



**education**

Department of  
Education  
FREE STATE PROVINCE

# **PREPARATORY EXAMINATION**

**GRADE 12**

**LIFE SCIENCES P1**

**SEPTEMBER 2022**

**MARKS: 150**

**MARKING GUIDELINES**

**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 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, 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.
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 appear(s) in any official language other than the learner's 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 memoranda. The provincial internal moderator must be consulted.

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

1.1	1.1.1	D ✓✓		
	1.1.2	C ✓✓		
	1.1.3	A ✓✓		
	1.1.4	D ✓✓		
	1.1.5	D ✓✓		
	1.1.6	B ✓✓		
	1.1.7	C ✓✓		
	1.1.8	C ✓✓		
	1.1.9	C ✓✓		
	1.1.10	D ✓✓		
			(10 x 2)	<b>(20)</b>
1.2	1.2.1	Parental care ✓		
	1.2.2	Hormones ✓		
	1.2.3	Amniotic ✓ fluid		
	1.2.4	Gibberellin ✓		
	1.2.5	Acrosome ✓		
	1.2.6	Synapse ✓/synaptic cleft		
	1.2.7	Semen ✓		
	1.2.8	Menstruation ✓		
	1.2.9	Conjunctiva ✓		
			(9 x 1)	<b>(9)</b>
1.3	1.3.1	B only ✓✓		
	1.3.2	None ✓✓		
	1.3.3	B only ✓✓		
			(3 x 2)	<b>(6)</b>
1.4	1.4.1	(a) Fallopian tube ✓		(1)
		(b) Cervix ✓		(1)
	1.4.2	(a) B ✓		(1)
		(b) A ✓		(1)
	1.4.3	- Responsible for the protection of the embryo ✓ from implantation to birth		
		- provides space for the developing foetus ✓		(2)
	1.4.4	Seminal vesicles ✓		(1)
				<b>(7)</b>

- 1.5. 1.5.1 (a) Goitre ✓ (1)
- (b) A lack of iodine ✓ in the diet (1)
- 1.5.2 (a) Short-sightedness ✓/Myopia (1)
- (b) Astigmatism ✓ (1)
- 1.5.3 (The reflection of light from) an irregularly shaped cornea ✓ (1)
- 1.5.4 Deafness ✓/hearing loss/hearing impairment (1)
- 1.5.5 (a) Cataracts ✓ (1)
- (b) Middle ear infection ✓ (1)
- (8)**

**TOTAL SECTION A: 50**

## **SECTION B**

### **QUESTION 2**

- 2.1 2.1.1 - The jelly layer provides protection ✓ for the early developmental stages of the fertilised egg  
- Facilitates the movement of the ovum/embryo through the fallopian tube ✓ **(Any)** (1)
- 2.1.2 It provides the sperm with energy ✓ for locomotion. ✓ (2)
- 2.1.3 Part A is haploid ✓/has 23 chromosomes to ensure that after fertilisation the zygote has a diploid ✓ number of chromosomes/46 chromosomes. (2)
- 2.1.4 zygote → morula → blastula/blastocyst ✓✓ → foetus (2)
- (7)**
- 2.2 2.2.1 External ✓ fertilisation (1)
- 2.2.2 - The frogs are close to each other ✓  
- Many males mate with a female ✓  
- Many gametes ✓ (ova and sperm) are released **(Any)** (2)
- (Mark first TWO only)**

- 2.2.3 - Prevent dehydration ✓ of the developing tadpoles/embryos  
 - Protect the developing tadpoles/embryos from predation ✓  
 - Prevent microbial degradation ✓ and  
 - Provide a healthy environment ✓ for the embryos  
**(Mark first TWO only)** **(Any)** **(2)**  
**(5)**
- 2.3 2.3.1 The pathway along which nerve impulses are carried from a receptor to an effector to bring about a reflex action. ✓✓ **(2)**
- 2.3.2 A person would be able to feel the sensation ✓ but is unable to react ✓ to the stimuli. **(2)**
- 2.3.3 Multiple sclerosis ✓ **(1)**
- 2.4 2.4.1 Smooth muscles ✓  
 Heart ✓ muscle  
 Glands ✓ **(Any)** **(2)**  
**(Mark first TWO only)**
- 2.4.2 - Every organ/gland are controlled by two sets of nerves ✓  
 - that act antagonistically ✓  
 Autonomic nervous system is divided into  
 - Sympathetic nerves ✓ and  
 - Parasympathetic nerves ✓  
 - Sympathetic nerves stimulate ✓  
 - fight of flight function ✓ in emergency situations  
 - Parasympathetic inhibits ✓ a response and  
 - restores the body to normal ✓ **(Any)** **(5)**  
**(12)**
- 2.5 2.5.1 (a) Corpus luteum ✓ **(1)**
- (b) Placenta ✓ **(1)**
- 2.5.2 Pituitary gland ✓/Hypophysis **(1)**
- 2.5.3 - The foetus was born ✓ after 40 weeks, and  
 - milk is the only food source ✓ for the baby/milk must be produced/After birth, prolactin stimulates milk production/lactation to feed the baby **(2)**
- 2.5.4 There is no need to maintain the endometrium any longer ✓ and allows the placenta's removal/release ✓ **(2)**

- 2.5.5 - The drop in progesterone level  
 - stimulates the pituitary gland ✓/hypophysis  
 - to secrete FSH ✓  
 - The high level of FSH stimulates the development of a primary follicle ✓  
 - into a graafian follicle ✓ that  
 - leads to ovulation ✓ (5)  
**(12)**
- 2.6 2.6.1 (a) Semi-circular canals ✓ (1)  
 (b) Cochlea ✓ (1)
- 2.6.2 - The pinna directs sound waves ✓  
 - into the auditory canal ✓  
 - The auditory canal transmits sound waves to the tympanic membrane ✓  
 - The tympanic membrane transmits sound waves to the middle ear ✓/ossicles as vibrations  
 - The ossicles transmit ✓  
 - and amplify ✓ the vibrations  
 - to the oval window ✓  
 - which vibrates ✓ and transmits the vibrations to the inner ear (Any) (7)
- 2.6.3 - The auditory nerve ✓\*  
 - No impulses can be transmitted to the cerebrum ✓ and cerebellum ✓  
 - which leads to a loss of hearing ✓ and  
 - a loss of balance ✓ (\*Compulsory mark + 4) (5)  
**(14)**  
**[50]**

**QUESTION 3**

- 3.1 3.1.1 Insulin ✓ (1)
- 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 ✓ (Any) (6)  
 (9)
- 3.2 3.2.1 Umbilical cord ✓ (1)
- 3.2.2 - The umbilical arteries ✓ \*  
 - carry deoxygenated blood ✓/waste products  
 - to the placenta ✓  
 - and an umbilical vein ✓\*  
 - carries oxygenated blood ✓/nutrients  
 - from the placenta to the foetus  
 (2 \*Compulsory marks + 2 x 1) (4)  
 (5)
- 3.3 3.3.1 (a) Different light conditions ✓ (1)
- (b) Diameter of the pupil ✓ (1)
- 3.3.2 Only one person ✓ participated in the experiment/small sample size  
 The experiment was not repeated ✓/only done once (2)
- 3.3.3  $\frac{8-5}{8} \times \frac{100}{1}$  ✓  
 = 37,5 ✓% (3)
- 3.3.4 Iris ✓ (1)
- 3.3.5 Pupil mechanism ✓ (1)



- 3.3.6 Circular muscles of the iris relax ✓  
Radial muscles of the iris contract ✓  
Pupil diameter increases ✓ (3)
- 3.3.7 (a) 5 ✓mm (1)  
(b) 3 ✓ (1)  
**(14)**
- 3.4 3.4.1 A ✓ - Pituitary gland ✓/Hypophysis (2)
- 3.4.2 - No development of secondary male features ✓/Any example  
- No sperm will develop ✓/sperm count will be low (2)
- 3.4.3 - The adrenal glands are stimulated ✓  
- to secrete more aldosterone ✓  
- More sodium ions are reabsorbed ✓  
- from the distal convoluted tubules ✓/collecting ducts  
- into the surrounding blood capillaries ✓  
- Salt levels in the blood return to normal ✓ **(Any)** (4)
- 3.4.4 Water ✓  
pH ✓  
carbon dioxide ✓  
glucose ✓  
temperature ✓ **(Any)** (2)  
**(Mark first TWO only)**  
**(10)**
- 3.5 3.5.1 Auxins ✓ (1)
- 3.5.2 The growth movement of part of a plant in response to a unilateral light stimulus. ✓✓ (2)
- 3.5.3 - Auxins diffuse through the agar to the stem ✓  
- Auxins are light sensitive ✓/are destroyed by light/Auxins move away from light ✓  
- There is a higher concentration of auxins on the dark side of the stem ✓  
- Growth is stimulated ✓ on the dark side which  
- grows faster ✓  
- causing the stem to grow/bend towards the light ✓ **(Any)** (6)

- 3.5.4 - Light will not reach the tip of the stem ✓  
- Therefore, auxins are distributed evenly ✓ throughout the tip of the stem  
- The stem will grow straight up ✓/no bending towards the light
- (3)  
(12)  
[50]

**TOTAL SECTION B: 100**  
**GRAND TOTAL: 150**