



**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

**CURRICULUM GRADE 10 -12 DIRECTORATE**

**NCS (CAPS) SUPPORT**

**LAST PUSH EDUCATOR DOCUMENT**

**LIFE SCIENCES: PAPER 1&2**

**GRADE 12**

**2024**



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**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

**LIFE SCIENCES**

**REVISION TOPIC TEST:**

**REPRODUCTION 1**

**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**



**This marking guideline consists of 5 pages.**

## RINCIPLES RELATED TO MARKING LIFE SCIENCES

- 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 a part of it is required**  
Read all and credit the relevant part.
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- 14. If only the letter is asked for, but only the name is given (and vice versa)**  
Do not 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.

**SECTION A**

**QUESTION 1**

1.1	1.1.1	D ✓✓		
	1.1.2	A ✓✓		
	1.1.3	B ✓✓		
			(3 x 2)	<b>(6)</b>
1.2	1.2.1	Mitochondrion/ mitochondria ✓		
	1.2.2	Cervix ✓		
	1.2.3	Ovary ✓		
	1.2.4	Vivipary ✓		
			(4 x 1)	<b>(4)</b>
1.3	1.3.1	Both A and B ✓✓		
	1.3.1	B only ✓✓		
			(2 x 2)	<b>(4)</b>
1.4	1.4.1	(a) E ✓ - testis ✓		(2)
		(b) C ✓ - vas deferens ✓		(2)
	1.4.2	-Produces a fluid which is alkaline ✓ -It contains mucus ✓ -It contains nutrients ✓ <b>(Mark the first TWO only)</b>		
			(2 x 1)	(2)
				<b>(6)</b>
			<b>TOTAL SECTION A:</b>	<b>20</b>

**SECTION B**

**QUESTION 2**

2.1	2.1.1	-External fertilisation ✓		(1)
	2.1.2	-Internal fertilisation ✓ -increases the chances of fertilisation ✓ -Ovovivipary ✓ / eggs are retained inside female's body -where they are protected <b>(Mark the first TWO only)</b>		
			(2 x 2)	<b>(4)</b>
	2.1.3	- To increase chances of fertilisation ✓ / the survival of the eggs/ number of offspring		(1)
				<b>(6)</b>
2.2	2.2.1	B - endometrium ✓		(1)

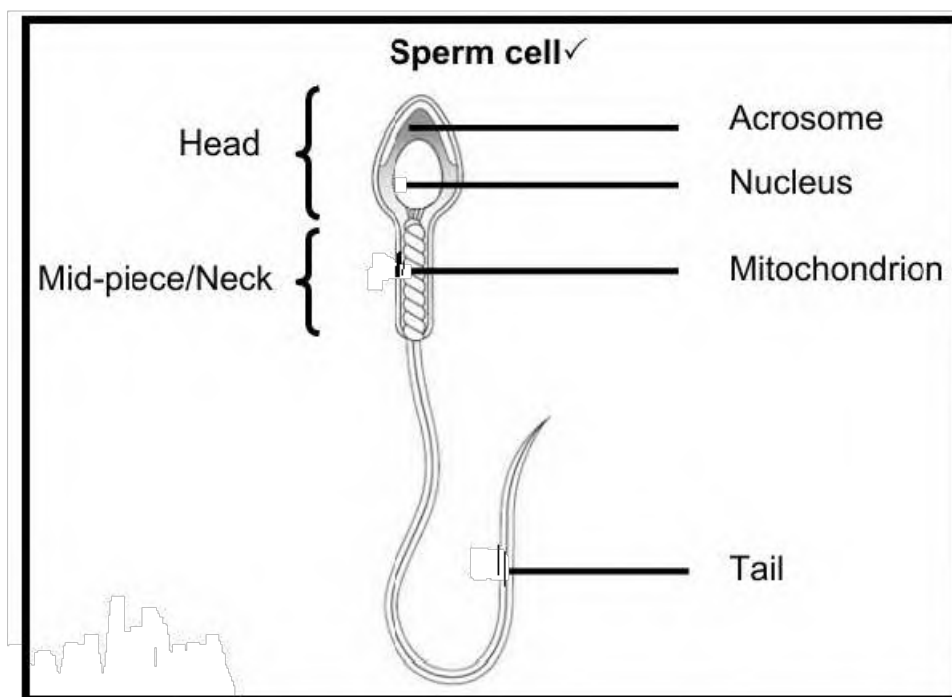
- 2.2.2 It is muscular✓  
to protect the foetus from mechanical injury✓/to allow for parturition/birth  
-It is flexible✓/can expand  
to accommodate the growing foetus✓  
-It is hollow✓  
to accommodate the growing foetus✓  
-The thickened endometrium✓  
allows for implantation /survival of the embryo✓  
**(Mark the first answer only)**

(2)

- 2.2.3 -The nucleus of the sperm✓ fuses with the nucleus of the ovum✓

(2)

2.2.4



The structure of a sperm cell

- Correct drawing (D) - 1 mark**  
**Correct caption (C) - 1 mark**  
**Any two correct labels(L) - 2 marks**

(4)  
(9)  
(15)

**QUESTION 3**

- 3.1 - Diploid cells in the ovary undergo mitosis✓  
- to form numerous follicles✓  
- At the onset of puberty and under the influence of FSH✓  
- one cell inside a follicle enlarges and undergoes meiosis✓  
- Of the four cells that are produced, only one survives to form a mature haploid ovum. ✓

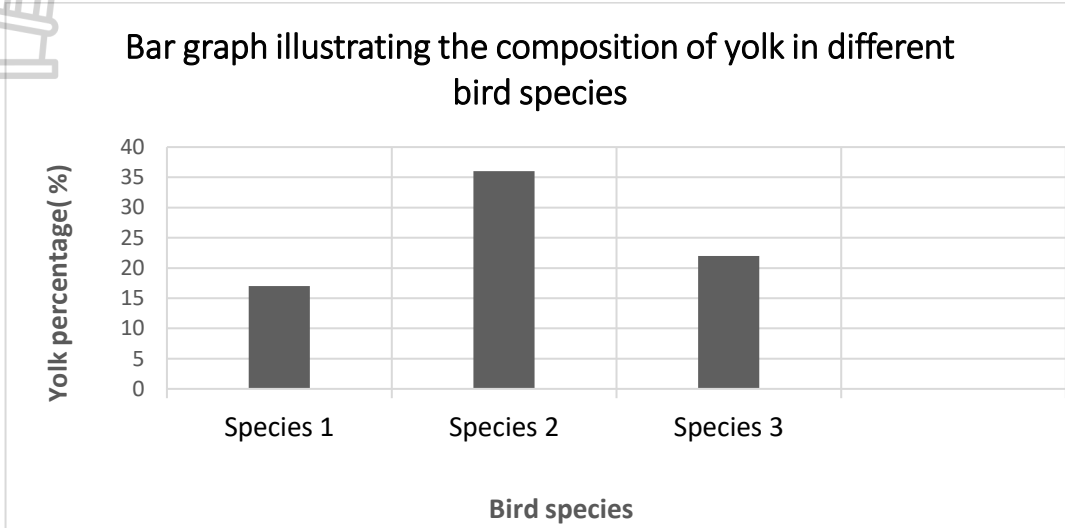
(any 4) **(4)**

3.2 3.2.1 -Species 1 ✓ (1)

3.2.2 -The egg contains the least amount of yolk ✓  
 -Indicating that the chick will be less developed when it hatches ✓ (2)

3.2.3 The shell is porous ✓ allowing for gaseous exchange ✓ (2)

3.2.4



(6)  
 (11)  
 (15)

Bar graph drawn	1
Title of graph	1
Correct label for X-axis and Y-axis with units	1
Correct scale for X-axis (same width of bars and spaces between bars) and Y-axis	1
Drawing of bars	1: 1 to 3 bars plotted correctly 2: All 4 bars plotted correctly

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**



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GRADE 12

**LIFE SCIENCES**

**REVISION TOPIC TEST:**

**REPRODUCTION 2**

**MARKING GUIDELINES**

**MARKS: 50**

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

**QUESTION 1**

- |      |        |                                                     |         |                |
|------|--------|-----------------------------------------------------|---------|----------------|
| 1.1  | 1.1.1  | D ✓✓                                                |         |                |
|      | 1.1.2  | A ✓✓                                                |         |                |
|      | 1.1.3  | B ✓✓                                                |         |                |
|      |        |                                                     | (3x2)   | <b>(6)</b>     |
| 1.2  | 1.2.1  | Placenta ✓                                          |         |                |
|      | 1.2.2  | Implantation ✓                                      |         |                |
|      | 1.2.3  | Amniotic fluid ✓                                    |         |                |
|      | 1.2.4  | Menstruation ✓                                      |         |                |
|      |        |                                                     | (4 x 1) | <b>(4)</b>     |
| 1.3  | 1.3.1  | B only ✓✓                                           |         |                |
|      | 1.3.2  | Both A and B ✓✓                                     |         |                |
|      |        |                                                     |         | <b>(4)</b>     |
| 1.4. | 1.4.1. | (a) Pituitary ✓ gland / Hypophysis                  |         | (1)            |
|      |        | (b) Graafian follicle ✓                             |         | (1)            |
|      |        | (c) Ovulation ✓                                     |         | (1)            |
|      |        | (d) Corpus luteum ✓                                 |         | (1)            |
|      | 1.4.2  | Remain low ✓ / decreases                            |         | (1)            |
|      | 1.4.3  | - Stimulates ovulation ✓                            |         |                |
|      |        | - Stimulates the development of the corpus luteum ✓ |         |                |
|      |        | <b>Mark first ONE only</b>                          |         | <b>Any (1)</b> |

**(6)**

**TOTAL SECTION A: (20)**

**SECTION B****QUESTION 2**

- 2.1. 2.1.1 - Stimulates ovulation ✓ (2)  
 - Stimulates the development of the corpus luteum ✓ (2)  
**(Mark first TWO only)**
- 2.1.2. Follicle stimulating hormone ✓ /FSH (1)  
**(Mark first ONE only)**
- 2.1.3 Progesterone ✓ (1)
- 2.1.4 - The (progesterone) levels will remain low ✓  
 - The LH levels are low ✓ therefore  
 - ovulation will not take place ✓ and  
 - no corpus luteum will develop ✓ (4)
- 2.1.5. Hormone X /progesterone levels remain high ✓ (1)
- 2.2 - After implantation the chorion ✓  
 - develops many finger-like outgrowths ✓  
 - called chorionic villi ✓  
 - The endometrium ✓  
 - together with the chorionic villi forms the placenta ✓  
 - The umbilical artery ✓  
 - and the umbilical vein ✓ develops  
 - inside a hollow tube ✓ to form the umbilical cord between the foetus and the placenta

**[9]****(Any 6) (6)****QUESTION 3**

- 3.1 3.1.1. (a) Progesterone treatment ✓ (1)  
 (b) Development of gestational diabetes ✓ (1)
- 3.1.2 Progesterone maintains/thickens the endometrium ✓ and therefore, maintains the pregnancy ✓ (2)
- 3.1.3 Same) dosage/250 mg of progesterone ✓  
 (Same) period of time for injection injections given between weeks 16 and 20 ✓  
 (Same) frequency of injections/weekly injections ✓. (2)  
**(Mark the first two)**
- 3.1.4 • Glucose levels were taken daily ✓  
 • When the glucose level of a pregnant woman remains high continuously it indicates the development of gestational diabetes. ✓ (2)
- 3.1.5 Group B did not receive progesterone ✓  
 If gestational diabetes develops in group A it would be due to the progesterone treatment ✓ (2)

**(10)**

	3.2.	<ul style="list-style-type: none"> <li>- The Graafian follicle ✓</li> <li>- secretes oestrogen ✓</li> <li>- causing the endometrium to become thick ✓ /glandular or vascular</li> <li>- The corpus luteum ✓</li> <li>- secretes progesterone ✓</li> <li>- which (further) increases the thickness of the endometrium ✓</li> <li>- High levels of progesterone inhibit FSH secretions ✓</li> </ul> <p style="text-align: right;"><b>(Any 5)</b></p>	(5)
--	------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----

[15]

**TOTAL SECTION B: (30)**

**GRAND TOTAL: [50]**





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NATIONAL

LIFE SCIENCES

REVISION TOPIC TEST:

**HUMAN RESPONSE TO THE ENVIRONMENT 1**

MARKS: 50

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**SECTION A**

**QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	A ✓✓		
	1.1.3	C ✓✓		
			(3 x 2)	<b>(6)</b>
1.2	1.2.1	Meninges ✓		
	1.2.2	Stimulus ✓		
	1.2.3	Neurons ✓		
			(3 x 1)	<b>(4)</b>
1.3	1.3.1	B only ✓✓		
	1.3.2	B only ✓✓		
			(2 x 2)	<b>(4)</b>
1.4	1.4.1	- Brain ✓ - Spinal Cord ✓ <b>( Mark first TWO only)</b>		<b>(2)</b>
	1.4.2	Cerebellum ✓		<b>(1)</b>
	1.4.3	C ✓ Medulla Oblongata ✓		<b>(2)</b>
		A ✓ Cerebrum ✓		<b>(2)</b>
				<b>(7)</b>
			<b>TOTAL SECTION A:</b>	<b>(20)</b>

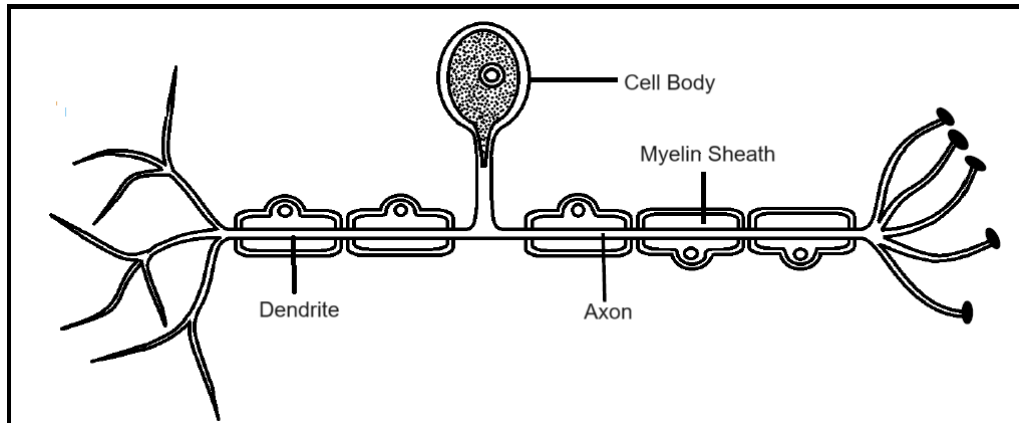


**SECTION B**

**QUESTION 2**

2.1 2.1.1 (a) E ✓  
 (b) A ✓  
 2.1.2

(1)  
 (1)



Criteria for marking diagram

<b>Caption for the neuron (C)</b>	✓
<b>Correct drawing of the neuron (D)</b>	✓
<b>Any TWO correct labels (L)</b>	✓✓

(4)  
 (6)

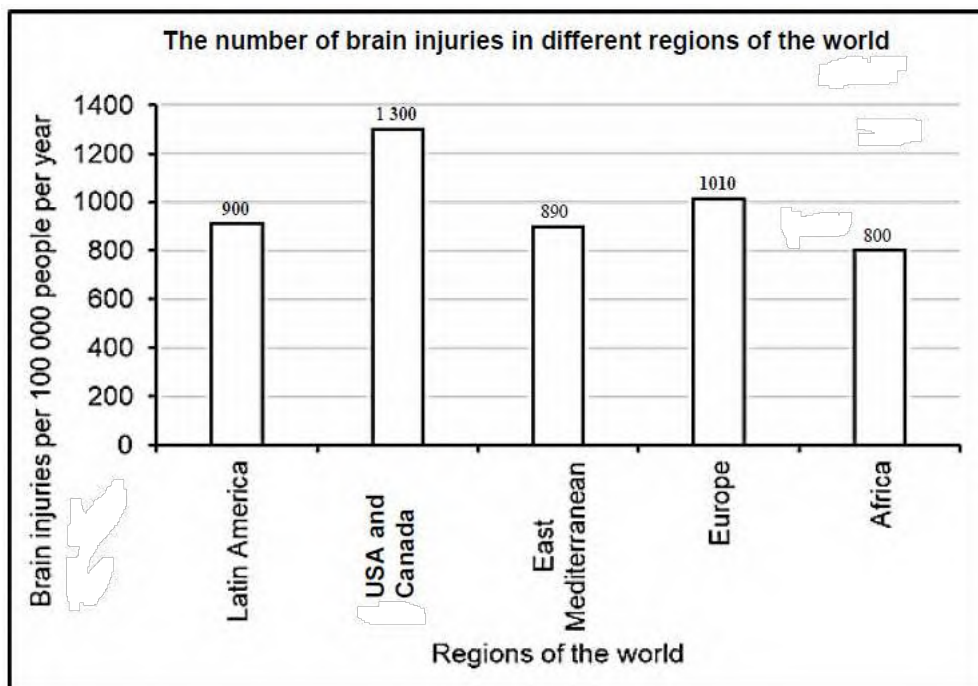




2.2 2.2.1 - Africa ✓ (1)

2.2.2 - Not all brain injuries are recorded ✓  
 - due to poor health facilities ✓ (2)

2.2.3



**Criteria for marking graph:**

Criteria	Mark allocation
Bar graph is drawn (T)	1
Caption of the graph includes both variables (C)	1
Correct labels on X-axis and Y-axis (L)	1
Correct scale for Y-axis	1
Equal spaces between bars and equal width of bars for X-axis (S)	1
Plotting: (P)	
1-4 co-ordinates plotted correctly	1
All 5 co-ordinates plotted correctly	2

(6)

(9)

(15)

**QUESTION 3**

- 3.1 3.1.1 -The pathway along which impulses are transmitted ✓  
 - to bring about reflex action ✓ (2)
- 3.1.2 (a) Guillain-Barré syndrome ✓ (1)  
**( Mark first ONE only)**
- (b) Damage to the motor neurons ✓ (1)  
**( Mark first ONE only)**
- (c) The skeletal muscles have a decreased reflex response ✓ (1)  
**( Mark first ONE only)**
- 3.1.3 - In Hyporeflexia damage is between the spinal cord and the skeletal muscles ✓ while  
 - In Hyperreflexia damage is between the brain and the spinal cord ✓ (2)
- 3.1.4 Myelin Sheath ✓ (1)
- 3.1.5 - Axon is no longer insulated ✓  
 - This causes the speed of transmission of nerve impulses to decrease ✓  
 - which can lead to a delayed response ✓ and  
 - therefore, loss of muscle control ✓ Any 3 (3)
- (11)**
- 3.2 - Every organ / gland is controlled by two sets of nerves ✓  
 - that act antagonistically ✓  
 - The autonomic nervous system is divided into  
 - the sympathetic nerves ✓ and  
 - Parasympathetic ✓ nerves  
 - Sympathetic nerves stimulate ✓  
 - fight or flight function ✓ in emergency situations  
 - Parasympathetic inhibits ✓ a response and  
 - restores the body to normal ✓ Any 4 (4)
- (15)**

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**



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**SECTION A****QUESTION 1**

1.1	1.1.1	A ✓✓		
	1.1.2	B ✓✓		
	1.1.3	D ✓✓		
			(3x2)	<b>[6]</b>
1.2	1.2.1	Accommodation ✓		
	1.2.2	Cristae ✓		
	1.2.3	Binocular ✓ Vision		
	1.2.4	Cochlea ✓		
			(4 x 1)	<b>[4]</b>
1.3	1.3.1	None ✓✓		
	1.3.1	A only ✓✓		
			(2x2)	<b>[4]</b>
1.4	1.4.1	(a) A ✓		(1)
		(b) B ✓		(1)
	1.4.2	(a) 3 ✓		(1)
		(b) 2 ✓		(1)
	1.4.3	(a) Circular ✓		(1)
		(b) Circular ✓		(1)
				<b>[6]</b>
			<b>TOTAL SECTION A:</b>	<b>[20]</b>

**SECTION B****QUESTION 2**

2.1	2.1.1	Accommodation ✓		(1)
	2.1.2	The smaller the distance of the object is from the eye the larger the (central) diameter of the lens ✓✓		
		<b>OR</b>		
		The (central) diameter of the lenses increases if the object is closer to the eye ✓✓		(2)
	2.1.3	-The lens is elastic ✓ and can change shape/convexity ✓ to allow for accommodation.		(6)
		-The lens is transparent ✓ to allow the light to pass through ✓		
		-The lens is biconvex ✓ to refract light rays ✓		
		<b>(Mark first three only)</b>	<b>Any (2x3)</b>	

**[9]**

- 2.2 -Ciliary muscles relax ✓  
 -suspensory ligaments become taut ✓  
 -ciliary body moves further away from the lens ✓  
 -tension on the lens increases ✓  
 -lens become less convex ✓  
 -refractive power of the lens decreases ✓  
 -a clear image is formed on the retina ✓
- Any 6 (6)**

**[15]**

**QUESTION 3**

3. 3.1.1 Cochlea ✓ (1)

3.1.2  $\left[ \frac{130\,000 - 85\,000}{85\,000} \right] \times 100 = 52,94\%$  ✓ (3)

- 3.1.3 -More factories ✓ were built increase in supply & demand more workers ✓ were employed  
 -Extended exposure to loud sounds ✓  
 -Lack of precautionary measures ✓
- Any 3 (3)**
- (Mark first three only)**

- 3.1.4 -The impulse will not be transmitted to the cerebrum ✓  
 -and will not be interpreted ✓ (2)

- 3.2 (9)

- The cristae are stimulated ✓ and  
 -convert the stimuli into impulses ✓  
 -the impulses are sent via the auditory nerve ✓  
 -to the cerebellum ✓  
 -which interprets the information ✓ and  
 -sends impulses to the skeletal muscles ✓  
 -to restore balance ✓
- Any 6 (6)**

**[15]**

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**



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REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

**LIFE SCIENCES**  
**REVISION TOPIC TEST:**  
**PLANT RESPONSE**  
**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**



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**SECTION A**

**QUESTION 1**

- 1.1 1.1.1 C ✓✓  
 1.1.2 B ✓✓  
 1.1.3 D ✓✓  
 (3x2) (6)
- 1.2 1.2.1 Absciscic Acid ✓  
 1.2.2 Geotropism ✓  
 1.2.3 Apical Dominance ✓  
 (3 x 1) (3)
- 1.3 1.3.1 None ✓✓  
 1.3.1 B only ✓✓  
 (2x2) (4)
- 1.4 1.4.1 - caffeine ✓  
 - nicotine ✓  
**(mark first TWO only)** (2)
- 1.4.2 - The bitter taste ✓  
 Will prevent herbivores ✓ from feeding on them  
 - The caffeine will kill pathogenic fungi ✓ protecting the plants from  
 disease ✓ / death Any (2X2)  
**(mark first TWO)** (4)
- 1.4.3 Thorns ✓ **(mark first ONE)** (1)
- (7)

**TOTAL SECTION A: (20)**

**SECTION B**

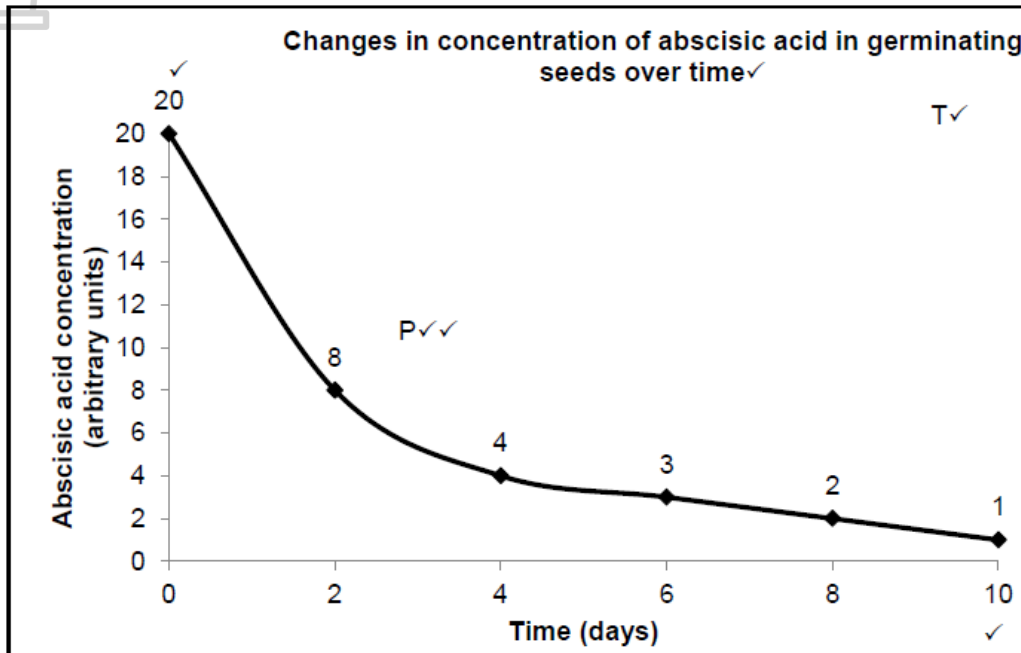
**QUESTION 2**

- 2.1 2.1.1 (a) Geotropism ✓ (1)  
 (b) Auxins ✓ (1)
- 2.1.2 - Due to gravity ✓  
 - There is a higher concentration of auxins on the upper side ✓ of the  
 roots  
 - Which inhibits growth ✓  
 - Therefore, growth will occur mainly on the upper side ✓  
 - Causing the root to bend / grow downwards ✓ (5)

- 2.1.3 - The seedling must be rotated constantly ✓
- To remove the effect of gravity ✓

(2)  
(9)

2.2 2.2.1



**Mark allocation of the graph**

Criteria	Mark Allocation
Correct type of graph including the joining of points	1
Title of graph	1
Correct scale, label and unit for X-axis	1
Correct scale, label and unit for Y-axis	1
Drawing of the graph	0: No points plotted correctly 1: 1 to 5 points plotted correctly 2: All 6 points plotted correctly

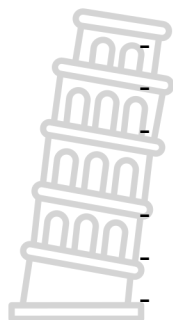
**NOTE:**

If the wrong type of graph is drawn: Marks will be lost for "correct type of graph".  
If axes are transposed: Marks will be lost only for labelling of X-axis and Y-axis.

- 2.2.2 (a) Decreased
- (b) Increased

(6)  
(1)  
(1)  
(8)

2.3



- Auxins✓
- Are sensitive to light✓
- Light stimulus from one side causes auxins to move to the shaded✓
- side/destroyed on the illuminated side✓
- Auxins concentration is higher on the shaded side of plant✓
- Resulting in more growth on the side✓
- Stems grows towards the light stimulus✓
- This is called phototropism✓

(Any 4)

(4)

[15]

### QUESTION 3

- 3.1 (a) Auxin concentration✓  
(b) Plumule growth✓ (2)
- 3.2 For measurement of the plumule length✓ (1)
- 3.3 - They use seven seedlings in each group✓//36 seeds in total/a large sample  
- They calculated the average✓ increase in plumule length (2)  
**(mark first ONE only)**
- 3.1.4 - Same species of beans✓  
- Seedlings of the same age✓  
- Seedlings of the same size✓  
- Same temperature✓  
- The same investigation✓  
- Identical apparatus ( beakers/petri-dishes/graph paper/grid) ✓ (1)
- 3.1.5 An increase in auxins concentration up to an optimum/10ppm stimulates the growth rate of the plumule/stem. Which further increase in auxin concentration there is an inhibition of plumule/ stem growth✓✓ (2)
- 3.1.6 Gibberellins ✓  
Abscisic Acid✓  
(mark first ONE only) (2)

**TOTAL SECTION B: (30)**

**GRAND TOTAL: [50]**



## KWAZULU-NATAL PROVINCE

EDUCATION  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

LIFE SCIENCES

REVISION TEST:  
ENDOCRINE SYSTEM & HOMEOSTASIS

**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**

This marking guideline consists of 4 pages including cover page.

## PRINCIPLES RELATED TO MARKING LIFE SCIENCES

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- 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.

**SECTION A**

**QUESTION 1**

- |     |       |                                        |        |            |
|-----|-------|----------------------------------------|--------|------------|
| 1.1 | 1.1.1 | D ✓✓                                   |        |            |
|     | 1.1.2 | C ✓✓                                   |        |            |
|     | 1.1.3 | C ✓✓                                   | (3x2)  | <b>(6)</b> |
| 1.2 | 1.2.1 | Islets of Langerhans ✓                 |        |            |
|     | 1.2.2 | ADH ✓                                  |        |            |
|     | 1.2.3 | Adrenalin ✓                            |        |            |
|     | 1.2.4 | Glycogen ✓                             | (4 x1) | <b>(4)</b> |
| 1.3 | 1.3.1 | Both A and B ✓✓                        |        |            |
|     | 1.3.2 | A only ✓✓                              | (2x2)  | <b>(4)</b> |
| 1.4 | 1.4.1 | Negative feedback ✓ mechanism          |        | (1)        |
|     | 1.4.2 | (a) Thyroid ✓                          |        | (1)        |
|     |       | (b) TSH ✓ /thyroid stimulating hormone |        | (1)        |
|     |       | (c) Thyroxin ✓                         |        | (1)        |
|     | 1.4.3 | Goitre ✓                               |        | (1)        |
|     | 1.4.4 | Hormone A ✓                            |        | (1)        |
|     |       |                                        |        | <b>(6)</b> |

**TOTAL SECTION A: 20**

**SECTION B**

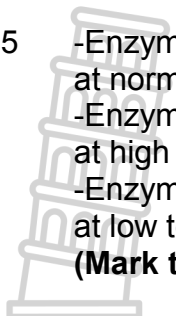
**QUESTION 2**

- |    |     |                                                                                                                                                                                                                                                                                                |  |     |
|----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----|
| 2. | 2.1 | (a) Thermoregulation ✓                                                                                                                                                                                                                                                                         |  | (1) |
|    |     | (b) Hypothalamus ✓                                                                                                                                                                                                                                                                             |  | (1) |
|    | 2.2 | (a) Sweat gland ✓                                                                                                                                                                                                                                                                              |  | (1) |
|    |     | (b) Capillary ✓/ blood vessel                                                                                                                                                                                                                                                                  |  | (1) |
|    | 2.3 | $\frac{(37,4 - 35,4)}{37,4} \times 100 = 5,35\%$ ✓                                                                                                                                                                                                                                             |  | (3) |
|    | 2.4 | - Skin temperature decreased ✓ / lowers from 37,4 °C to 35,4 °C<br>- because part Q dilated ✓ / vasodilated<br>- causing more blood to flow to the (surface of the) skin ✓ and<br>- part P became (more) active ✓ / produced more sweat<br>- causing more heat to be lost ✓ to the environment |  |     |



- through evaporation✓/ radiation/ convection (6)

2.5 -Enzymes function optimally✓  
 at normal body temperature✓/37°C  
 -Enzymes/proteins will denature✓  
 at high temperature✓  
 -Enzymes will become inactive✓  
 at low temperature✓  
**(Mark the first ONE only)** (2)



**(15)**

**QUESTION 3**

3. 3.1 Adrenal✓ gland (1)

3.2 (a) Aldosterone level ✓/ increased aldosterone level (1)

(b) Blood pressure✓ (1)

3.3 1 688 volunteers were used✓  
 The procedure was done 4 times for each individual✓ (2)

3.4 - All factors should be kept constant✓ /there should be only one independent variable to ensure the validity✓ of the investigation  
 -Dietary factors✓ /examples can also influence the blood pressure✓ (4)

3.5 To compare the blood pressure before and after the administration of aldosterone✓✓ (2)

3.6 - The high aldosterone✓ level  
 - will increase the permeability of the renal tubules✓ for salt  
 - More salt will be reabsorbed✓ (3)

3.7 - health status of the participants✓  
 - age✓  
 - dose of aldosterone✓  
 - number of days✓  
 -diet✓  
**(Mark the first ONE only)** (1)



(Any 1) (1)

**(15)**



## **KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

**NATIONAL**

**GRADE 12**

**LIFE SCIENCES**

**REVISION TEST: DNA CODE OF LIFE**

**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**

**This marking guideline consists of 5 pages.**



**PRINCIPLES RELATED TO MARKING LIFE SCIENCES**

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**SECTION A**

**QUESTION 1**

- 1.1 1.1.1 C✓✓
- 1.1.2 C✓✓
- 1.1.3 B✓✓

(3x2) (6)

- 1.2 1.2.1 DNA profiling✓
- 1.2.2 Double helix✓
- 1.2.3 Gene mutation✓
- 1.2.4 Peptide✓ bond

(4 x 1) (4)

- 1.3 1.3.1 A Only✓✓
- 1.3.2 Both A and B✓✓

(2x2) (4)

- 1.4 1.4.1 (a) W - Nucleotide✓  
U - DNA✓

(2)

- (b) X - Phosphate✓  
Y - Deoxyribose ✓

(2)

- (c) (Weak) Hydrogen✓ bond

(1)

- 1.4.2 Interphase ✓

(1)

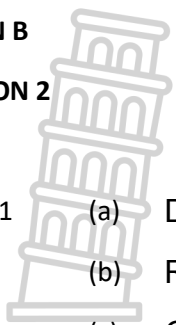
(6)



**TOTAL SECTION A: 20]**

SECTION B

QUESTION 2



- 2 2.1 (a) DNA ✓ (1)  
 (b) Ribosome ✓ (1)  
 (c) Guanine ✓ (G) (1)

- 2.2 - DNA code for a particular protein ✓  
 - One strand of DNA is used as a template ✓  
 - to form mRNA ✓ (3)

2.3

Molecule X	Molecule Y
- Double stranded ✓	- Single stranded ✓
- Has Thymine ✓	- Has Uracil ✓

Mark the first ONE Only

+ 1 for table (3)

- 2.4 Methionine ✓, Glycine ✓, Arginine ✓ (in the correct order) (3)

- 2.5 - The change in the mRNA codon does not change the amino acid sequence ✓  
 - and hence the protein formed remains the same ✓  
 - since the changed DNA triplet still codes for the same amino acid ✓, arginine (3)



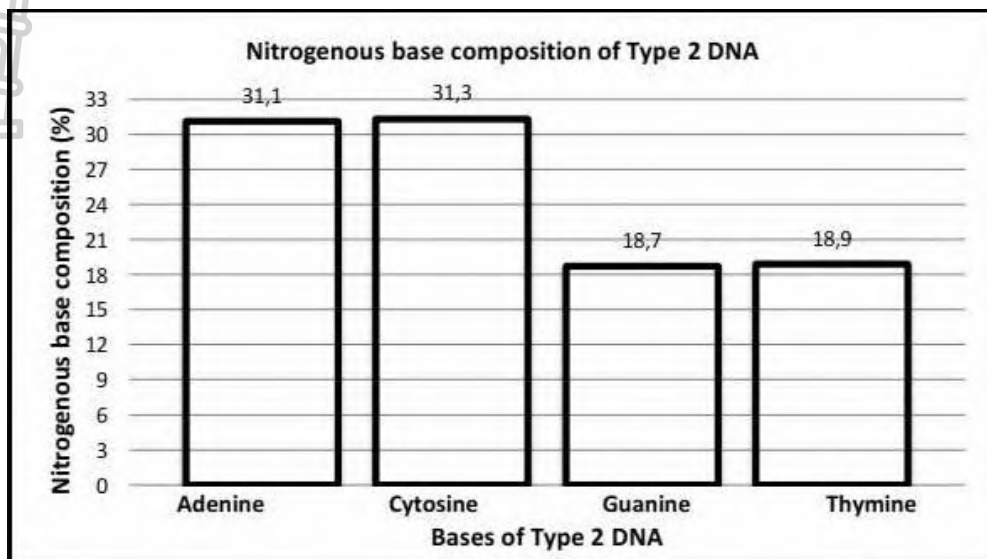
[15]

QUESTION 3

3 3.1 Type of DNA ✓

(1)

3.2



Criteria	Mark Allocation
Bar graph drawn for Type 2 DNA only	1
Title of graph (2 variables)	1
Correct scale for X-axis (equal width and spacing of the bars) and Y-axis	1
Correct label X-axis (including unit) and Y-axis	1
Plotting of the bars	0: No bars plotted correctly 1: 1 to 3 bars plotted correctly 2: All 4 bars plotted correctly

**NOTE:**

If a line graph is drawn – marks will be **awarded** for the 'title and label for X and Y axes' only

If a histogram is drawn – marks will be **lost** for the 'type of graph and correct scale' only


(6)

3.3 - Repeat the investigation ✓

- Take several readings and determine the average ✓

- Increase the sample size ✓

(2)

- 
- 3.4 - Same amount of sample for both test tubes 1 and 2✓  
- Technique used to extract or determine amount of nitrogen base composition must be the same for both test tubes✓  
- The environmental conditions must be the same✓ (1)

- 3.5 - Since the ratio of adenine: thymine is the same✓  
- and the ratio of guanine: cytosine is the same✓ (1)

- 3.6 - Invasion or personal privacy✓  
- May be used for other unintended purposes✓  
- Too costly✓  
- Confidentiality may not be maintained✓  
- Mistakes in compiling the database✓ (2)

[15]

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**

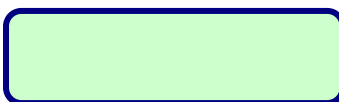




# KWAZULU-NATAL PROVINCE

EDUCATION  
REPUBLIC OF SOUTH AFRICA

NATIONAL  
SENIOR CERTIFICATE



LIFE SCIENCES

REVISION TEST: MEIOSIS

MARKS: 50

TIME: 60 minutes



This marking guideline consists of 5 pages.

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

**SECTION A**

**QUESTION 1**

1.1	1.1.1	A ✓✓		
	1.1.2	A ✓✓		
	1.1.3	D ✓✓	(3x2)	<b>(6)</b>
1.2	1.2.1	Cytokinesis ✓		
	1.2.2	Centrosome ✓		
	1.2.3	Centromere ✓		
	1.2.4	Gene ✓	(4 x 1)	<b>(4)</b>
1.3	1.3.1	None ✓✓		
	1.3.1	B only ✓✓	(2x2)	<b>(4)</b>
1.4	1.4.1	Spermatogenesis ✓		(1)
	1.4.2	Telophase I ✓		(1)
	1.4.3	Sperm cell ✓		(1)
	1.4.4	Testosterone ✓		(1)
	1.4.5	(i) 23 ✓		(1)
		(ii) 23 ✓		(1)
				<b>(6)</b>
<b>TOTAL SECTION A:</b>				<b>[20]</b>

**SECTION B**

**QUESTION 2**

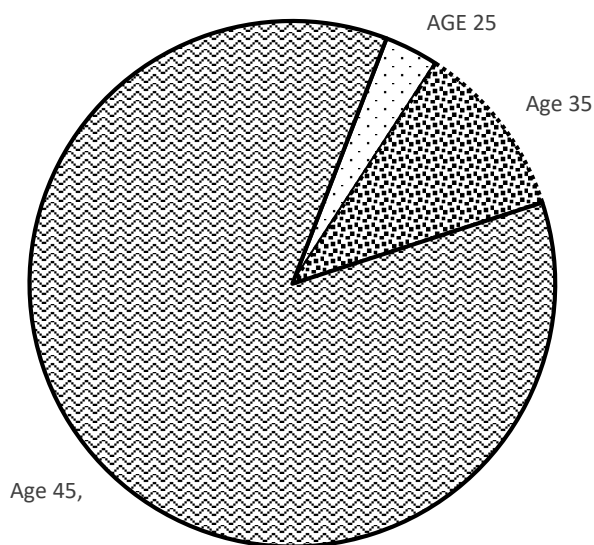
2.1	2.1.1	(a) 15 ✓ chromosomes		(1)
		(b) 50 ✓ chromosomes		(1)
	2.1.2	40 x 2 ✓ = 80 ✓ chromatids.		(2)
	2.1.3	-Crossing over ✓ -Random arrangement of chromosomes or chromatids along the equator ✓		
		<b>(Mark the First One only)</b>		(1)
				<b>(5)</b>
2.2	2.2.1	As the age of the mother increases ✓ chances of having a Downs syndrome baby increases ✓		(2)
	2.2.2	3 times ✓		(1)



2.2.3



Age of the mother on the risk of having a Down syndrome babies( per 10000 births)



Calculations

Age 25  $8/233 \times 360^{\circ} = 12^{\circ}$

Age 35  $25/233 \times 360^{\circ} = 39^{\circ}$

Age 45  $200/233 \times 360^{\circ} = 309^{\circ}$

Criteria for marking pie-chart

Criteria	Mark allocation
Correct type of graph(T)	1
Caption (C)	1
Correct calculations (CA)	1-2 correct: 1 All calculations correct: 2
Plotting (P)	1-2 correct: 1 All slices correct: 2

(6)

2.2.4 Ovary✓

(1)

(10)

[15]

**QUESTION 3**

3. 3.1 (i) -Forms spindle fibres✓ (1)  
 (ii) -Hold chromosomes✓ (1)

3.2 Metaphase I (1)

3.3 -Chromosomes are at the equator✓ in their homologous pairs✓ (2)

- 3.4 -Crossing over✓\*  
 -Occurs during prophase 1✓  
 -Chromatids of homologous pairs overlap✓  
 -At a point called chaisma✓  
 -To exchange genetic material✓

(Any 2 + compulsory) (3)

3.5

Meiosis I	Meiosis II
-Crossing over occurs	-No crossing over
-(In metaphase) the chromosomes align on the equator in homologous pairs✓	-(In metaphase) chromosomes align singly ✓ on the equator
-Chromosome move towards the opposite poles✓	-Chromosome splits and move towards the opposite poles✓
-Chromosome number is halved✓	-No halving of chromosome number✓

**Mark the first TWO + ✓\* Table (5)**

3.6 The cell has 8 chromosomes✓  
 Human cell have 46 / 23 pairs of chromosomes✓

(2)

(15)

**TOTAL SECTION B: (30)**

**GRAND TOTAL: [50]**



**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

**LIFE SCIENCES**  
**GENETICS & INHERITANCE (2)**  
**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**



**This marking guideline consists of 5 pages.**

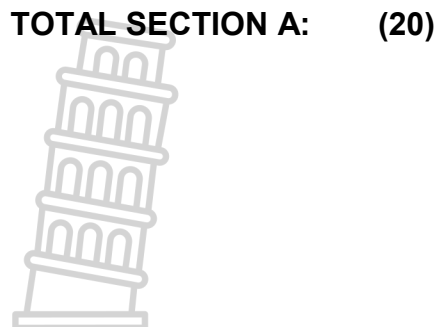
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**SECTION A**

**QUESTION 1**

1.1	1.1.1	B✓✓		
	1.1.2	D✓✓		
	1.1.3	A✓✓		
			(3x2)	<b>(6)</b>
1.2	1.2.1	Sex-linked✓		
	1.2.2	Autosomes✓		
	1.2.3	Genetic engineering✓		
	1.2.4	Multiple alleles✓		
			(4 x 1)	<b>(4)</b>
1.3	1.3.1	None✓✓		
	1.3.1	None✓✓		
			(2x2)	<b>(4)</b>
1.4	1.4.1	Pedigree✓		(1)
	1.4.2	3 / Three✓		(1)
	1.4.3	3 / Three ✓		(1)
	1.4.4	I <sup>A</sup> i ✓ I <sup>B</sup> i ✓ ii ✓		(2)
	1.4.5	ii✓		(1)
				<b>(6)</b>
			<b>TOTAL SECTION A:</b>	<b>(20)</b>



**SECTION B**  
**QUESTION 2**

- 2.1 2.1.1 - Spine✓  
- Hips✓ (2)
- 2.1.2 - A change in the sequence✓  
- of nitrogenous bases✓/nucleotides in DNA✓ (2)
- 2.1.3 - To check for the gene mutation✓  
- and if it results in the high bone density✓ (2)
- 2.1.4  $\frac{13}{20} \times 100 = 65\%$  OR  $\frac{7}{20} \times 100 = 35\%$   
 $(100 - 35) = 65\%$  (3)
- (9)**



2.2 2.2.1



P<sub>1</sub>

Phenotype With polydactyly x Without polydactyly✓  
 Genotype Rr x rr✓

Meiosis

G/gametes R, r x r, r✓

Fertilisation

Genotype Rr, Rr, rr, rr✓

Phenotype 2 polydactyly ; 2 without polydactyly✓

50✓\*% chance of polydactyl child

P<sub>1</sub> and F<sub>1</sub>✓

Meiosis and fertilisation✓

\*1 compulsory mark + Any 5

OR

P<sub>1</sub>

Phenotype With polydactyly x Without polydactyly✓  
 Genotype Rr x rr✓

Meiosis

Fertilisation

Gametes	R	r
r	Rr	rr
r	Rr	rr

1 mark for correct gametes  
 1 mark for correct genotypes

F<sub>1</sub>

Phenotype 2 polydactyly ; 2 without polydactyly✓

50✓\*% chance of polydactyl child

P<sub>1</sub> and F<sub>1</sub>✓

Meiosis and fertilisation✓

\*1 compulsory mark + Any 5

(6)

(6)

[15]

QUESTION 3

3.1 3.1.1 (a) BBDD ✓  
 bbdd ✓

(2)

3.1.2 (b) White, round fruit ✓✓

(1)

3.1.2 (a) BD, bD, Bd, bd ✓✓

(2)

(b) One / 1 ✓

(1)



3.1.3 BBdd and BBdd ✓✓

**OR**

BBdd and Bbdd ✓✓

**OR**

BBdd and bbdd ✓✓

(2)

**(9)**

3.2 3.2.1 - Embryos ✓

- Umbilical cords ✓

- Bone marrow ✓

(3)

**(Mark first THREE only)**

3.2.2 - Stem cells are undifferentiated ✓

- and have the potential to develop into any type of cell ✓

- to replace affected/ ✓defective cells causing a disorder

(2)

3.2.3 - Heart disease ✓

- Spinal injuries ✓

(1)

**(6)**

**[15]**

**TOTAL SECTION B: (30)**

**GRAND TOTAL: [50]**







**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

**LIFE SCIENCES**  
**REVISION TEST**  
**GENETICS AND INHERITANCE: 1**  
**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**



**This marking guideline consists of 5 pages.**

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**SECTION A****QUESTION 1**

1.1	1.1.1	D ✓✓		
	1.1.2	C ✓✓		
	1.1.3	B ✓✓	(3x2)	<b>(6)</b>
1.2	1.2.1	Complete dominance ✓		
	1.2.2	Alleles/Multiple alleles ✓		
	1.2.3	Sex-linked ✓		
	1.2.4	Dihybrid ✓	(4 x 1)	<b>(4)</b>
1.3	1.3.1	A only ✓✓		
	1.3.1	B only ✓✓	(2 x 2)	<b>(4)</b>
1.4	1.4.1	(a) White ✓fur		(1)
		(b) Black ✓fur		(1)
	1.4.2	(a) 1 ✓and 3 ✓		(2)
		(b) 1 ✓		(1)
		(c) 1 ✓		(1)
				<b>(6)</b>
			<b>TOTAL SECTION A:</b>	<b>20</b>

**SECTION B****QUESTION 2**

2.1	2.1.1	Purple ✓		(1)
	2.1.2	– When purple-flowering plants and white-flowering plants are crossed ✓		
		– all the offspring have purple flowers ✓ / have no white flowers		(2)
	2.1.3	– The two alleles for a characteristic ✓		
		– separate during meiosis ✓ so that		
		– each gamete contains only one allele ✓ for that characteristic		(3)

2.1.4



**P<sub>1</sub>**  
Phenotype  
Genotype

*Meiosis*

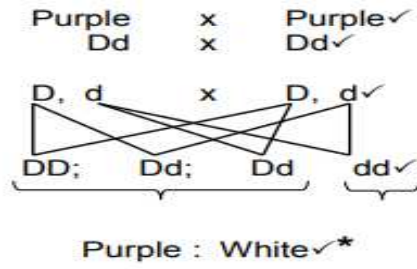
**G/gametes**

*Fertilisation*

**F<sub>1</sub>**  
Genotype

Phenotype

**P<sub>1</sub> and F<sub>1</sub>**  
Meiosis and fertilisation ✓



\*Compulsory 1 + Any 5

OR

**P<sub>1</sub>**  
Phenotype  
Genotype

*Meiosis*

*Fertilisation*

Purple Dd x Purple Dd ✓

Gametes	D	d
D	DD	Dd
d	Dd	dd

1 mark for correct gametes  
1 mark for correct genotypes

**F<sub>1</sub>**  
Phenotype

**P<sub>1</sub> and F<sub>1</sub>**  
Meiosis and fertilisation ✓

Purple: White ✓\*

\*Compulsory 1 + Any 5

(6)

(12)

- 2.2
- Females have two X-chromosomes ✓
  - one can carry the (dominant) allele for normal blood-clotting ✓ / (X<sup>H</sup>)
  - the other X-chromosome can carry the (recessive) allele for haemophilia ✓ / (X<sup>h</sup>)

(3)

[15]

**QUESTION 3**

- 3.1 3.1 To determine which blood group was the most common in their community ✓✓ (2)
- 3.2 (a) - Obtain permission from the school/clinic to conduct the investigation ✓  
- Decide on the sample size ✓  
- Decide on the method for recording results ✓  
- Decide on time/date to collect data from the clinic ✓ (3)
- (Mark the first THREE only)**



(b) - Sampled 3✓/all blood donor clinics in the community  
 - 200 donors per clinic sampled✓/600 donors (2)

(c) First time donors' blood groups are not known yet✓/ not in the database (1)

3.3  $\frac{15}{100}$  } ✓ x 600✓ = 90✓ participants (3)

3.4 (a) (Blood group) O ✓ (1)

(b) (Blood group) AB✓ (1)

3.5  $I^A I^A$  ✓  $I^A i$  ✓ (2)

[15]

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**





## KWAZULU-NATAL PROVINCE

EDUCATION  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

**LIFE SCIENCES**  
**REVISION TOPIC TEST:**  
**GENERAL EVOLUTION**  
**MARKING GUIDELINES**

**MARKS: 50**

**TIME: 60 minutes**

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**SECTION A**

**QUESTION 1**

1.1	1.1.1	B ✓✓		
	1.1.2	B ✓✓		
	1.1.3	A ✓✓		
			(3 x 2)	<b>(6)</b>
1.2	1.2.1	Punctuated equilibrium ✓		
	1.2.2	Species ✓		
	1.2.3	Extinction ✓		
	1.2.4	Inbreeding ✓		
			(4 x 1)	<b>(4)</b>
1.3	1.3.1	B only ✓✓		
	1.3.1	A only ✓✓		
			(2 x 2)	<b>(4)</b>
1.4	1.4.1	Ambulocetus ✓		(1)
	1.4.2	It had flipper-like large feet and a tail ✓ ✓		(2)
	1.4.3	- Ambulocetus ✓ - Dorudon ✓		(2)
	1.4.4	2 MYA		(1)
				<b>(6)</b>
<b>TOTAL SECTION A:</b>				<b>20</b>

**SECTION B**

**QUESTION 2**

2.1	-	Berries produce a large number of offspring ✓		
	-	There is variation ✓ in the species of berries		
	-	Green berries are poisonous and red are not ✓*		
	-	Red berries are eaten and die ✓ by herbivores		
	-	Green berries are not eaten ✓		
	-	So they survive and reproduce ✓		
	-	Passing on the allele for poison to the next generation ✓		
	-	The next generation of berries will have higher proportion of poisonous berries ✓ / green berries		
			1 Compulsory * + Any 5	<b>(6)</b>
2.2	2.2.1	Biogeography ✓		(1)





2.2.2 -Similar organisms ✓  
 -that can interbreed ✓  
 - to produce fertile offspring ✓ (3)

2.2.3 - The original population / common ancestor once lived on a large continent ✓  
 - and became separated by continental drift ✓ oceans  
 - There is no gene flow amongst the three populations ✓\*  
 - Each population was exposed to different environmental conditions ✓ / selection pressure may be different  
 - Natural selection occurred independently ✓ in each population  
 - The individuals in each population became different ✓ from each other  
 - genotypically and phenotypically ✓  
 - Even if the (three) populations were to mix again ✓  
 - They would not be able to interbreed ✓ / produce fertile offspring  
 - Forming the different species , the coyote, jackal and dingo ✓

1 Compulsory \* + Any 4 (5)

(9)  
 [15]

**QUESTION 3**

3.1 3.1. (a) The growth of egg-laying and meat-production chickens ✓ (1)

(b) Selective breeding ✓ (1)

3.2 Increase the reliability ✓  
 (Mark the first ONE only) (1)

3.3 - Same environmental conditions ✓  
 - Same type of feed ✓  
 - Same age of the chickens ✓  
 - Same number of chickens in each sample group ✓  
 (Mark the first THREE only) (3)

3.4  $2000 / 500 \times 100$  ✓  
 = 400 % ✓ (3)

3.5 - Products produced more quickly ✓  
 - Increased resistance to diseases ✓  
 - Improved quality of (chicken) products ✓  
 - Improved yield of (chicken) products ✓  
 (Mark the first TWO only) (2)

3.6 - The chickens are larger ✓ / heavier so they cannot run away from predators ✓  
 - The chickens are larger ✓ and is more visible to predators ✓  
 - Decreased variation ✓ therefore more susceptible to diseases ✓  
 (Mark the first ONE only) (2)

3.7 The chickens that underwent selective breeding for meat production grow faster than chickens bred for egg laying ✓✓

**OR**

The chickens that underwent selective breeding for egg laying grow slower than chickens bred for meat production ✓✓

**OR**

- The weight of the chickens increases with age ✓✓ /time

(2)

**(15)**

**TOTAL SECTION B: 30**

**GRAND TOTAL: 50**





**KWAZULU-NATAL PROVINCE**

**EDUCATION**  
REPUBLIC OF SOUTH AFRICA

NATIONAL

GRADE 12

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**REVISION TEST:**  
**HUMAN EVOLUTION**  
**MARKING GUIDELINES**

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**SECTION A**

**QUESTION 1**

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	1.1.2	C ✓✓		
	1.1.3	C ✓✓		
			(3x2)	<b>(6)</b>
1.2	1.2.1	Canines ✓		
	1.2.2	Hominidae ✓		
	1.2.3	Prognathous ✓		
	1.2.4	Phylogenetic tree ✓		
			(4 x 1)	<b>(4)</b>
1.3	1.3.1	B only ✓✓		
	1.3.2	Both A and B ✓✓		
			(2x2)	<b>(4)</b>
1.4	1.4.1	(a) - Sahelantropus ✓ - Australopithecus ✓ - Homo ✓ <b>(Mark first TWO only)</b>	(Any 2)	<b>(2)</b>
		(b) - Taung child ✓ - Mrs Ples ✓ - Little foot ✓ <b>(Mark first ONE only)</b>	Any 1	<b>(1)</b>
	1.4.2	Homo nenderthalensis ✓		<b>(1)</b>
	1.4.3	2,9 mya/2 000 000 years ago ✓		<b>(1)</b>
	1.4.4	650 ✓ cm <sup>3</sup>		<b>(1)</b>
				<b>(6)</b>
			<b>TOTAL SECTION A:</b>	<b>(20)</b>

**SECTION B**  
**QUESTION 2**

- 2.1 - Binocular vision ✓  
 - Eyes in front ✓  
 - Stereoscopic vision ✓  
 - Colour vision ✓  
**(Mark first THREE only)** Any 3 (3)
- 2.2 Gorilla gorilla ✓ (1)
- 2.3 - Large jaws ✓  
 - Large canines ✓ (2)
- 2.4 - More forward position of the foramen magnum ✓  
 - Allows spine to enter vertically ✓  
 - To support skull ✓ /for upright walking (3)
- 2.5 (a)- Homo sapiens has S-shaped ✓ spine  
 - Gorilla gorilla has C-shaped ✓ spine (2)
- (b) - Homo sapiens has short and wide ✓ pelvis  
 - Gorilla gorilla has long and narrow ✓ spine (2)
- 2.6 - For the attachment of strong muscles ✓  
 - to assist in eating tough/hard food ✓ (2)
- (15)**

**QUESTION 3**

- 3.1 3.1.1 H. erectus ✓ (1)
- 3.1.2  $3,2 - 2,7 ✓ = 0,5 ✓$  mya (2)
- 3.1.3 - Scrapping ✓  
 - Pounding ✓  
 - Chopping ✓  
**(Mark first ONE only)** Any 1 (1)
- 3.1.4 - H. sapiens ✓  
 - H. neanderthelansis ✓  
**(Mark first ONE only)** Any 1 (1)
- 3.1.5 - Increased brain size ✓ led to  
 - increased intelligence ✓ leading to  
 - development of complex tool ✓ (3)
- (8)**



- 3.2 3.2.1 All modern humans originated in Africa✓ and migrated to other parts of the world✓ (2)
- 3.2.2 Mitochondrial DNA✓ (1)
- 3.2.3 - Fossil Ardipithecus was found ONLY in Africa ✓  
- Fossil Australopithecus was found ONLY in Africa✓  
- Fossil Homo habilis was found ONLY in Africa✓  
- The OLDEST fossil of Homo erectus was found in Africa✓  
- The OLDEST fossil of Homo sapiens was found in Africa✓  
**(Mark first FOUR only)** Any 4 (4)
- (7)
- [15]
- TOTAL SECTION B: (30)**
- GRAND TOTAL: [50]**

