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education
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

INSIKAZI CIRCUIT

GRADE 12

LIFE SCIENCES PRE TRIAL

PAPER TWO

02 SEPTEMBER 2020

MARKS: 150

TIME: 2h30 minutes

This question paper consists 15 of 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. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams 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 provided 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 1.1.4 D.

1.1.1 A molecule of RNA is copied from DNA by the process of …

A transcription.
B mitosis.
C mutation.
D translation.

1.1.2 If a recessive allele on the X-chromosome is passed on to the offspring it is an example of …

A sex-linked inheritance.
B incomplete dominance.
C multiple alleles.
D co-dominance.

1.1.3 What is the percentage chance of a woman having a female child?

A 25%
B 100%
C 50%
D 75%

1.1.4 A pedigree diagram shows …

A how organisms evolve.
B the inheritance of characteristics over many generations.
C sex-linked characteristics only.
D the number of children in a family only.

1.1.5 A red flowering plant is crossed with a white flowering plant. All the offspring have pink flowers. When the two pink flowering plants are crossed, the next generation of flowering plants will have flowers that are …

A pink only.
B red only.
C white only.
D pink, red and white.

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1.1.6 The difference between nucleic acids and nucleotides is that ...

A nucleic acids are building blocks of nucleotides.
B nucleotides are building blocks of nucleic acids.
C nucleotides are larger than nucleic acids.
D nucleic acids are found in the nucleus and nucleotides are found in the cytoplasm.

1.1.7 Which ONE of the following events occurs during metaphase I of meiosis?

A Homologous chromosomes arrange themselves at the equator
B Centrioles move to opposite poles
C Chromosomes arrange themselves singly at the equator
D Splitting of the cytoplasm

1.1.8 Brown eye colour in humans is dominant over blue eye colour. A man with brown eyes marries a woman with blue eyes. They have a son with brown eyes and a daughter with blue eyes.

We can conclude that …

A the man is not the true father of the children.
B the man is heterozygous for eye colour.
C eye colour is sex-linked.
D both parents are homozygous for eye colour.

QUESTIONS 1.1.8 AND 1.1.9 ARE BASED ON THE INFORMATION BELOW.

In a certain species of rabbits, body colour is controlled by two alleles where black **(B)** is dominant to white **(b).** Ear shape is controlled by a second gene. The allele for wide ears **(E)** is dominant to the allele for narrow ears **(e).**

1.1.9 What is the possible genotype for a black rabbit with narrow ears?

A BbEe
B bbee
C BBEe
D Bbee

1.1.10 What is the possible genotype of gametes produced by a white rabbit with narrow ears?

A bbee
B be
C BE, Be, bE and be
D bE and be

(10×2) (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 1.2.8) in the ANSWER BOOK.

1.2.1 The type of RNA containing anticodons

1.2.2 The process during which genetically identical organisms are formed using biotechnology

1.2.3 Undifferentiated animal cells that can form any type of tissue

1.2.4 Type of inheritance where none of the two alleles is dominant over the other and an intermediate phenotype is produced

1.2.5 The point of crossing over between two adjacent chromosomes

1.2.6 The organelle in a cell where translation occurs

1.2.7 Two or more alternative forms of a gene at the same locus

1.2.8 Chromosomes involved in sex determination

(8)

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 number (1.3.1 to 1.3.3) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 Contains the sugar ribose	A DNA B RNA
1.3.2 Chromosomes align at the equator	A Metaphase I B Metaphase II
1.3.3 Produced the first X-ray image of the DNA molecule	A Rosalind Franklin B Watson and Crick
1.3.4 Occurs during telophase of meiosis I	A Dividing of the cytoplasm B Centrioles move to the opposite poles

(4×2) **(8)**

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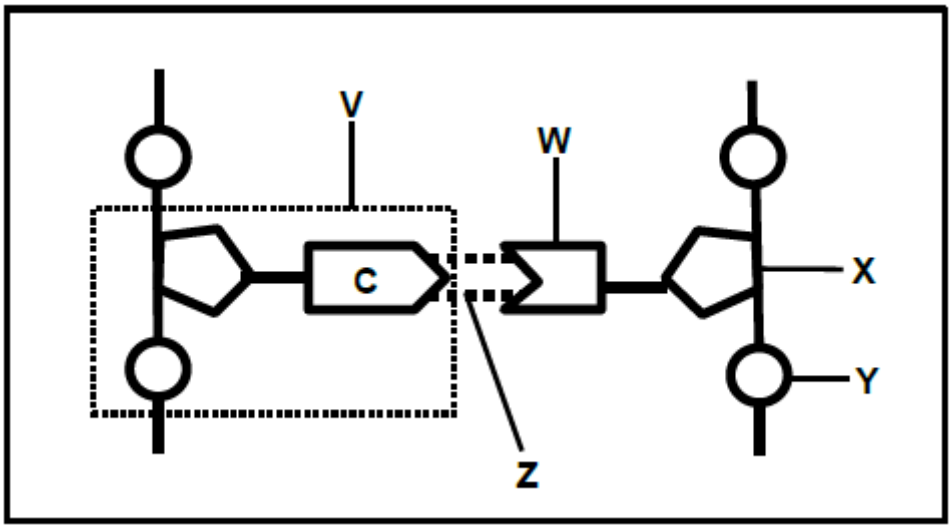
1.4 The diagram represents a portion of a nucleic acid.



1.4.1 Name the nucleic acid. (1)

1.4.2 Name TWO places in animal cells where this nucleic acid may be found (2)

1.4.3 Identify:

(a) Portion V (1)

(b)Nitrogenous base W (1)

(c) Molecule Y (1)

(d) Bond Z (1)

1.4.4 What is the natural shape of this molecule? (1)

1.4.5 Name the process during which this molecule makes a copy of itself. (1)

(9)

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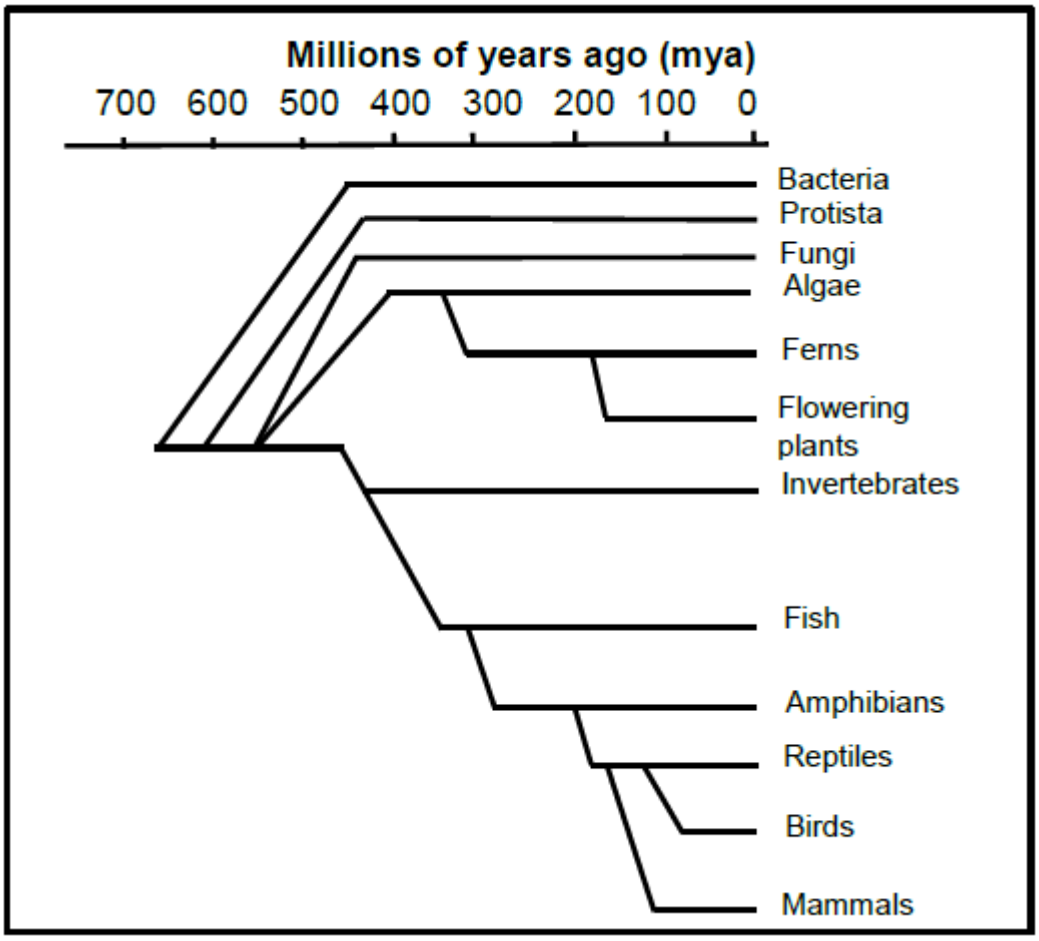
1.5 Study the diagram below.



According to the diagram:

1.5.1 How many million years ago did fungi appear on Earth? (1)

1.5.2 Which were the first organisms to appear on Earth? (1)

1.5.3 Which group is the most recent ancestor to flowering plants? (1)

1.5.4 Which group appeared on Earth most recently? (1)

1.5.5 Which group of organisms is most closely related to the birds? (1)

(5)

TOTAL SECTION A: 50

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SECTION B

QUESTION 2

2.1 A species of bacteria contains a type of protein, called protein 1. A mutation occurred which resulted in the formation of a second type of protein called protein 2, instead of protein 1.

Scientists determined the amino acid sequence of each protein. They then used the amino acid sequence to find the DNA base sequences that coded for portions of these proteins.

The results are shown in the tables below.

PORTION OF PROTEIN 1				
AMINO ACID SEQUENCE	Lysine	Serine	Proline	Cysteine
DNA BASE SEQUENCE	TTT	TCA	GGT	ACG

PORTION OF PROTEIN 1				
AMINO ACID SEQUENCE	Lysine	Serine	Proline	Tryptophan
DNA BASE SEQUENCE	TTT	TCA	GGT	ACC

2.1.1 Give the:

(a) DNA triplet for the third amino acid from the left in the sequence for protein 2 (1)

(b) Codon for lysine (1)

(c) Anticodon for serine (1)

2.1.2 Protein 1 is made up of 66 amino acids.
How many of EACH of the following is involved in the formation of this protein?

(a) Genes (1)

(b) RNA nucleotides (1)

(c) Codons (1)

2.1.3 State TWO differences between a DNA nucleotide and RNA nucleotide. (4)

2.1.4 Describe how the mutation caused a change in the structure of the protein. (4)

(14)

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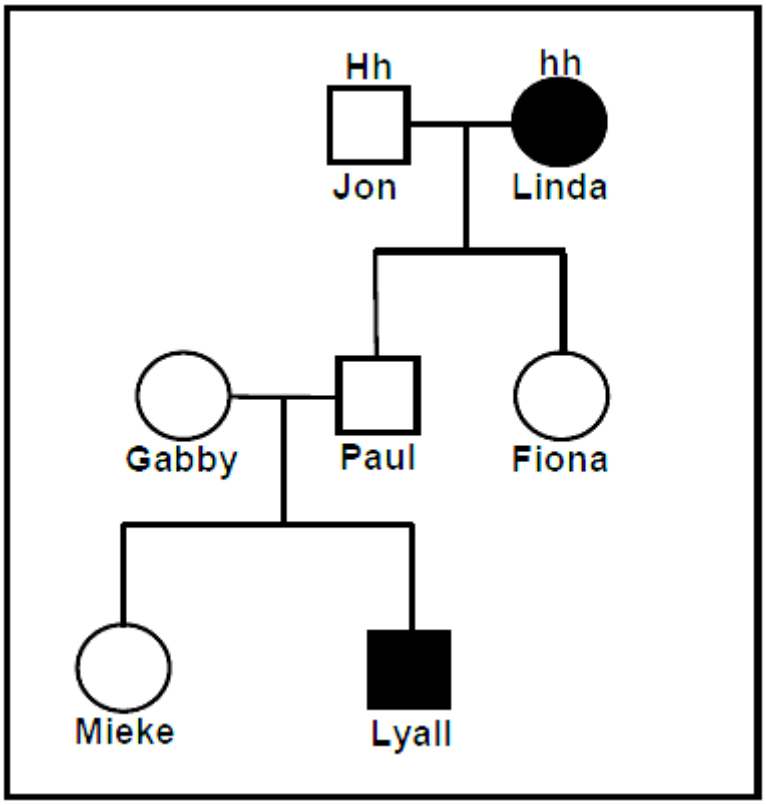
2.2 The diagram below shows the pattern of inheritance of deafness in a family. The letter H represents the allele for hearing and h represents the allele for deafness.



2.2.1 How many of EACH of the following are represented in this diagram?

(a) Males (1)

(b) Generations (1)

2.2.2 Give the:

(a) Phenotype of Jon (1)

(b) Genotype of Paul (1)

2.2.3 Both Lyall's parents can hear, yet he is deaf.
Explain how he inherited deafness. (2)

2.2.4 Lyall marries a woman who is homozygous dominant for hearing.
Use a genetic cross to show the percentage chance of them having a deaf child (7)

(13)

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2.3 In holly trees, red fruit (R) is dominant over white fruit (r) and spiny leaves (L) are dominant over smooth leaves (l).

The Punnett square below shows the possible results of a cross between two individual plants. The genotype at X is not given.

GAMETES	**RL**	**Rl**	**rL**	**rl**
RL	X	RRLl	RrLL	RrLl
Rl	RRLl	RRll	RrLl	Rrll
rL	RrLL	RrLl	rrLL	rrLl
rl	RrLl	Rrll	rrLl	rrll

2.3.1 Give the:

(a) Genotype of X (1)

(b) Phenotype of the parents (2)

2.3.2 In a population of 128 plants, how many plants with red fruit and smooth leaves are expected from the Punnett square above? Show ALL working. (3)

2.3.3 A farmer wanted to produce plants with only white fruit and spiny leaves.

Give the genotype of the plants that he should use in the cross. (2)

(8)

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2.4 Read the extract below.

Genetic engineering involves a process whereby a gene is isolated from one organism and transferred into another organism. This gene can become part of the new host's genome. Usually the gene transfer takes place between organisms from different kingdoms.

For example, a gene from a certain bacterium codes for an enzyme that deactivates a herbicide (a weedkiller). This gene is isolated from the bacterium and inserted into the chromosome of a crop plant. The resulting plant will now be herbicide-resistant.

Before the products of genetic engineering can be sold, many tests must be done.

Some seed companies have exclusive rights to sell the seeds that they have genetically engineered. Farmers cannot use seeds harvested from the crops that they have grown. Farmers must buy the seeds from the seed companies every time they want to plant the crop.

[Adapted from Microbiology and Biotechnology, 1994]

2.4.1 What is meant by the term genome referred to in the extract? (1)

2.4.2 State ONE way in which the genetic engineering described in the extract differs from selective breeding. (2)

2.4.3 Give ONE reason why the products of genetic engineering must undergo many tests before they can be sold. (1)

2.4.4 THREE disadvantages of genetic engineering (3)

2.4.5 THREE advantages of genetic engineering (3)

(10)

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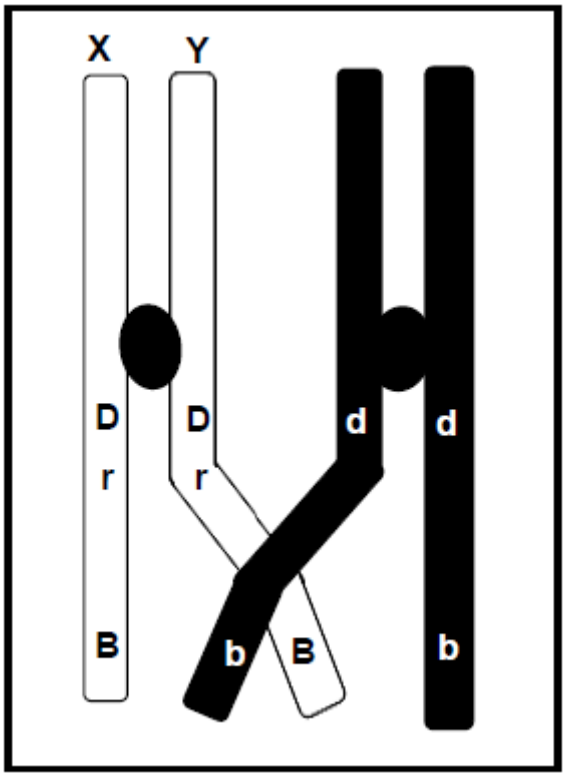
QUESTION 3

3.1 The diagram below shows crossing over during meiosis.



3.1.1 Name the phase of meiosis during which the process represented above takes place. (1)

3.1.2 Name the process that is illustrated in the diagram. (1)

3.1.3 Explain the importance of crossing over. (2)

3.1.4 Draw a diagram, giving the position of the alleles, to show the structure of chromatid Y after crossing over. (2)

(6)

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3.2 Read the extract below.

The red-bellied black snake (*Pseudechis porphyriacus*) and the green tree snake (*Denderelaphis punctulatus*) are predators that sometimes feed on cane toads (*Bufo marinus*) that contain a toxin that may kill them.

The snakes consume the toads by swallowing them whole. A decrease in the average jaw size of the snakes has been observed over a period of 70 years. Some scientists believe that this may be an example of punctuated equilibrium. With this change it was also noted that the snakes could no longer swallow the large cane toads. This has resulted in an increase in the survival of the snakes.

3.2.1 Define punctuated equilibrium. (3)

3.2.2 What characteristic of the toad species protects it from predation? (1)

3.2.3 Explain how the change in jaw size helped the snakes to survive. (3)

3.2.4 How would Lamarck have explained the development of a small jaw size in the snakes? (4)

(11)

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3.3 A species of mice have different fur colours in different habitats. Scientists observed that there were more mice with a lighter fur colour in a beach habitat where the sand was lighter in colour. Also, there were more mice with a darker fur colour in the mainland habitat where the sand was darker in colour. Owls attack and prey on the mice.

Scientists wanted to investigate how the colour of the fur affects the chances of the mice being attacked. They conducted a simulation where they used models to represent the mice.

While conducting the investigation they:

- Made clay models of the mice
- Painted 200 clay models to resemble the lighter fur colour and 200 models to resemble the darker fur colour
- Placed an equal number of mice of each colour randomly in the beach habitat and in the mainland habitat
- Allowed enough time for predators to attack the mice models
- Collected all the models and recorded the number that were damaged after being attacked

The results of the investigation are shown in the diagram below.

HABITAT	FUR COLOUR	NUMBER OF MODELS ATTACKED
Mainland	Lighter	80
	Darker	20
Beach	Lighter	26
	Darker	78

3.3.1 State TWO independent variables. (2)

3.3.2 How many mice with a lighter fur colour were placed in the beach habitat? (1)

3.3.3 State TWO ways in which the scientists ensured the reliability of the results. (2)

3.3.4 Give a conclusion for the investigation conducted in the mainland habitat. (2)

3.3.5 Explain the results obtained for the beach habitat. (4)

3.3.6 Explain why the simulation may not be an accurate representation of the survival of the mice. (2)

(13)

3.4 Tabulate the TWO differences between artificial selection and natural selection. **(5)**

TOTAL SECTION B: 80

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SECTION C

QUESTION 4

Describe the inheritance of blood groups and the use of blood groups in paternity testing.

Content:	(17)
Synthesis:	(3)
	(20)

NOTE: NO marks will be awarded for answers in the form of flow charts or diagrams.

TOTAL SECTION C:	**20**
GRAND TOTAL:	**100**

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DEPARTMENT: EDUCATION
MPUMALANGA PROVINCE

INSIKAZI CIRCUIT

GRADE 12

LIFE SCIENCES PRE TRIAL PAPER 2

2020

MARKING GUIDELINES

MARKS: 150

TIME: 2h30 MINUTES

This memorandum consists of 11 pages.

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2011

1. **If more information than marks allocated is given**
   Stop marking when maximum marks is 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 part of it is required**
   Read all and credit relevant part.

4. **If comparisons are asked for and descriptions are given**
   Accept if 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 is incorrect, do not credit. If sequence and links becomes correct again, resume credit.

9. **Non-recognized abbreviations**
   Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of 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 recognizable accept provided it does not mean something else in Life Sciences or if it is out of context**.**

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

14. **If only letter is asked for and only name is given (and vice versa)**
    No credit

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 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 appears 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	A✓✓		
	1.1.3	C✓✓		
	1.1.4	B✓✓		
	1.1.5	D✓✓		
	1.1.6	B✓✓		
	1.1.7	A✓✓		
	1.1.8	B✓✓		
	1.1.9	D✓✓		
	1.1.10	B✓✓		
			(10 x 2)	**(20)**
1.2	1.2.1	tRNA✓/transfer RNA		
	1.2.2	Cloning✓		
	1.2.3	Stem✓cells		
	1.2.4	Incomplete dominance✓		
	1.2.5	Chiasma✓/chiasmata		
	1.2.6	Ribosome✓		
	1.2.7	Allele✓		
	1.2.8	Gonosomes✓		
			(8×1)	**(8)**
1.3	1.3.1	A only✓✓		
	1.3.2	Both A and B✓✓		
	1.3.3	A only ✓✓		
	1.3.4	A only ✓✓		
			(4×2)	**(8)**
1.4	1.4.1	DNA✓/Deoxyribonucleic acid		(1)
	1.4.2	Nucleus✓/chromosome		
		Mitochondria✓		
		(Mark first TWO only)		(2)
	1.4.3	(a) Nucleotide✓		(1)
		(b) Guanine✓		(1)
		(c) Phosphate✓		(1)
		(d) Hydrogen✓ bond		(1)
	1.4.4	Double helix✓		(1)
	1.4.5	DNA replication✓		(1)
				(6)

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1.5	1.5.1	550 ✓mya (Accept any value between 545 and 555)	(1)
	1.5.2	Bacteria ✓	(1)
	1.5.3	Ferns ✓	(1)
	1.5.4	Birds ✓	(1)
	1.5.5	Reptiles ✓	(1)
			(5)

Question 1: [50]

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1	2.1.1	(a) GGT✓	(1)
		(b) AAA✓	(1)
		(c) UCA✓	(1)
	2.1.2	(a) 1✓	(1)
		(b) 198✓	(1)
		(c) 66✓	(1)
	2.1.3	- DNA has deoxyribose✓ sugar while RNA has ribose✓ sugar - DNA has nitrogen base thymine✓ / T /A,C,G and T while RNA has nitrogen base uracil✓ / U /A,C,G and U ***(Mark first two)*** 2×2	(4)
	2.1.4	- One of the base triplets on the DNA has changed✓ - from ACG to ACC✓ - The triplet ACG codes for the amino acid cysteine✓ - while the triplet ACC codes for the amino acid tryptophan✓ - resulting in a change in the sequence of amino acids✓ Any 4	(4)
			[14]

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2.2 2.2.1 (a) 3✓ (1)

(b) 3 (1)

2.2.2 (a) Hearing✓/Normal (1)

(b) Hh✓ (1)

2.2.3 - Lyall inherited one recessive allele✓

- from each parent✓ (2)

2.2.4

P_1	Phenotype	Hearing	x	Deaf✓	
	Genotype	HH	x	hh✓	
Meiosis					
	G/gametes	H H	x	h h✓	
Fertilisation					
F_1	Genotype	Hh	Hh	Hh	Hh✓

Phenotype All hearing✓
0% deaf✓*

P_1 and F_1✓
Meiosis and fertilisation✓

***1 Compulsory mark** + Any 6

OR

P_1	Phenotype	Hearing	x	Deaf ✓
	Genotype	HH	x	hh ✓

Meiosis

Fertilisation

Gametes	H	H
h	Hh	Hh
h	Hh	Hh

1 mark for correct gametes
1 mark for correct genotypes

F_1 Phenotype All hearing✓
0% deaf ✓*

P_1 and F_1✓
Meiosis and fertilisation✓

***1 Compulsory mark** + Any 6

(7)

[13]

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2.3 2.3.1 (a) RRLL✓ (1)

(b) Red fruit✓ and spiny leaves✓ (2)

2.3.2 (3/16) ✓ x 128✓ = 24✓ (3)

2.3.3 - rrLL✓✓

OR

- One parent is rrLL and the other parent is rrLl✓✓ (2)

[8]

2.4 2.4.1 An organism's complete set of genes✓ (1)

2.4.2 Genetic engineering: involves the transfer of genes✓ from one organism to another/(manipulation of DNA)

Selective breeding: Parents with desirable phenotypes are selected to produce offspring with desirable phenotypes✓

OR

Genetic engineering can involve gene transfer between organisms from different kingdoms✓

Selective breeding can occur using organisms from the same or different species within a kingdom✓ (2)

2.4.3 - To assess the risks to human health ✓/the environment

- To determine if the presence of the transferred gene will affect the expression of other genes✓
- To test the effectiveness✓of the product

(Mark first ONE only) Any (2)

2.4.4 • Expensive✓

• May be difficult for poor people to access ✓

• Interfere with nature✓

• Immoral✓/ we cannot play God

• Loss of biodiversity✓

• Potential health impacts✓

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• Unsure of long term effects✓
• Genes from transgenic organisms could escape✓and be transferred to wild organisms
(Mark first THREE only) (3)

2.4.5 • Production of medication✓
• Production of resources cheaply✓
• Control pests with specific genes inserted into the crop✓
• Selecting the best genes to produce better resistant crops✓
• Using specific genes to increase crop yields✓ / food security
• Selecting genes to increase shelf life of plant products✓
• Using specific genes to improve nutritional value✓of food for better health
• Improve the taste✓ of food
• Endangered species can be saved✓
(Mark first THREE only) (3)
[9]

QUESTION 3

3.1 3.1.1 Prophase I✓ (1)

3.1.2 Crossing over✓ (1)

3.1.3 - Crossing over introduces genetic variation✓ in gametes
- It may lead to new characteristics which are favourable✓
- or new characteristics which are unfavourable✓
- therefore affecting the chances of survival of the organism✓/ natural selection. **Any2** (2)

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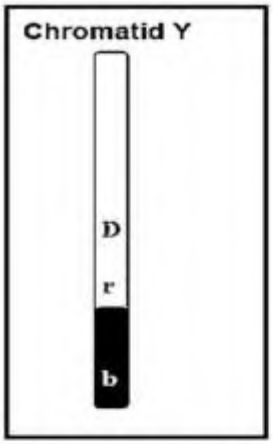
3.1.4



ASSESSING THE DIAGRAM	
CRITERIA	MARKS
Chromatid Y represented (must be labelled if a whole chromosome is represented)	1
Alleles indicated correctly	1

(2)
[6]

3.2 3.2.1 - It is characterised by long periods of little or no change✓
- alternating with short periods of rapid change✓
- during which new species may form✓ (3)

3.2.2 They contain toxins✓ which kill the snakes

OR

Too large✓ to be swallowed (1)

3.2.3 - Having a smaller jaw✓
- means cane toads cannot be consumed✓
- thereby protecting the snakes from ingesting the toxins✓ (3)

3.2.4 - Since the snakes' jaws were used less ✓/not used
- the snakes developed smaller jaws✓
- This characteristic (of a smaller jaw) was inherited by the offspring✓
- Over many generations the jaw of the snake became smaller✓ (4)

[11]

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3.3 3.3.1 - Habitat✓/colour of sand
- Fur colour✓
(Mark first TWO only) (2)

3.3.2 100✓ (1)

3.3.3 - They used a large sample size✓/200 models per habitat/ 200 models per fur colour/ 400 models in total
- Allowed enough time for predators to attack the models✓
- Placed mice randomly in each habitat ✓
(Mark first TWO only) Any 2 (2)

3.3.4 The darker coloured models were attacked less ✓✓than the lighter coloured models

OR

The lighter coloured models were attacked more✓✓ than the darker coloured models (2)

3.3.5 - More mice/78 models with dark fur colour were attacked✓ in the beach habitat
- as they were more visible✓/less camouflaged against the light coloured sand
- Fewer mice with light fur colour/26 models were attacked✓ in the beach habitat
- as they are less visible✓ /well camouflaged against the light coloured sand (4)

3.3.6 - The clay models are not able to escape✓ from predators
- and therefore they would be attacked more frequently✓

OR

- The owls will not recognise the models as prey✓and
- therefore will attack less frequently✓

OR

-If the models showed signs of an attack✓
-it doesn't give an indication of their survival ✓ (2)

[13]

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3.4 ✓ (Table)

Artificial selection	Natural selection
Humans select the desirable characteristics ✓	Selective pressure by the environment ✓
Selected characteristics are not necessarily advantageous for the survival in the natural environment ✓	Selected characteristics are advantageous for survival in the environment ✓
Leads to a new breed ✓of the plant or animal	Can lead to a new species✓
Could be labour intensive✓/expensive	No human effort✓/cost involved

(Mark first TWO only) any 2 × 2 + 1 table

[5]

TOTAL SECTION B: [80]

SECTION C

QUESTION 4

Inheritance of blood groups

- Blood groups in humans is controlled by one gene✓/AOB gene
- with three alleles✓/ I^A, I^B, i
- Each person inherits any 2 of the three alleles✓ from their parents
- I^A and I^B alleles are co-dominant✓
- I^A and I^B are dominant over the i allele✓/ the i allele is recessive to I^A and I^B

- Inheriting the I^A allele from both parents✓/ having the genotype I^AI^A
- or inheriting the I^A allele from one parent and i from the other parent✓/ having the genotype I^Ai
- results in **blood group A**✓

- Inheriting the I^B allele from both parents✓/ having the genotype I^BI^B
- or inheriting the I^B allele from one parent and i from the other parent✓/ having the genotype I^Bi
- results in **blood group B**✓

- Inheriting I^A from one parent and inheriting I^B from the other parent✓/having the genotype I^AI^B
- results in the **AB blood group**✓

- Inheriting the i allele from both parents✓/having the genotype ii
- results in **blood group O** ✓ **Max 12**

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Use of blood groups in paternity testing

- If a genetic diagram shows that the mother and the man could produce a child with a particular blood group✓
- then he may be the father✓
- but we cannot say for sure that he is the father✓
- because there are many males with the same blood type✓

- If a genetic diagram shows that the mother and the man could not produce a child with a particular blood group✓
- then he is definitely not the father✓ **Max 5** (3)

(17)

Content:
Synthesis:

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
General	All information provided is relevant to the question.	Ideas are arranged in a logical/cause-effect sequence.	Answered all aspects required by the essay in sufficiently detail.
In this essay in Q4	Only provided information relevant to: - The inheritance of blood groups - The use of blood groups in paternity testing No irrelevant information included.	Information on: - The inheritance of blood groups - The use of blood groups in paternity testing is presented in a logical and sequential manner.	At least the following marks should be obtained: - The inheritance of blood groups 8/12 - The use of blood groups in paternity testing 3/5
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 100

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