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Education and Sport Development
Department of Education and Sport Development
Departement van Onderwys en Sportontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES
JUNE 2018

MARKING GUIDELINE

MARKS: 150

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PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2018

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-recognised 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 recognisable 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 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.

19. No changes must be made to the marking memoranda without consulting the provincial internal moderator.

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SECTION A

QUESTION 1

1.1
1.1.1 B✓✓
1.1.2 C✓✓
1.1.3 B✓✓
1.1.4 A✓✓
1.1.5 A✓✓
1.1.6 B✓✓
1.1.7 A✓✓
1.1.8 C✓✓
1.1.9 A✓✓
1.1.10 D✓✓

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

1.2
1.2.1 Synapse✓
1.2.2 Chiasmata/ Chiasma✓
1.2.3 Testosterone ✓
1.2.4 Accommodation✓
1.2.5 Adrenaline ✓
1.2.6 Dihybrid ✓

(6)

1.3
1.3.1 A only✓✓
1.3.2 B only✓✓
1.3.3 A only ✓✓

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

1.4
1.4.1 DNA replication ✓ (1)

1.4.2 2- phosphate group✓ 3-Deoxy ribose sugar✓ (2)

1.4.3 For the production of mRNA ✓ during protein synthesis (1)

1.4.4 Inside the nucleus✓ (1)
(5)

1.5.1 I^A, ✓ I^B✓, i✓ (3)

1.5.2 2✓ (1)

1.5.3 An individual inherits one allele ✓ from each parent✓ (2)
(6)

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1.6	1.6.1	Individual 1- **Cc**✓	(1)
		Individual- 3- **cc** ✓	(1)
	1.6.2	Yes ✓	(1)
	1.6.3	No, ✓Males and females have an equal chance of getting the disease. ✓ No, it is an autosomal, Because the diagram shows that both chromosomes of each male have two alleles which shows that they are not sex chromosomes (gonosomes) while in a sex-linked disease only X chromosome in male sex chromosome carries an allele.	(2)
	1.6.4	-They have a 50% chance of having a child with Cystic fibrosis which is quite big. ✓ -They need to be prepared to have a child with Cystic fibrosis. ✓ -They may choose not to have a child because of the risk. ✓ (any TWO)	(2) **(7)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1.1 1- mRNA✓ 2- tRNA✓ (2)

2.1.2 A- Transcription✓ (1)

C- Translation✓ (1)

2.1.3 It will result in forming a different protein✓ with different function✓ (2)

2.1.4 UGG (1)

2.1.5
- DNA unwinds✓
- and unzip✓
- Weak hydrogen bonds break✓
- One DNA strand acts as a template✓ for forming mRNA.
- Free nucleotides according to the DNA template✓
  U binds with A and G binds with C ✓

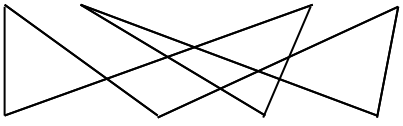
any 4 (4)

2.1.6 Polypeptide chain✓ (1)
(13)

2.2 2.2.1 Suspect 3✓ (1)

2.2.2 -The DNA fragment of S3 ✓matches the sample taken from the crime scene.✓ (2)
(3)

2.3 2.3.1

P_1/parent	phenotype	Tortoise shell Female	x	Orange male✓
	genotype	X^BX^O	x	$X^O Y$✓
	Meiosis			
	G/gametes	X^B , X^O	x	X^O , Y✓
	Fertilisation			
F_1/offspring	genotype	X^BX^O ; X^BY ; X^OX^O ; X^OY ✓		
	phenotype	**1 tortoise –shell female, 1 black male,1 orange female and1 orange male✓✓(1 mark for the correct gender and 1 mark for fur colour with correct proportion)**		

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Parents and offspring✓/P_1 and F_1
Meiosis and fertilisation✓
(Any 6+ 1) 1 Compulsory mark for the genotypes of the offspring)

OR

P_1/parent	phenotype	Tortoise shell female	x	Orange male✓
	genotype	X^BX^O	x	X^OY✓
		Meiosis		
	G/gametes	X^B, X^O	x	X^O, Y ✓

Fertilisation

Gametes	X^B	X^O
X^O	X^BX^O	X^OX^O
Y	X^BY	X^OY
Correct genotypes ✓✓		

F_1/offspring	**phenotype**	**1 tortoise-shell female,1 black male, 1 orange female and 1 orange male.** ✓✓

*

Parents and offspring✓/P_1 and F_1
Meiosis and fertilisation✓ **(Any 6+ 1 Genotype of the offspring)** (7)

2.3.2 -Because fur colour is sex linked✓. and only carried by the X Chromosome✓.
-Male kittens cannot have tortoise- shell colour because their Y chromosome does not carry any allele for fur colour. ✓. (3)

2.3.3 0%(zero percentage) ✓. (1)

2.4 2.4.1 Interneuron/ connector neuron✓. (1)

2.4.2 Motor/ efferent✓. (1)

2.4.3 -The person will become aware of the stimulus✓
- but motor neurons will not be able to transport impulses from the interneuron to the effector organ/ muscle✓
The person will not react to the stimulus. ✓ (Any 2) (2)
(4)

2.5 2.5.1 A Cerebrum✓/brain (1)

2.5.2 B- Hypothalamus✓
C-Cerebellum✓
D-Spinal cord✓ (3)

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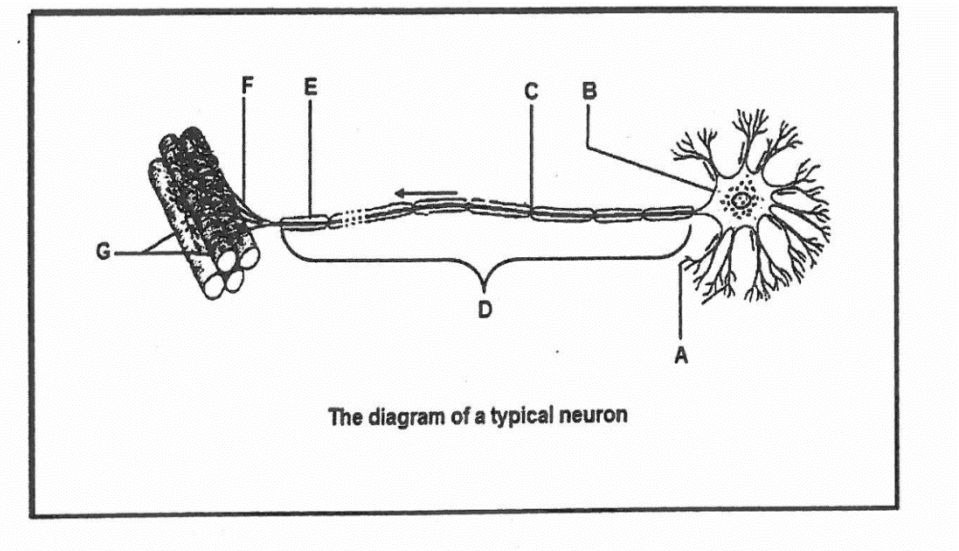
-Controls thought✓

2.5.3

-Actions✓

-Senses and movement/ All sensory actions✓ (Mark first TWO only) (2)

2.5.4



The diagram of a typical neuron

A -Dendrites✓
B- Cell body✓ (Any TWO labels (**2 Marks + 1 mark for the correct drawing/ Motor neuron)** (3)

(9)

[40]

QUESTION 3

3 3.1.1 1- Hypophysis/ Pituitary gland ✓

4-Adrenal gland✓ (2)

3.1.2 (a) Pancreas ✓

(b) Thyroid ✓ (2)

3.1.3

Hormones	Nerves
• Messages are sent to the target organs as a liquid/Hormones are sent to the target organs through blood✓	• Messages are sent to the target organs through the nerve fibres as electrical impulses✓
Responses are very slow✓	Responses are quick reactions✓

(4)

3.1.4 Goitre ✓
-Is the swelling in the neck region resulting from an enlarged thyroid gland ✓
- It is caused by the deficiency of Iodine. ✓ **(1 mark for goitre+ Any 1)** (2)
(10)

3.2 3.2.1 As the menstrual period progresses ✓ the amount of water retention increases✓.
OR
As the menstrual period progresses ✓the amount of water retained decreases ✓ . (2)

3.2.2 Menstrual period per day ✓ (1)

3.2.3 Organise volunteers to take part in the investigation✓
Select the women of the same age✓ (2)
(5)

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3.3	3.3.1	D- Testis ✓ E-Uterus G- Ovary	(3)
	3.3.2	To keep the optimal temperature for sperm production✓/ Production of sperms need a lower temperature compared to normal human body temperature.✓	(1)
	3.3.3	To transport sperms ✓	(1)
	3.3.4	F✓	(1)
			(6)
3.4	3.4.1	C✓ - D✓- A ✓	(3)
	3.4.2	-In diagram A the chromosomes have 2 chromatids ✓ each held together by the centromere -In E the daughter chromosome has only one Chromatid.✓	(2)
	3.4.3	Crossing over	(1)
			(6)
3.5	3.5.1	(i) 5 ✓ Iris ✓	(2)
		(ii)7✓- Choroid ✓	(2)
	3.5.2	The path taken by the sound waves through the human ear From the air-- auditory canal✓—tympanum-✓ malleus- incus – stapes/ ossicles✓-oval window✓-perilymph ✓of scala vestibule-endolymph ✓of scala media- Organ of Corti✓- auditory nerves-✓cerebrum✓	(9)
			(13)
			[40]
		TOTAL SECTIO B:	**80**

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SECTION C

QUESTION 4

Oogenesis(compulsory mark)✓

-The diploid ✓ germinal epithelial cells✓

-in the ovary divide by mitosis✓

-to produce diploid oogonia✓

Oogonia grow in to diploid primary oocytes.✓

Each primary oocyte divides by Meiosis I✓

-and then surrounded by a layer of cells ✓to form a diploid primary follicle✓

-each primary follicle is capable of producing a single ovum✓

-When a female reaches puberty the Pituitary gland secretes FSH✓

-which stimulates the development of a primary follicle✓

In the,primary follicle each primary oocyte completes meiosis I ✓

-and each gives rise to a larger **haploid secondary oocyte**✓

-and a smaller haploid polar body.

-The secondary oocyte is released (n) is released from the ovary during ovulation✓

-**The second meiotic division only occurs** if a sperm fertilises the secondary oocyte.✓

-During second meiotic division, the secondary oocyte (n) divides ✓

-into two daughter cells: a larger haploid ovum✓

And another polar body.✓

-sometimes the first polar body also divides to form two polar bodies.✓

-Oogenesis thus produces four haploid cells: i.e three polar bodies and a haploid ovum.✓

(1 + any 12) (13)

<u>Functions of different parts of the ovum:</u>

-The cytoplasm of the ovum is known as the yolk which provides a reserve source of nutrients ✓

-The plasma membrane which surrounds the yolk is known as the yolk membrane/ vitelline membrane✓

-which becomes impermeable after fertilisation✓

-The fertilisation membrane prevents more than one sperm to enter the ovum✓

A jelly provides protection to the early developmental stages of the

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fertilized egg.✓ (Any 4) (4)

Content (17)
Synthesis (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been sufficiently addressed
In this essay	Only information relevant to Oogenesis and functions of different parts of an ovum are given.	Information regarding the different stages of Oogenesis are arranged in the correct logical sequence.	At least **7** correct points included on oogenesis and TWO correct answers for the functions of different parts of an ovum are given.
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 150

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