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.**

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## 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.

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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.

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## 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) | **(20)** |

| | | | | |
|---|---|---|---|---|
| 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) | **(9)** |

| | | | | |
|---|---|---|---|---|
| 1.3 | 1.3.1 | B only ✓✓ | | |
| | 1.3.2 | None ✓✓ | | |
| | 1.3.3 | B only ✓✓ | | |
| | | | (3 x 2) | **(6)** |

| | | | |
|---|---|---|---|
| 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<br>- provides space for the developing foetus ✓ | (2) |
| | 1.4.4 | Seminal vesicles ✓ | (1) |
| | | | **(7)** |

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 $\left.\frac{8-5}{8}\right\}$ ✓ $\times \frac{100}{1}$ ✓

= 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**

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