



education

Department of
Education
FREE STATE PROVINCE

GRADE 12

**LIFE SCIENCES P2
JUNE EXAMINATION 2011
MEMORANDUM**

MARKS: 150

TIME: 2½ hours

This memorandum consists of 10 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2011

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 and 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.
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 given in terminology**
Accept provided it was accepted at the National memo discussion meeting.
14. **If only letter is asked for and only name is given (and vice versa)**
No 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 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.

SECTION A**QUESTION 1**

- | | | | | |
|-----|-------|---|---------|-------------|
| 1.1 | 1.1.1 | D✓✓ | | |
| | 1.1.2 | C✓✓ | | |
| | 1.1.3 | D✓✓ | | |
| | 1.1.4 | B✓✓ | | |
| | 1.1.5 | A✓✓ | | |
| | 1.1.6 | C✓✓ | | |
| | | | (6 x 2) | (12) |
| 1.2 | 1.2.1 | Reflex action✓ | | |
| | 1.2.2 | Tropism✓ | | |
| | 1.2.3 | Neuron✓ | | |
| | 1.2.4 | Cerebellum✓ | | |
| | 1.2.5 | Ganglion✓ | | |
| | 1.2.6 | Synapse✓ | | |
| | 1.2.7 | Choroid✓ | | |
| | 1.2.8 | Myxoedema✓ | | (8) |
| 1.3 | 1.3.1 | None✓✓ | | |
| | 1.3.2 | A only✓✓ | | |
| | 1.3.3 | Both A and B✓✓ | | |
| | 1.3.4 | A only✓✓ | | |
| | 1.3.5 | B only✓✓ | (5 x 2) | (10) |
| 1.4 | 1.4.1 | A - Hammer✓/Malleus
B - Tympanic membrane✓/Eardrum
C - Stirrup✓/Stapes | | (3) |
| | 1.4.2 | The long✓/narrow/hollow/curved tube transmits sound
Wax glands in the walls secrete wax✓/cerement which traps
foreign bodies & keeps the canal moist
Hairs✓ in the canal keep dust particles out
(Mark first TWO only) | | (2) |
| | 1.4.3 | (a) E✓
(b) F✓
(c) H✓ | | (3) |
| | 1.4.4 | - Pressure on the outside of the tympanic membrane will
increase✓ as he falls to the ground
- Air needs to enter✓ via the Eustachian tube to equalize
pressure✓ on the inside of the tympanic membrane
- Since the Eustachian tube is blocked✓the tympanic
membrane may burst✓ | Any | (3) |
| | | | | (11) |

- 1.5 1.5.1 The reaction of the normal knee reflex responses✓ will become slower✓ when people are given meprobamate✓ (3)
- 1.5.2 (a) Time in days✓/meprobamate/placebo (1)
(b) Response✓ of patellar/knee reflex (1)
- 1.5.3 Placebo (control) is something prescribed for a patient that contains no medicine✓but is given for the positive psychological effect✓it may have because the patient believes that he/she is receiving treatment (2)
- 1.5.4 - Unable to afford adequate food✓,
- clothing✓, and
- shelter✓ for themselves and their families. (2)
(Mark first TWO only) (9)

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

- 2.1**
- 2.1.1 Motor✓/Multipolar neuron (1)
- 2.1.2 A – Dendrites✓
C – Node of Ranvier✓
D – Axon✓
F – Terminal branches✓ (4)
- 2.1.3 **Dendrites (Part A)** - are short✓ and branched
- a myelin sheath is absent✓
- transmit impulses towards✓ the cell body
- Axon (Part D)**
- is long✓ and unbranched except at the terminal end
- covered by myelin sheath✓
- transmits impulses away✓ from cell body
- (Mark first TWO only)** Any (4)
(9)

- 2.2**
- 2.2.1
- The pain receptors✓ in the skin of the finger receive the pain stimulus
 - and convert the stimulus into a nerve impulse✓
 - The impulses travel along the sensory neuron✓ towards the spinal cord
 - The sensory neuron enters the spinal cord✓ along the anterior root✓ of the spinal nerve
 - In the grey matter of the spinal cord the sensory neuron makes synaptic contact with the interneuron✓
 - which in turn makes synaptic contact with the motor neuron✓
 - The impulses are then transmitted along the axon✓ of the motor neuron,
 - which leaves the spinal cord via the posterior ✓root of the spinal nerve to the effector✓/muscles to pull the finger away
- Any (6)
- 2.3**
- 2.3.1
- (a) Between 1 and 2✓
(b) Between 5 and 6✓ / 6 and 7 (2)
- 2.3.2
- (a) At measurement 4✓
(b) At measurement 8✓ (2)
- 2.3.3
- The bright light of the torch was the same✓ distance from the eye✓ (2)
- 2.3.4
- The **closer✓ the bright light** source is to the eye
– the **smaller the diameter of the pupil✓**
– **less is the light✓** allowed into the eye
– the **more protected is the sensitive retina✓** on the inside
- Any (3)
(9)
- 2.4**
- 2.4.1
- Plant B grew✓ towards the light✓/bent towards the light as it grew (2)
- 2.4.2
- The higher✓ auxin concentration on the dark side of the stem caused the cells on the dark side to elongate more✓ than the cells on the side facing the light (2)
- 2.4.3
- Plant stems/shoots grow towards light✓ and are positively phototropic✓ (2)
(6)

TOTAL QUESTION 2: [30]

QUESTION 3

- 3.1**
- 3.1.1 1- Pituitary gland✓/ hypophysis
2- Thyroid gland✓
3- Pancreas✓
4- Adrenal glands✓ (4)
- 3.1.2 - Hormones are fairly stable, chemical messengers✓
- Some hormones are proteins✓
- They stimulate or inhibit a target organ to control a wide variety of activities✓
- They are very effective and therefore needed in very small amounts✓
- They are produced by ductless glands and transported to their target organs by bloodstream✓ (3)
(Mark first THREE only)
- 3.1.3 **High thyroxin**✓ concentration in the blood will stimulate the pituitary gland✓ to secrete **less TSH**✓
The lower level of TSH will make the thyroid gland✓ to secrete **less thyroxin**✓ which will decrease✓ the level of thyroxin in the blood

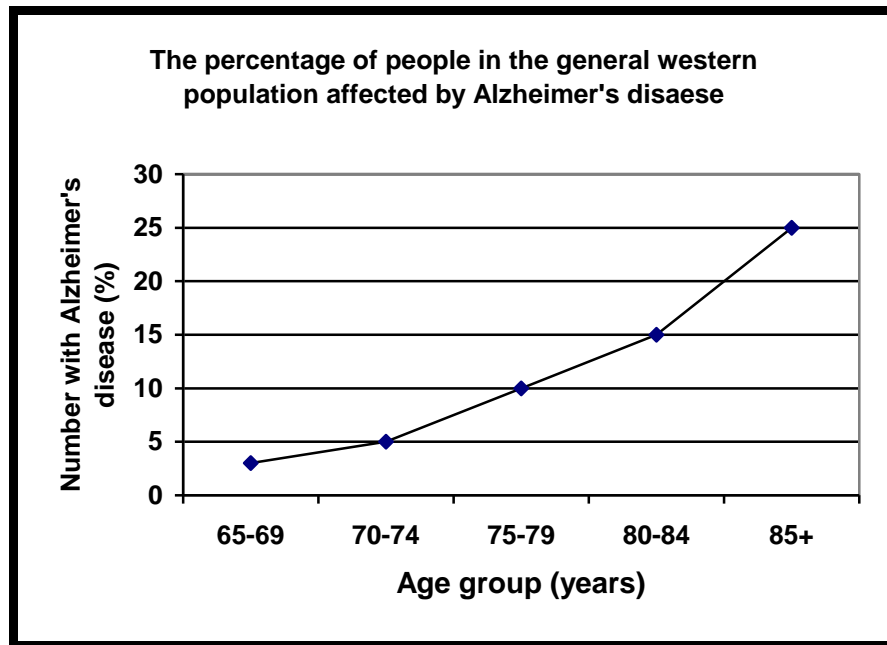
OR

- Low thyroxin**✓ concentration in the blood will stimulate the pituitary gland✓ to secrete **more TSH**✓
The higher level of TSH will make the thyroid✓ gland to secrete **more thyroxin**✓ which will increase✓ the level of thyroxin in the blood
Any (4)
- 3.1.4 It has no duct✓ to carry its secretions/secretes hormones in blood. (1)
- 3.1.5 Because insulin decreases✓ the blood glucose while glucagon increases✓ it (2)
(14)
- 3.2**
- 3.2.1 Decreased✓ (1)
- 3.2.2 Height at 14th year = 154✓ cm + 10✓ cm
=164✓ cm✓ (4)
(5)
- 3.3**
- 3.3.1 A – Cerebrum✓
B – Cerebellum✓
C – Medulla oblongata✓
D – Spinal cord✓ (4)
- 3.3.2 - Serves as a pathway✓ for nerve impulses to and from the brain
- Serves as the reflex centre✓ for certain actions (2)
(Mark first TWO only) (6)

- 3.4**
- 3.4.1 It is used to increase milk production✓/meat (1)
- 3.4.2 To prevent✓ the hormone (BST) from being digested✓ (broken down) chemically (2)
- 3.4.3
- Harmful to people’s health✓
 - Some reject it for religious reasons✓ – do not believe in genetic engineering
- (Mark first TWO only)** (2)
- (5)**
(30)
- TOTAL SECTION B: 60**

SECTION C**QUESTION 4**

- 4.1**
- 4.1.1 Number 3✓
- Image will be very clear✓
 - because light is focused on the fovea centralis✓ /yellow spot
 - which has the highest concentration of cones✓ (3)
- 4.1.2 Blind spot✓
- No image formed✓
 - because of absence of photoreceptors✓ (3)
- 4.1.3 Remains clear✓/unchanged since the eye will bring about accommodation✓ lens becomes less convex✓ to focus the light on the fovea centralis✓ /yellow spot Any (3)
- (9)**

4.2
4.2.1**Mark allocation of the graph**

Correct type of graph	1
Caption for graph	1
Correct label for X-axis including unit	1
Correct label for Y-axis including unit	1
Appropriate scale for X-axis	1
Appropriate scale for Y-axis	1
Drawing of graphs	1 – 1 to 2 points plotted correctly 2 – 3 to 4 points plotted correctly 3 – All points plotted correctly

(9)

NOTE:

If the wrong type of graph is drawn:
- Marks will be lost for 'correct type of graph'

4.2.2 As a person gets older ✓ the occurrence of Alzheimer's disease increases ✓

(2)

4.3 Possible answer**Pathway of sound waves**

- Sound waves are directed by the pinna✓ through the auditory canal✓ to the eardrum✓ causing the tympanic membrane to vibrate✓
- The vibrations of the eardrum are transferred to the ossicles✓/malleus incus, stapes of the middle ear✓
- The footplate of the stirrup causes the membrane of the oval window✓ to vibrate✓
- This sets up pressure waves in the perilymph✓ of the vestibular canal✓
- The pressure waves are transferred to the endolymph✓ of the cochlea✓ canal
- The pressure waves stimulate✓ the hair cells in the organ of Corti✓
- The hair cells convert the stimulus into an impulse✓
- The impulse is transmitted along the auditory nerve✓ to the cerebrum✓ of the brain where the sound is interpreted
- The pressure waves pass into the tympanic canal✓ where they are finally absorbed✓ by the round window✓

Any (13)

Causes of deafness

- The build-up of ear wax✓ leads to temporary deafness
- Fluid in the middle ear from infection✓ leads to temporary deafness
- Fusion of the ossicles✓
- A ruptured eardrum✓
- A damaged auditory nerve✓ or hair cells of organ of Corti due to ageing, loud sounds, noises, illness, injury, infection, etc.

(2)

(Mark first TWO only)**Treatment of deafness**

- The use of hearing aids✓ and
- Cochlear implants✓

(2)

(Mark first TWO only)**Content (17)****Synthesis (3)
(20)****[40]****GRAND TOTAL: 150****ASSESSING THE PRESENTATION OF THE ESSAY**

Marks	Description
3	Pathway of sound waves described with no irrelevant information, TWO causes and TWO treatments given.
2	Pathway of sound wave described with little irrelevant information, ONE cause and ONE treatment given.
1	Path of sound waves described with irrelevant information, ONE cause or treatment given
0	Not attempted/nothing written other than question number/no correct information