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Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

LIFE SCIENCES P1

NOVEMBER 2014

MEMORANDUM

MARKS: 150

This memorandum consists of 10 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**
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If whole process is given when only part of it is required**
Read all and credit relevant part.
4. **If comparisons are asked for but descriptions are given**
Accept if 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 is incorrect, do not credit. If sequence and links becomes correct again, resume credit.
9. **Non-recognized abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.
10. **Wrong numbering**
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable. Indicate that the candidate's numbering is wrong.
11. **If language used changes the intended meaning**
Do not accept.
12. **Spelling errors**
If recognizable accept 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 name is given (and vice versa)**
No credit.
15. **If units are not given in measurements**
Memorandum will allocate marks for units separately, except where it is already given in the question.
16. Be sensitive to **the sense of an answer, which may be stated in a different way.**
17. **Caption**
Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.
18. **Code-switching of official languages (terms and concepts)**
A single word or two that appears 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 memoranda. In exceptional cases, the Provincial Internal Moderator will consult with the National Internal Moderator (and the External moderators if necessary).
20. **Official memorandum**
Only memoranda bearing the signatures of the National Internal Moderator and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.

SECTION A**QUESTION 1**

| | | | | |
|-------------------------|--------|-----------------------------------|----------|-------------|
| 1.1 | 1.1.1 | A✓✓ | | |
| | 1.1.2 | B✓✓ | | |
| | 1.1.3 | A✓✓ | | |
| | 1.1.4 | D✓✓ | | |
| | 1.1.5 | C✓✓ | | |
| | 1.1.6 | A✓✓ | | |
| | 1.1.7 | C✓✓ | | |
| | 1.1.8 | D✓✓ | | |
| | 1.1.9 | C✓✓ | | |
| | 1.1.10 | B✓✓ | (10 x 2) | (20) |
| 1.2 | 1.2.1 | Meninges✓ | | |
| | 1.2.2 | Gibberellin✓ | | |
| | 1.2.3 | Peripheral ✓ nervous system | | |
| | 1.2.4 | Parasympathetic✓ system | | |
| | 1.2.5 | Chorion✓ | | |
| | 1.2.6 | Aldosterone✓ | | |
| | 1.2.7 | Umbilical vein✓ | | |
| | 1.2.8 | TSH✓ /thyroid stimulating hormone | | |
| | 1.2.9 | Gestation✓ | | |
| | 1.2.10 | Acrosome✓ | | (10) |
| 1.3 | 1.3.1 | A only✓✓ | | |
| | 1.3.2 | B only✓✓ | | |
| | 1.3.3 | None✓✓ | | |
| | 1.3.4 | B only✓✓ | | |
| | 1.3.5 | Both A and B✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | A✓ - Iris✓ | | (2) |
| | 1.4.2 | C✓ - Choroid✓ | | (2) |
| | 1.4.3 | E✓ - Optic nerve✓ | | (2) |
| | 1.4.4 | D✓ - Fovea✓/yellow spot | | (2) |
| | 1.4.5 | B✓ - Cornea✓ | | (2) |
| | | | | (10) |
| TOTAL SECTION A: | | | | 50 |

SECTION B**QUESTION 2**

- 2.1 2.1.1 A - Urethra✓
B - Vas deferens✓/sperm duct
F - Fallopian tube✓/oviduct (3)
- 2.1.2 (a) - Protects the sperm cell against the acidic environment of the vagina✓
- Increases the motility of the sperm✓
- Provides nutrients✓
(Mark first ONE only) Any (1)
- (b) - Place for foetus to develop ✓
- Maintain pregnancy✓
- Assist in childbirth✓
- Implantation✓ of blastula
- Protects the foetus✓/prevents infections(mucus plug forms by cervix)
- Passage for sperm cells✓between vagina and fallopian tubes
(Mark first ONE only) Any (1)
- 2.1.3 (a) D✓ (1)
(b) G✓ (1)
- 2.1.4 (a) Spermatogenesis✓ (1)
(b) Oogenesis✓ (1)
- 2.1.5 - Serves as a birth canal✓
- Allows for passage of blood/ endometrial lining/amniotic fluid/placenta
- Facilitates sexual intercourse ✓/receives semen
- Secretes acid which prevents infections✓
(Mark first TWO only) Any (2)
- 2.1.6 - To keep the testes at a temperature that is lower than body temperature✓/optimum temperature for sperm production
- which is necessary for the production of healthy sperm✓/so that healthy sperms can survive (2)
(13)
- 2.2 2.2.1 FSH✓
OR
Oestrogen✓
(Mark first ONE only) Any (1)
- 2.2.2 -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
(Mark first ONE only) Any(1 x 2) (2)

- 2.2.3 - Corpus luteum has not disintegrated✓
- it continues to secrete progesterone✓
- so the endometrial lining remains thickened✓ (3)
- 2.2.4 - The zygote✓
- undergoes mitosis✓
- until a ball of cells is formed✓
- called a morula✓
- The morula continues to divide and forms a mass of cells with a hollow cavity✓
- called a blastocyst✓
- the outer membrane of the blastocyst forms chorionic villi✓/
attachment villi
- which attaches it to the endometrium✓ Any (5)
- 2.2.5 (a) For family planning✓/ to know when they can get pregnant (1)
- (b) LH✓/FSH/oestrogen
- There is a rise in levels✓ of LH/FSH/oestrogen
- around the time of ovulation✓ (3)
- 2.3 2.3.1 (a) A and B✓ (1)
- (b) A and C✓ (1)
- 2.3.2 - To ensure that the results are attributed to gravity✓
- and not light✓/ to eliminate the effect of light (2)
- 2.3.3 B – No growth will be observed✓
C – Roots will grow **horizontally**✓/not change direction (2)
- 2.3.4 - Auxins will move to the lower side of the root✓/attracted by gravity
- and a high concentration will inhibit growth on the lower side of the roots✓
- while growth will occur faster on the upper side of the root✓
- causing the root to bend downwards✓ Any (3)
- 2.3.5 - Used same type of plant✓/pea only
- Seedlings were the same age✓/germination period was 7 days
- All groups were exposed to the same environment✓/light intensity/ placed in dark cupboard
- Same number of seedlings for each group✓
- Root tips were cut at the same length✓
- All seedlings placed in same position✓/horizontally
- Allowed same amount of time for the 3 groups✓
- Appropriate controls were set up✓ Any (3)
- (Mark first THREE only)** (12)
[40]

QUESTION 3

- 3.1 3.1.1 Number of kilograms of wheat per hectare✓/Yield (1)
- 3.1.2 To compare✓the yield obtained when using two types of fertiliser with the yield of the hectare with no fertiliser✓
OR
It acts as a control✓ - to ensure that the results obtained are due to the addition of fertilisers✓ and not any other factor
Any(1x2) (2)
- 3.1.3 - She could have increased the sample size✓/number of plots/
number of plants for each type of fertiliser used
- Repeated the investigation✓
(Mark first ONE only) Any (1)
- 3.1.4 - Depletes nutrients in the soil✓
- Leads to decrease in yield✓
- Increases pests✓
- Leads to soil erosion✓
- Decreases biodiversity✓
(Mark first THREE only) Any (3)
- 3.1.5 - The excessive use of fertilisers increases the nutrient content✓of the surrounding river /eutrophication occurs/ water becomes polluted
- This causes an increase in algal growth✓ /algal bloom
- The algae block out light✓
- reducing photosynthesis✓
- Plants and animals depending on them die✓
- increasing decomposition✓
- leading to a depletion of oxygen✓
- and reducing the biodiversity✓/reducing the number of animal and plant species in the river
Any (4)
(11)
- 3.2 3.2.1 (a) - Carbon footprint is a measure of the total amount of greenhouse gas emissions✓/(example of greenhouse gas)
- of an individual✓ /defined population/ company per year (2)
- (b) - Food security refers to the availability and access✓
- to adequate, safe and nutritious food✓ to people at all times✓
Any (2)
- 3.2.2 - Energy used to produce and transport wasted food is lost✓
- The fossil fuels used in production and transport of wasted food✓
- and the decomposition of wasted food✓
- releases greenhouses gases ✓/examples of greenhouse gases
- leading to the enhanced greenhouse effect✓
which eventually leads to global warming (4)

| | | | | |
|-----|-------|--|-----|-----------------------------------|
| | 3.2.3 | <ul style="list-style-type: none"> - Buy only what is needed in sufficient quantities✓ - Give to others what is not used instead of throwing away✓ - Educate about efficient farming methods✓ - Educate about ways to preserve food✓ - Improve storage facilities✓ - Improve the shelf-life of food✓ <p>(Mark first TWO only)</p> | Any | (2) (10) |
| 3.3 | 3.3.1 | Constricted✓ | | (1) |
| | 3.3.2 | <ul style="list-style-type: none"> - Less blood flows✓ to the skin - so less heat is lost to the environment✓ by radiation - Less sweat is formed✓ because less blood flows to the sweat glands - therefore less evaporation✓ of sweat - and hence less cooling✓ of the skin - Body heat is conserved✓ | Any | (4) |
| | 3.3.3 | <ul style="list-style-type: none"> - Hypothalamus is stimulated✓ - sends message to the blood vessels of the skin to dilate✓/ vasodilation occurs - More blood flows✓ to the surface of the skin - More heat is lost by radiation✓ from the skin surface - More sweat is formed✓ because more blood flows to the sweat glands - and therefore more heat is lost by increased evaporation✓ of sweat | Any | (4) (9) |
| 3.4 | 3.4.1 | <ul style="list-style-type: none"> - The blood glucagon levels increase✓/from 100 to 210 (picograms/ml) - from 0 to 20 min✓ - and become constant✓ thereafter | | (3) |
| | 3.4.2 | <ul style="list-style-type: none"> - during exercise more energy is needed✓ - therefore the rate of cellular respiration increased✓ - Increased cellular respiration requires more glucose✓ - hence more glucagon is secreted✓ - to stimulate the conversion of glycogen to glucose✓ | Any | (3) |
| | 3.4.3 | Decrease✓ | | (1) |
| | 3.4.4 | <ul style="list-style-type: none"> - The lack of insulin✓/defective insulin - decreases the conversion✓ - of glucose to glycogen✓ | | (3) (10) [40] |

SECTION C**QUESTION 4**

As the ball moved towards the goalkeeper:

- Accommodation✓ took place
- Ciliary muscles contracted✓
- Suspensory ligaments became slack✓
- This reduced the tension on lens✓
- Lens became more convex✓/round
- Refractive power of the lens increased✓
- Image of the ball fell on the retina✓

Any (5)

Hearing

The shout of his team-mate was heard by the goal keeper as follows:

- The sound waves were directed by the pinna✓
- through the auditory canal✓
- to the tympanic membrane✓/eardrum
- causing it to vibrate✓
- The vibrations of the tympanic membrane were transferred to the ossicles✓
in the middle ear
- which eventually caused the oval window to vibrate✓
- This set up pressure waves in the cochlea✓
- This stimulated the Organ of Corti✓ in the cochlea
- to convert this stimulus into a nerve impulse✓
- which was then transmitted along the auditory nerve✓
- and interpreted in the cerebrum✓

Any (7)

Balance and equilibrium

As he dived:

- A change in the direction and speed✓ of the body
- causes the movement of fluid in the semicircular canals✓
- which stimulates the cristae✓
- A change in the position of the head✓
- stimulated the maculae✓ in the utricle and saccule
- The stimuli were converted into impulses✓
- which were transported along the auditory nerve✓
- and interpreted in the cerebellum✓
- which then sent impulses to the muscles✓
- to restore balance and equilibrium✓

Any (5)
Content (17)
Synthesis (3)

ASSESSING THE PRESENTATION OF THE ESSAY

| Relevance | Logical sequence | Comprehensive |
|---|---|---|
| All information provided is relevant to the topic | Ideas arranged in a logical/ cause-effect sequence | Answered all aspects required by the essay |
| Only information relating to accommodation, hearing and balance & equilibrium is included. (There is no irrelevant information) | Logical sequence of events in accommodation, hearing and balance & equilibrium. | Includes sufficient information on all 3 processes, i.e. accommodation(min 3/5), hearing(min 4/7) and balance & equilibrium(min 3/5) |
| 1 mark | 1 mark | 1 mark |

TOTAL SECTION C: 20
GRAND TOTAL: 150