education
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

SEPTEMBER 2024

MEMO

MARKS: 150

This marking guideline consists of 10 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 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
   Marks for 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 if it appears on marking guidelines.

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**
    Marking guidelines will allocate marks for units separately, except where it is given in the question.

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

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

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.

19. **Changes to the memorandum**
    No changes must be made to the marking guideline without consulting the cluster leader who in turn will consult with the curriculum implementer.

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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	D ✓✓		
	1.1.5	C ✓✓		
	1.1.6	C ✓✓		
	1.1.7	D ✓✓		
	1.1.8	A✓✓		
	1.1.9	C ✓✓		
	1.1.10	D ✓✓	10 x 2	**(20)**
1.2	1.2.1	Umbilical artery ✓		
	1.2.2	Vagina✓		
	1.2.3	Amniotic fluid ✓		
	1.2.4	Peripheral✓ nervous system		
	1.2.5	Abscisic acid✓		
	1.2.6	Anti-diuretic hormone ✓/ ADH		
	1.2.7	Sensory✓neuron		
	1.2.8	Organ of Corti ✓		
	1.2.9	Homeostasis✓		
	1.2.10	Cataracts ✓	10 x 1	**(10)**
1.3	1.3.1	None ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	B only ✓✓		
	1.3.4	Both A and B ✓✓	(4 x 2)	**(8)**
1.4	1.4.1	Ovipary✓/ Oviparous		(1)
	1.4.2	Precocial✓ development		(1)
	1.4.3	- The eyes are open✓ - Legs are well developed✓/ functional - It can feed on its own✓ - The down feathers are well developed✓/ has feathers	Any	(3)
	1.4.4	Internal ✓fertilization		(1) **(6)**
1.5	1.5.1	B - Cerebellum✓		(2)
	1.5.2	- Coordinates voluntary movement✓ - Controls balance and equilibrium✓ **(Mark first TWO only)**		(2)
	1.5.3	- Heart beat✓ - Breathing✓ **(Mark first TWO only)**	Any	(2) **(6)**
			TOTAL SECTION A:	**50**

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SECTION B
QUESTION 2

2.1 2.1.1 A- Testis✓
B- Epididymis✓
C- Vas deferens✓/Sperm duct (3)

2.1.2 - Under the influence of testosterone✓
- diploid cells✓/germinal epithelium
- in the seminiferous tubules✓of the testis
- undergo meiosis✓
- to form (haploid) sperm✓ Any (4)

2.1.3 - Tight underwear will pull the testes close to the body✓
- The temperature of the testes will be too high✓/higher pressure on the testes
- and sperm will not mature✓/sperm production is negatively affected

OR

- The testes will be away from the body✓
- The temperature of the testes will therefore be lower than body temperature✓/less pressure on the testes
- for successful sperm production✓ Any (2)

2.1.4 (a) - There will be no sperm transported through the vas deferens in the semen✓
- therefore, no fertilisation can take place✓ (2)

(b) - The fluid part of the semen will still be produced✓
- by the accessory glands✓/seminal vesicles/prostate gland/ Cowper's glands (2)
(13)

2.2 2.2.1 Day 14✓ (1)

2.2.2 - Oestrogen✓
- FSH✓ (2)

2.2.3 -The follicle develops✓ during this period stimulated by increased levels of FSH
-The lining of the endometrium thickens✓ during this period stimulated by increased levels of oestrogen (2)

2.2.4 - Corpus luteum has not disintegrated✓
- and the endometrial lining remains thickened✓ (2)

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2.2.5 - The pituitary gland✓
- secretes **LH**✓
- which causes the Graafian follicle to rupture and release the ovum✓
- This is called ovulation✓

- The empty follicle changes and becomes a corpus luteum✓
- which begins to secretes **progesterone**✓
- which causes further thickening✓
- of the endometrium✓

Any (6)
(13)

2.3 2.3.1 Allows flow of menstrual blood from the uterus to the vagina✓
Opening of uterus that seals with mucus plug during gestation✓
Widens during labour to release foetus✓ Any (1)

2.3.2 Antibiotics ✓ (1)

2.3.3 To dilate the cervix in order allow fertilisation to take place✓/ woman to fall pregnant (1)

2.3.4 - cervix will be blocked✓
- preventing sperms from moving up the uterus✓
- hence fertilisation could not take place✓

(3)
(6)

2.4 2.4.1 Cold environmental conditions✓ (1)

2.4.2 - Blood vessels dilate✓/blood vessels become wider/vasodilation occurs
- More blood flows to the surface of the skin✓
- More heat is lost from the skin✓ (3)

2.4.3 - As the environmental temperature increases above body temperature
- increased sweating will occur✓
- As the sweat is evaporated✓
- it allows the body temperature to decrease✓/more cooling of the skin will occur. Any (3)

2.4.4 $\frac{38-30}{30}$✓ x 100✓
= 26,67%✓ (accept 26,7% or 27%)

(3)
(10)

2.5 2.5.1 (a) Amount of thyroxin✓ (1)

(b) Mass of rats✓ (1)

2.5.2 - Group **1**✓
- Group **3**✓ (2)

2.5.3 - environment✓
- amount of water✓ (2)

2.5.4 - presence of thyroxin decreases the mass of rats and increases oxygen consumption✓✓

OR

- the absence of thyroxin increases the mass of rats and decreases oxygen consumption✓✓ (2)

(8)

TOTAL QUESTION 2 [50]

QUESTION 3

3.1 3.1.1 A- Glucagon✓
B- Insulin✓ (2)

3.1.2 (a) Pancreas✓ (1)

(b) Islets of Langerhans✓ (1)

3.1.3
- **Negative feedback reaction**✓
- **The glucose** concentration in the blood drops below normal✓
- The **alpha cells**/ islets **of** Langerhans/pancreas detect the drop and **secretes** glucagon✓
- In the **blood**✓
- Which **is transported to the** liver✓/muscle cells
- Glucagon stimulates the conversion of glycogen to glucose✓
- The glucose concentration in the blood returns to normal✓ (6)

(10)

3.2 3.2.1 **C**✓- Yellow spot✓/ fovea centralis (2)

3.2.2 Light has to pass through **D**, the cornea✓, **E** the pupil✓ and **B**, the lens✓ before reaching **A**, the retina.
(**The learner must give the name and letter for each structure to get the mark**.) (3)

3.2.3 **Pupillary mechanism**✓*
- Circular muscle✓ of the iris relax✓
- radial muscle✓ of the iris contract✓
- Pupil size increases✓/ dilate
- More light enters the eye✓

*1 compulsory mark + Any 6 (7)

(12)

3.3 3.3.1 (a) Cochlea✓ (1)

(b) Semi-circular canals✓ (1)

3.3.2
- The pinna directs sound waves✓
- into the auditory canal✓
- The auditory canal transmits sound waves to the tympanic membrane✓
- The tympanic membrane transmits vibrations to the ossicles✓ as vibrations
- The ossicles transmit amplified vibrations✓
- to the oval window✓
- which vibrates✓and set pressure waves in the inner ear (6)

(8)

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3.4 3.4.1 A pathway taken by an impulse from a receptor to the effector to bring about the response to a stimulus✓ (1)

3.4.2 (a) Synapse✓/Synaptic gap (1)

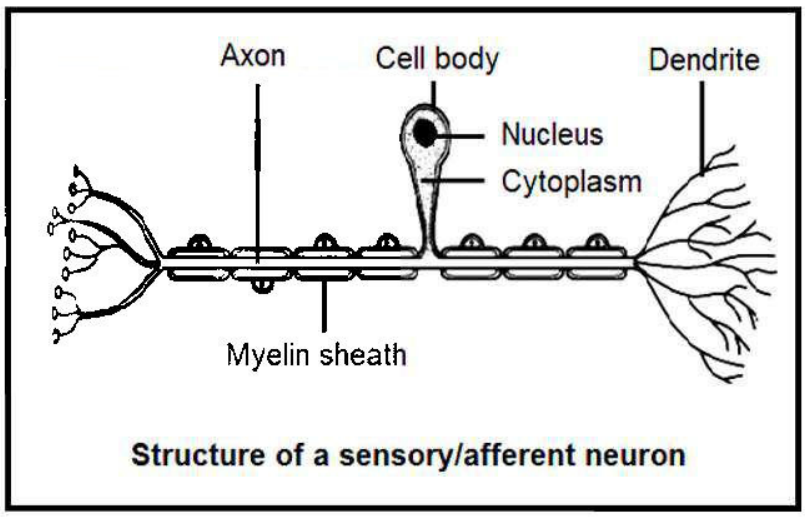
(b) Connector neuron✓/ Inter-neuron (1)

3.4.3 - It ensures that the impulse moves in one direction only✓
- It prevents continuous stimulation of the neuron✓/ filters weak or constant impulses
- able to transfer impulses to multiple neurons simultaneously✓
(**Mark first ONE only**) Any (1)

3.4.4 Sensory neuron→ Connector/ interneuron→ Motor neuron✓✓ (2)

3.4.5 - The person will be able to receive a stimulus✓
- but will not be able to respond to it✓ (2)

3.4.6



Structure of a sensory/afferent neuron

CRITERION	MARK ALLOCATION
Caption **(C)**	1
Correct diagram **(D)**	1
Any 3 correct labels **(L)**	3

(5)
(14)

3.5 3.5.1 Auxins✓ (1)

3.5.2 To cancel the effect of unilateral light on plumule growth✓/ to show that the light has no effect on the upward bending of plumule/ to exclude a phototropic response (1)

3.5.3 When a plumule is placed horizontally:

- Auxins are attracted by gravity✓
- There is a high concentration of Auxins on the lower side of the plumule✓
- Which stimulates growth/ cell elongation/ cell division on the lower side✓
- There is a low concentration of Auxins on the upper side of the plumule✓
- Which inhibits growth/ cell elongation/ cell division on the upper sides✓
- The lower side of the plumule grows faster✓/ uneven growth occurs causing the plumule to grow/ bend upwards
- The plumule grows away from gravity✓/ the plumule is negatively geotropic (3)

3.5.4 The germinating seed is attached to the disc of rotating clinostat✓ (1)

(6)

TOTAL QUESTION 3 [50]

TOTAL SECTION B: 100

GRAND TOTAL: 150

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