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**PREPARATORY EXAMINATION**

**GRADE 12**

**LIFE SCIENCES P1**  
**SEPTEMBER 2022**  
**MARKING GUIDELINES**

**MARKS: 150**

**These marking guidelines consist  
of 12 pages.**

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

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

1.1	1.1.1	B✓✓	
	1.1.2	D✓✓	
	1.1.3	C✓✓	
	1.1.4	B✓✓	
	1.1.5	C✓✓	
	1.1.6	D✓✓	
	1.1.7	D✓✓	
	1.1.8	A✓✓	
	1.1.9	D✓✓	
	1.1.10	B✓✓	10 x 2 <b>(20)</b>
1.2	1.2.1	Insulin✓	
	1.2.2	Adrenal✓gland	
	1.2.3	Osmoregulation✓	
	1.2.4	Aqueous humour✓	
	1.2.5	Abscisic acid✓	
	1.2.6	Endocrine✓system	
	1.2.7	Hypothalamus✓	
	1.2.8	Hormones✓	
	1.2.9	Aldosterone✓	
	1.2.10	Pinna✓	(10 x 1) <b>(10)</b>
1.3	1.3.1	B only✓✓	
	1.3.2	None✓✓	
	1.3.3	A only✓✓	
	1.3.4	B only✓✓	(4 x 2) <b>(8)</b>
1.4	1.4.1	(a) External✓ fertilisation	(1)
		(b) Internal✓ fertilisation	(1)
	1.4.2	Ovipary✓	(1)
	1.4.3	Amniotic✓ egg	(1)
	1.4.4	- Allantois✓	(2)
		- Chorion✓	<b>(6)</b>

1.5	1.5.1	(a)	Seminal vesicle✓	(1)
		(b)	Cowper's gland✓	(1)
		(c)	Urethra✓	(1)
	1.5.2	(a)	B✓	(1)
		(b)	D✓/C	(1)
		(c)	A✓	(1)
				<b>(6)</b>

**TOTAL SECTION A: 50**

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

- 2.1 2.1.1 (a) Meiosis✓ (1)
- (b) Mitosis✓ (1)
- 2.1.2 23✓pairs/ twenty three pairs (1)
- 2.1.3 Oestrogen✓ (1)
- 2.1.4 **Spermatogenesis**✓\*  
 -Under the influence of testosterone✓  
 -diploid cells in the seminiferous tubules of the testes✓  
 -undergo meiosis✓  
 -to form haploid sperm cells✓  
**\*1 compulsory mark + 3 (4)**
- 2.1.5 (a) Morula✓ (1)
- (b) Blastula✓/ blastocyst (1)
- (c) Embryo✓ (1)
- (d) Foetus✓ (1)
- (12)**
- 2.2 2.2.1 (a) Graafian follicle✓ (1)
- (b) Ovulation✓ (1)
- 2.2.2 -It will lead to a drop in progesterone✓  
 -Which will lead to the endometrium breaking down✓ / menstruation to start  
 - the female will have a miscarriage✓/ loose the pregnancy (3)
- 2.2.3 -The hypophysis✓/pituitary gland  
 - secretes FSH✓  
 - which stimulates the development of a primary follicle✓  
 - in one of the ovaries✓  
 - Only one follicle develops to full maturity in every cycle✓  
 - into a mature Graafian follicle✓/structure **X** Any (4)

- 2.2.4 - Around day 14✓  
 - the Graafian follicle/ structure **X** is fully developed✓  
 - The mature Graafian follicle/structure **X** moves to the surface of the ovary✓  
 - forming a slight swelling✓  
 -There is a sharp increase in the concentration of LH✓  
 -The wall of the ovary ruptures✓  
 -The ovum✓/haploid secondary oocyte is released  
 - which is known as ovulation✓  
 - After ovulation the remains of the Graafian follicle✓/structure **X**  
 - developing into a mass of hollow cells the corpus luteum✓/structure **Z**  
 Any (4)  
**(13)**
- 2.3 2.3.1 - Speeds up recovery✓  
 - Enhance milk production✓  
 Any (1)
- 2.3.2 - Serves as attachment for child to mother✓  
 - Secretes progesterone ✓  
 - Allows the diffusion of nutrients from the mother to the foetus✓  
 - Allows the diffusion of nitrogenous waste from the foetus to the mother✓  
 - Allows for gaseous exchange between the mother and the foetus✓  
 - Filters harmful substances e.g: drugs, medication, certain bacteria/pathogens✓  
 - Allow antibodies to protect foetus✓  
**(Mark first THREE only)** Any (3)
- 2.3.3 Drugs/medication and other substances harmful to the foetus/baby may be retained in the placenta✓  
 This can now reach baby through breastmilk✓/ damage baby through breastmilk/ build up in mothers body  
**OR**  
 Bacteria/viruses/fungi/pathogens captured in placenta✓  
 Can cause disease/infection in both mother and baby✓  
**OR**  
 Excess nitrogenous waste still in placenta✓  
 May cause chemical imbalance/build-up of waste in mother or baby✓  
**OR**  
 High levels of progesterone in placenta✓  
 Could lead to less milk production/ hormone imbalances✓  
 Any (2)  
**(6)**



- 2.4 2.4.1 Thyroid stimulating hormone (TSH)✓ (1)
- 2.4.2 To establish homeostasis in an organism✓/ to maintain a constant internal environment (1)
- 2.4.3 - High levels of thyroxin are detected✓  
- by the pituitary gland✓  
- which leads to a decrease✓ in the secretion of TSH.  
- Thyroid activity is slowed down✓ / less thyroxin is produced.  
- Thyroxin levels drop back to normal✓ (5)
- 2.4.4 - If thyroxin levels remain low  
- the basal metabolic rate (BMR) will be low✓  
- and the person's body temperature will drop very low/ always feel cold✓  
- chronic fatigue✓  
- person may gain weight✓  
- stunted physical growth✓  
- slowed mental development✓  
- slowed sexual development✓  
- development of thick skin and tongue✓ Any (4)  
(10)

2.5 2.5.1 **Changes in body temperature during strenuous exercise**

Exercise time (min)	Body temperature (°C)
Rest/0	37
20	37,5
40	38
60	38

**Criteria to mark table**

Description	Mark allocation
Heading (H)	1
Drawing of table (T)	1
Column headings (C) (independent and dependent variables with units)	1
Data (D)	1-3 corresponding data correct = 1 All corresponding data correct = 2

- 2.5.2 The body cools down naturally by excreting sweat✓  
Which evaporates✓  
The moist towels/sheets mimics the sweat✓ and  
the wind source aids evaporation✓ Any (3)  
(8)

**TOTAL QUESTION 2 [50]**

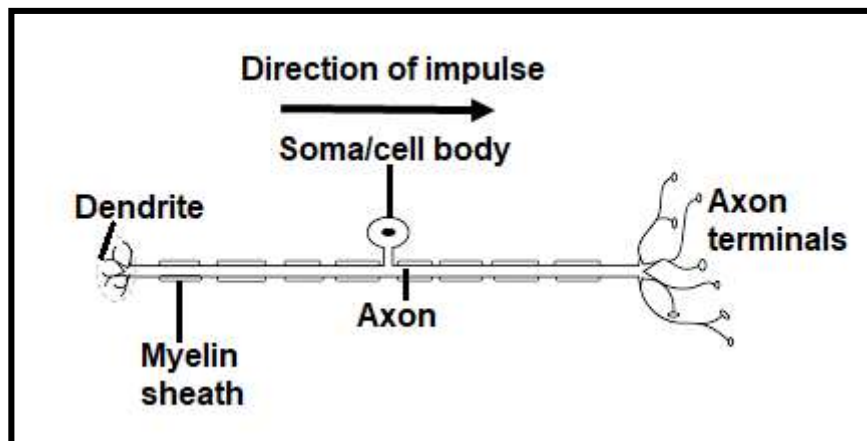
**QUESTION 3**

- 3.1 3.1.1 (a) Semi-circular canals✓ (1)
- (b) Cochlea✓ (1)
- 3.1.2 (a) C✓ (1)
- (b) B✓ (1)
- 3.1.3 - Loud sound✓/music cause a lot of vibrations in the ossicles/  
pressure waves in the cochlea✓  
- Excess vibrations are let out the round window (**E**) and the  
Eustachian tube (**D**)✓  
- The Eustachian tube links to the throat, causing you the feel these  
excess vibrations in the throat✓ Any (3)
- 3.1.4 - Change in speed and direction of head causes endolymph in  
**semi-circular canals** to move✓  
- Movement stimulates receptors: **cristae in ampulla**✓  
- Cristae converts stimuli to nerve impulses✓  
- Impulses transmitted by the vestibular and auditory nerve to  
cerebellum✓  
- **Cerebellum** sends nerve impulses to muscles to restore the  
balance✓ Any (4)
- 3.1.5 - Endolymph in the semi-circular canals keeps on moving✓  
- Receptors send message to the cerebellum that movement is still  
occurring✓  
- The brain interprets it as the child is still spinning✓/ spinning  
motion even though standing still Any (2)  
(13)

3.2	3.2.1	(a) A – Suspensory ligament✓		(1)
		(b) B – Iris✓		(1)
	3.2.2	Protects the inner parts of the eye✓		(1)
	3.2.3	- No impulse will be transmitted✓ - to the cerebrum✓ - resulting in loss of vision✓		(3)
	3.2.4	- Lens is elastic✓ Therefore can change shape✓/convexity/allow for accommodation - Lens is transparent✓ to allow light rays to pass through✓ - Lens is biconvex✓ to refract light rays✓	(Any 2×2)	(4) <b>(10)</b>
3.3	3.3.1	(a) Neuron✓		(1)
		(b) Reflex arc✓		(1)
		(c) Corpus callosum✓		(1)
	3.3.2	Positive effects on: - learning✓ - memory✓ - fine motor skills✓ - verbal reasoning✓ - non-verbal reasoning✓	Any	(1)
	3.3.3	Cerebrum✓		(1)
	3.3.4	- Ensures transmission of impulse in only ONE direction✓ - Impulses can be transmitted to more than one neuron simultaneously✓ - Filters unimportant✓/constant/weak impulses	Any	(2) <b>(7)</b>

3.4 3.4.1

**Sensory neuron**



Description	Mark allocation
Heading (H)	1
Correct diagram drawn (D)	1
Any TWO correct labels	2
Direction of impulse indicated correctly (A)	1

(5)

3.4.2 Conducts impulses from a receptor to the central nervous system✓/CNS

(1)  
(6)

3.5 3.5.1 Sympathetic✓ nervous system

(1)

- 3.5.2
- Increased heart beat✓
  - Increased breathing rate✓
  - Dilated pupils✓
  - Pale complexion✓
  - Shivering✓
  - Dry mouth✓
  - Sweating✓
  - Feeling of constantly needing to urinate✓
- (Mark first FOUR only)**

Any (4)

- 3.5.3
- Adrenalin✓
  - Adrenal gland✓

(2)

- 3.5.4
- Taking deep slow breaths✓
  - Purposefully contracting muscles and relaxing them✓

Any (1)  
(8)

3.6 3.6.1  $(120\checkmark - 80)\checkmark \text{ mm} = 40\checkmark \text{ mm}$  (3)

3.6.2 - Increase the number of plants used in each treatment✓/ group  
- Repeat the investigation✓  
**(Mark first TWO only)** (2)

3.6.3 - Fruit / flowers grow on lateral branches✓  
- Increased fruit / flower production✓ Any (1)

**(6)**

**TOTAL QUESTION 3 [50]**

**TOTAL SECTION B: 100**

**GRAND TOTAL: 150**