✓ /gamete P an extra chromosome (**Any 3**) (3)

2.3.6
- If gamete P with an extra chromosome at position 21✓/24 chromosomes
- gets fertilised by a normal gamete✓/gamete with 23 chromosomes
- the zygote will have 47 chromosomes ✓/trisomy **(Any 3)** (3)

(14)

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2.4 2.4.1
- An inheritance pattern in which neither one of the two allele of a gene is dominant over the other✓/Neither allele is fully expressed
- resulting in an intermediate (or blended) phenotype✓ in the heterozygous condition (2)

2.4.2 BB✓ (1)

2.4.3

P_1	phenotype	grey-feathered chicken	x	grey-feathered chicken ✓
	genotype	BW	x	BW ✓
Meiosis ✓				
G/gametes		B, W	x	B, W✓
Fertilisation ✓				
F_1	genotype	BB, BW, BW, WW ✓		
	phenotype	Black-feathered chicken Grey-feathered chicken White-feathered ✓		
	Phenotypic ratio	**1:2:1✓***		

P_1 and F_1 ✓
Meiosis and fertilisation ✓

***1 compulsory mark** + Any 5

OR

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P_1 phenotype grey-feathered (chicken) x grey-feathered (chicken)✓

genotype BW x BW ✓

✓ ✓ *Meiosis*

Fertilisation

gametes	B	W
B	BB	BW
W	BW	WW

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

F_1 phenotype Black-feathered chicken
Grey-feathered chicken
White-feathered

Phenotypic ratio **1:2:1✓***

P_1 and F_1 ✓ (6)
Meiosis and fertilisation ✓ **(9)**

***1 compulsory mark** + Any 5

2.5 2.5.1 Three✓/ 3 (1)

2.5.2 (a) (Female) without Marfan syndrome✓ (1)

(b) 8✓ (1)

2.5.3
- Individual 3 has Marfan syndrome✓/ is affected
- is Heterozygous✓/ genotype Mm
- Individual 4 is without Marfan syndrome✓/ is unaffected
- Is homozygous recessive✓/ genotype mm
- One recessive allele was received from each parent✓
- Individual 7 has two recessive alleles✓/ genotype mm **Any** (4)

(7)
[50]

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QUESTION 3

3.1 3.1.1 (a) three✓/3 (1)

(b) I^Bi ✓; I^BI^B✓ (2)

3.1.2
- Male 1 has genotype I^AI^B✓
- Child has genotype ii ✓
- Not possible for male 1 to pass a recessive allele (i) to the child ✓
- Since a child inherits an allele from each parent from each parent ✓ (4)

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3.1.3 Male 3✓ (1)

3.1.4
- Since more than one person belong to the same blood group✓
- it can only be used to eliminate a possible father✓/not conclusive (2)

3.1.5
- Identification of criminals✓/forensic/solving crimes
- To identify missing persons✓
- To identify genetic disorders✓
- To determine family relations✓
- To match compatibility of tissues for organ transplants✓
- Identify dead persons/animals (**Any 1**) (1)

(Mark first ONE only) **(11)**

3.2 3.2.1 (Blood group) A✓ (1)

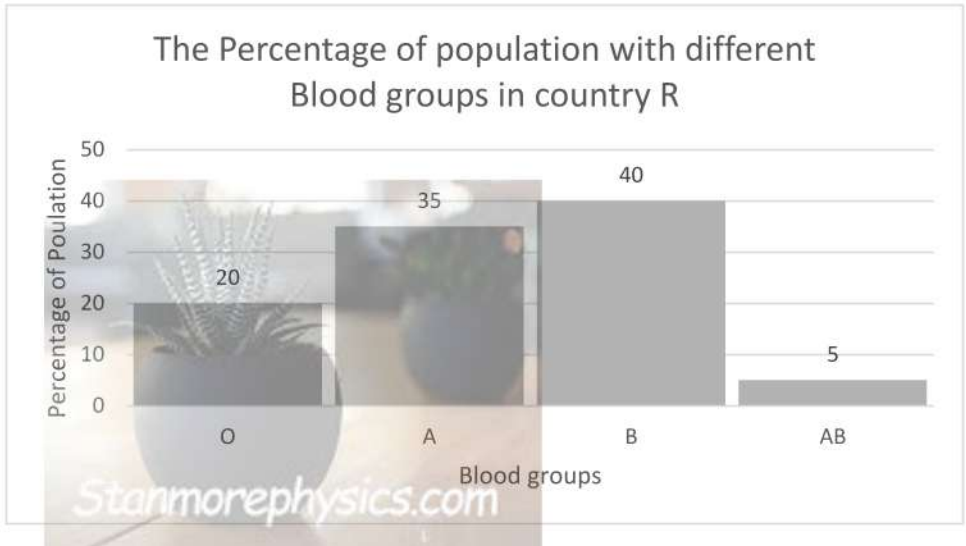
3.2.2 $\frac{40}{100}$ ✓ OR 0,4 OR 40% × 10 000 000 ✓ = 4 000 000 ✓

OR

$\frac{40}{100}$ ✓ OR 0,4 OR 40% × 10 $mill$ ✓ = 4 $mill$ ✓ (3)

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3.2.3



Criteria for marking the graph:

Criteria	Mark Allocation
Type of graph: Bar graph is drawn **(T)**	1
Caption of the graph includes both variables **(C)**	1
Correct labels for X-axis and Y-axis **(L)**	1
Equal space and width of bars for X-axis and correct scale for Y-axis **(S)**	1
Plotting: **(P)** 1 - 3 co-ordinates are plotted correctly All 4 co-ordinates are plotted correctly	 1 2

NOTE

If a histogram or line graph is drawn, marks will be lost for:

- Type of graph
- Scale

If axes are transposed:

- Can get all marks if labels are also swopped and bars are horizontal
- If labels are not corresponding then:
  - Marks will be lost for labels and scale
  - Plotting can get credit if coordinates are correct for given labels

(6)
(10)

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3.3 3.3.1 Biogeography✓ (1)

3.3.2
- The common ancestor population became separated✓
- by a (geographical barrier), the **ocean✓***
- then the population divides into four✓
- There was no gene flow between the groups ✓
- Each group experienced different environmental conditions✓
- and underwent natural selection independently✓
- The individuals in each group became different✓
- genotypically and phenotypically✓
- Eventually if the groups are mixed again, they cannot interbreed✓
- resulting in **four different species✓*** ***2 Compulsory** + Any 5 (7)

(8)

3.4 3.4.1 Does the toxin used in water affect the period of survival of the fish?✓✓ (2)

3.4.2 (a) The toxin✓ (1)

(b) Period of survival✓of the fish (1)

3.4.3
- Increase the sample size to more than 100✓
- Repeat with a different sample✓ **(Any 1)** (1)

3.4.4 (The same)
- Concentration of the toxin✓
- Volume of toxin✓
- Size of tanks✓
- Time of sample collection✓
- Amount of clean water✓
- Sample size✓
- Age of fish✓
- Mass of fish✓
- Species of fish✓
- Size of fish✓ (2)
- Type food✓ **(Any 2)** **(7)**

(Mark first TWO only)

3.5 3.5.1
- The long-tongued flies initially had short tonguess✓.
- As their food was found inside the tubes of the flowers✓,
- the long-tongued flies used their tongues to reach the nectar✓ .
- Their tongues grew longer as they used✓ it.
- The acquired trait, of a longer tongues, was passed on to their offspring✓. **(Any 4)** (4)

3.5.2
- Acquired characteristics are not inherited✓
- Only characteristics that are controlled by the genes✓ are inherited
- Too deterministic✓/ Organisms do not change because they want to change. (2)

(Any 2) **(6)**

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3.6	3.6.1	(a) X✓		(1)
		(b) Z✓		(1)
	3.6.2	- Foramen magnum is located in a more backward position✓ - Allows for the spine to extend horizontally✓/ from back of skull - Supporting quadrupedal movement✓	**(Any 2)**	(2)
	3.6.3	III✓/3		(1)
	3.6.4	- small teeth✓ / small canines - c-shaped palate✓/more rounded palate - foramen magnum in a more forward position✓ - no diastema✓ **(Mark first ONE only)**	**(Any 1)**	(1)
	3.6.5	- A larger cranium✓ - accommodates a bigger brain✓ - which suggest greater intelligence✓	**Any 2**	(2) **(8)** **[50]**

TOTAL SECTION B: 100
GRAND TOTAL: 150

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