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# education

Department:  
Education  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**

**NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**LIFE SCIENCES P1  
SEPTEMBER 2024  
MEMO**

**MARKS: 150**

These marking guidelines consist of 10 pages.



**PRINCIPLES RELATED TO MARKING LIFE SCIENCES**

1. **If more information than marks allocated is given**  
Stop marking when maximum marks are reached and put a wavy line and 'max' in the right-hand margin.
2. **If, for example, three reasons are required and five are given**  
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If whole process is given when only a part of it is required** Read all and credit the relevant part.
4. **If comparisons are asked for but descriptions are given** Accept if the differences/similarities are clear.
5. **If tabulation is required but paragraphs are given** Candidates will lose marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required**  
Candidates will lose marks.
7. **If flow charts are given instead of descriptions** Candidates will lose marks.
8. **If sequence is muddled and links do not make sense**  
Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.
9. **Non-recognised abbreviations**  
Accept if first defined in answer. If not defined, do not credit the unrecognized 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 recognizable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**  
Accept, provided it was accepted at the National memo discussion meeting.
14. **If only the letter is asked for but only the name is given (and vice versa)** Do not credit.



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15. **If units are not given in measurements**  
Candidates will lose marks. Marking guideline 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, drawings, graphs, tables, etc.) must have a caption.
18. **Code-switching of official languages (terms and concepts)**  
A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.
19. **Changes to the marking guideline**  
No changes must be made to the marking guideline without consulting the Provincial Internal Moderator.
20. **Official marking guideline**  
Only the official marking guidelines must be used.



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

- |     |       |                                                                                                                                                                                                               |         |      |
|-----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|
| 1.1 | 1.1.1 | C✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.2 | A✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.3 | C✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.4 | D✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.5 | B✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.6 | A✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.7 | D✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.8 | B✓✓                                                                                                                                                                                                           |         |      |
|     | 1.1.9 | A✓✓                                                                                                                                                                                                           | (9 x 2) | (18) |
| 1.2 | 1.2.1 | Accommodation✓                                                                                                                                                                                                |         |      |
|     | 1.2.2 | Multiple sclerosis✓                                                                                                                                                                                           |         |      |
|     | 1.2.3 | Homeostasis✓                                                                                                                                                                                                  |         |      |
|     | 1.2.4 | Endocrine✓ gland                                                                                                                                                                                              |         |      |
|     | 1.2.5 | Osmoregulation✓                                                                                                                                                                                               |         |      |
|     | 1.2.6 | Prolactin✓                                                                                                                                                                                                    |         |      |
|     | 1.2.7 | Vasoconstriction✓                                                                                                                                                                                             |         | (7)  |
| 1.3 | 1.3.1 | B only✓✓                                                                                                                                                                                                      |         |      |
|     | 1.3.2 | B only✓✓                                                                                                                                                                                                      |         |      |
|     | 1.3.3 | None✓✓                                                                                                                                                                                                        | (3 x 2) | (6)  |
| 1.4 | 1.4.1 | F✓ - Growth hormone✓(GH)/somatotropin                                                                                                                                                                         |         | (2)  |
|     | 1.4.2 | B✓ - Pancreas✓                                                                                                                                                                                                |         | (2)  |
|     | 1.4.3 | A✓ - Ovary✓                                                                                                                                                                                                   |         | (2)  |
|     | 1.4.4 | E✓ - Thyroid gland✓                                                                                                                                                                                           |         | (2)  |
|     | 1.4.5 | C✓ - Testosterone✓                                                                                                                                                                                            |         | (2)  |
|     |       |                                                                                                                                                                                                               |         | (10) |
| 1.5 | 1.5.1 | The type of development where the young can move/walk/run/swim/eyes open/developed down/feather cover and feed/find food directly after hatching✓/ are born fully developed and are not dependent on parents. |         | (1)  |
|     | 1.5.2 | Plays a role in gaseous exchange/provides oxygen and nutrients and removes carbon di oxide and waste from the baby's blood/protection of the foetus. ✓                                                        |         | (1)  |
|     | 1.5.3 | Fish✓/mammals                                                                                                                                                                                                 | Any 1   | (1)  |
|     | 1.5.4 | A✓ - yolk ✓ (sac)                                                                                                                                                                                             |         | (2)  |
|     | 1.5.5 | Amnion✓/amniotic fluid                                                                                                                                                                                        |         | (1)  |
|     | 1.5.6 | (a) Fish✓                                                                                                                                                                                                     |         | (1)  |
|     |       | (b) Birds✓/Reptiles/Mammals                                                                                                                                                                                   | Any 1   | (1)  |
|     |       | (c) Mammals✓                                                                                                                                                                                                  |         | (1)  |
|     |       |                                                                                                                                                                                                               |         | (9)  |



**TOTAL SECTION A: 50 SECTION B****QUESTION 2**

2.1

2.1.1 (a) A - Iris✓

Controls the size of the pupil✓/amount of light entering the eye (2)

**DO NOT ACCEPT:** gives the eye colour.

(b) E - Optic nerve✓

Carries impulses to the cerebrum✓ (2)

2.1.2 **Prescription** lenses✓(glasses or contact lenses)/laser

Surgery (treatment) /cornea transplant (1)

**2.1.3 FLOWS DIAGRAM SHOULD NOT BE CREDITED.**

- The circular muscles (of the iris) contract✓
  - The radial muscles relax✓
  - The pupil constricts✓
  - The amount of light entering the eye is decreased✓/less light enters the eye (4)
- (9)**

2.2

2.2.1 (a) Implantation✓ (1)

(b) Gestation ✓ (1)

2.2.2 **ONLY CREDIT WHEN THE SEQUENCE IS CORRECT, WHERE IT GETS MUDDLED UP, DO NOT CREDIT. PRINCIPLE 8.**

- The zygote undergoes mitosis✓
- to form ball of cells✓/morula
- which develops into a hollow ball of cells✓/blastocyst/blastula (3)

2.2.3 **The embryo/foetus:**

- will not be protected from shock and (mechanical injuries)✓/can get injured easily.
- will not be hydrated✓/can dehydrate.
- will not be kept within a small temperature range/No thermoregulation✓/ can overheat/ get too cold.
- will not move freely for growth and development✓/can under-develop muscles. (4)



2.2.4

**STRUCTURE ✓ SHOULD BE LINKED TO A FUNCTION ✓**

- **Gaseous exchange** ✓: the umbilical vein ✓ carries oxygen ✓ to the foetus ✓
- OR**
- **Gaseous exchange** ✓: the umbilical artery ✓ carries carbon dioxide ✓ away from the foetus ✓
- OR**
- **Nutrition** ✓: the umbilical vein ✓ carries nutrients ✓ to the foetus.
- OR**
- **Waste removal** ✓: the umbilical artery ✓ carries nitrogenous waste ✓ away from the foetus ✓

Any (2 x 2) (4)

(13)

2.3

2.3.1 Urethra ✓ (1)

2.3.2 (a) Testes/seminiferous tubules. ✓ (1)

(b) Epididymis ✓ (1)

(c) Vas deferens/Sperm duct ✓ (1)

2.3.3 **If the scrotum/part G is exposed to high temperature:**

- It will **reduce** the production of sperms/**fewer sperm cells will be produced** ✓ /spermatogenesis
- in the **testes** ✓
- causing them to be **unhealthy** ✓ /**denatured** / poor quality/weak
- making the person **infertile** /sterile ✓

(4)



2.3.4

T✓

| Oogenesis                                                        | Spermatogenesis                                                               |
|------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Takes place in the ovary✓                                        | Takes place in the testes/ <b>seminiferous tubules</b> ✓                      |
| Begins before birth✓/during foetal development                   | Begins at puberty✓                                                            |
| One functional ovum✓ (and 3 polar bodies)/ <b>1 haploid</b> only | Four functional sperm cells/ <b>4 haploid</b> sperm cells✓ ( <b>numbers</b> ) |
| No continuous production after a certain age✓                    | <b>Continuous</b> production throughout reproductive life✓                    |
| <b>Occurs under the influence of testosterone</b> ✓              | Occurs under the <b>influence of FSH</b>                                      |

(Mark first TWO only)

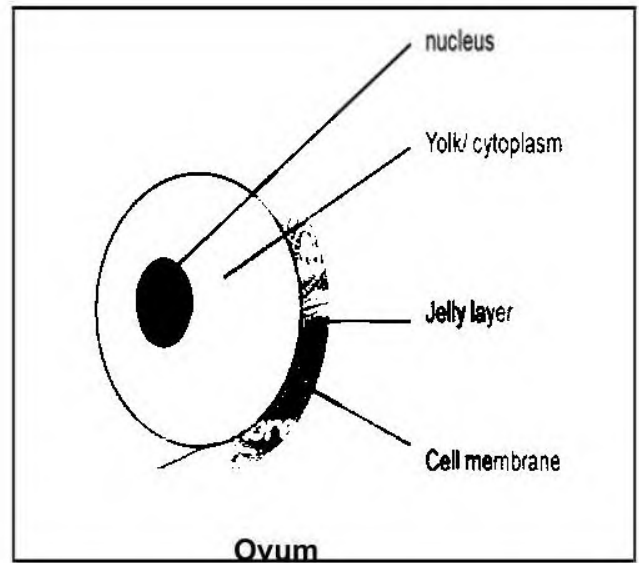
Any (2 x 2) + 1 for table (5)

**Do not accept**

Only sperm cells are formed, and an ovum is formed.



NW/September 2024



2.3.5

Criteria for marking:

| Criteria                  | Mark allocation |
|---------------------------|-----------------|
| Caption (C)               | 1               |
| Correct diagram drawn (D) | 1               |
| Any 2 labels (L)          | 2               |

Do not credit C and D if a learner has drawn a sperm fusing with an egg.

(4)  
(17)

2.4

- 2.4.1 (a) Day 14✓/day 15 (1)  
(b) Days 0-6✓/0-7 (1)
- 2.4.2 The endometrium✓, breakdown/sheds off✓
- 2.4.3 To maintain the thickness of the endometrium(cause)✓/keep it vascular and glandular for implantation (not pregnancy) (effect)✓ (2)
- 2.4.4 As the level of oestrogen increases✓, the thickness of the endometrium increases✓ (2)

**NB: relationship should be stated in the correct order and if the function is provided it should not be credited.**



2.4.5 (a) No✓ (1)

- (b) - corpus luteum started to degenerate✓ causing a decrease in progesterone levels✓

**OR**

- progesterone levels have decreased✓ causing the endometrium to break down✓/leading to menstruation

**OR**

- progesterone levels have decreased✓ stimulating the secretion of FSH✓/FSH starts to increase

**OR**

- FSH levels starts to increase✓ stimulating the development of a new follicle✓/ Graafian follicle starts to form

Any (1 x 2)

(2)

(11)

[50]



**QUESTION 3**

- 3.1 3.1.1 To determine the effect of abscisic acid on plant dormancy✓ (1)
- 3.1.2 (a) Abscisic acid✓ (do not credit "the effect of") (1)
- (b) Plant dormancy✓ (1)
- (c) - Constant temperature of 28 °C✓, not temperature only  
 - Constant humidity of 30 %✓, not humidity only  
 - Pear trees of the same age/size✓/species of pear tree  
 - 8 pear trees in each group✓  
 - Treatment period of five days✓ not treatment period only  
 - Observation period of seven days✓ not observation period only  
 Any 1 (1)
- 3.1.3 Falling of leaves/fruits from the tree✓ (1)
- 3.1.4 - brings about/promotes dormancy of seeds✓/plants  
 - helps in the closing of stomata during drought✓/water shortage  
 - promotes the ageing of leaves✓  
 - induces flowering in some plants✓ Any 2 (2)  
 (Mark first TWO only)
- 3.1.5 Learners could have: PLEASE CHECK THE TENSE
- used more than eight trees✓ (Do not credit "more trees/increased sample size)  
 - recorded results for more than seven days✓  
 - repeated the investigation✓ Any 2 (2)  
 (Mark first TWO only)
- 3.1.6 Enzymes will denature✓ causing early shedding✓/death of leaves (2)  
 (11)
- 3.2 3.2.1 B - Cerebellum✓ (1)  
 Coordination of voluntary movements✓/control of muscle tone to maintain balance/body posture (1)
- 3.2.2 Cerebrum✓/Part A (1)
- 3.2.3 Medulla oblongata ✓ (1)



3.2.4 **Changes in the direction and speed of movement:**

- causes the endolymph in the semi-circular canals to move✓
- the cristae (found in the ampulla) are stimulated✓
- and converts the stimulus into an impulse✓
- which is transmitted via the auditory nerve✓/vestibular nerve
- to the cerebellum✓
- from which impulses are transmitted via motor neurons✓
- to the effector✓/voluntary muscles/ skeletal muscles
- to maintain/restore balance (**do no credit, this is in the question**).

Any 6 (6)  
(10)

3.3 3.3.1 A - ossicles✓ (1)  
F - auditory canal✓ (1)

3.3.2 D - Eustachian tube✓ (1)  
Equalizes pressure on either side of the tympanic membrane✓/  
eardrum (1)

3.3.3 G ⇒ F ⇒ E ⇒ A ⇒ C ⇒ B✓✓ (**2 marks or nothing**). (2)

3.3.4 - Sound waves strike the tympanic membrane✓/eardrum  
- causing it to vibrate✓  
- transferring vibrations to ossicles✓ Any 2 (2)

3.3.5  
• - Pressure waves will not be generated✓in the cochlea  
- The organ of Corti will not be stimulated✓  
- Pressure waves will not be generated✓in the cochlea  
- No stimulus will be converted to an impulse✓  
- Impulse will not be interpreted in the cerebrum✓  
- and the sound will be distorted✓\* /will be unclear (**COMPULSORY MARK**)  
- causing less✓/no hearing Any 3 + 1 compulsory\* (4)  
(12)

3.4 3.4.1 **Vasodilation involves:**

- The **relaxation of** (smooth) **muscles in blood vessels**✓
- leading to an increase in their diameter (**becomes wider**)✓
- this facilitates increased blood flow to the skin/**more blood flows to the surface of the skin**✓
- promoting heat loss✓/radiation (4)



- |       |                                                                                          |                                                                                                                                                                                                                                                                                                                                                           |                  |
|-------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 3.4.2 | Sweating - excess heat is absorbed by water/sweat/fluid✓, causing to evaporation✓        |                                                                                                                                                                                                                                                                                                                                                           |                  |
|       | Vasodilation - excess heat leaves the skin surface✓ through radiation✓ causing cooling ✓ |                                                                                                                                                                                                                                                                                                                                                           | Any 3 (3)<br>(7) |
| 3.5   | 3.5.1                                                                                    | A complex brain structure embedded deep into the temporal lobe✓                                                                                                                                                                                                                                                                                           | (1)              |
|       | 3.5.2                                                                                    | (a) Cerebrum✓                                                                                                                                                                                                                                                                                                                                             | (1)              |
|       |                                                                                          | (b) Medulla oblongata✓                                                                                                                                                                                                                                                                                                                                    | (1)              |
|       | 3.5.3                                                                                    | <ul style="list-style-type: none"> <li>- blocks signals between brain cells✓/makes chemical and molecular modifications to the brain</li> <li>- decrease the brain volume /Makes neurons to shrink (cerebrum/frontal lobe)✓</li> <li>- decrease the brain volume /Makes neurons to shrink (cerebellum)✓</li> <li>- damages the liver/pancreas✓</li> </ul> |                  |
|       |                                                                                          |                                                                                                                                                                                                                                                                                                                                                           | Any 1 (1)        |

**Note:** Answers to Q 3.5.4 must link to Q 3.5.3.  
e.g. Bullet 1 in Q 3.5.4 links to bullet 1 in Q 3.5.3



- 3.5.4 - Slow reflexes✓/leading to injuries✓/danger

**OR**

- Loss of higher order functions✓/causing memory loss✓

**OR**

- Loss of muscle coordination✓/leading to loss of balance✓

**OR**

- Loss of detoxification✓/leading to accumulation of toxins✓/Loss of homeostasis of glucose✓/leading to diabetes✓/Loss of ability to digest food✓/leading to weight loss✓

Any (1 x 2) (2)

- 3.5.5 Alzheimer's✓ disease (1)

- 3.5.6 **Damage to the pancreas:**

- it will not secrete enough insulin/glucagon✓
- blood glucose level will not be controlled✓/(decreased/increased)
- causing the person to suffer from diabetes✓(mellitus)/the presence of glucose in urine

(3)  
(10)  
[50]

**TOTAL SECTION B: 100**

**GRAND TOTAL: 150**