GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATION

2015

MEMORANDUM

SUBJECT: LIFE SCIENCES P1 (10831)

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION – 2015

LIFE SCIENCES
(First Paper)

MEMORANDUM

PRINCIPLES RELATED TO MARKING LIFE SCIENCES – PREPARATORY EXAMS 2015

1. **If more information than marks allocated is given**
   Stop marking when maximum mark is reached and insert 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, drawings, 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.

19. No changes must be made to the marking memoranda without consulting the subject advisors

SECTION A
QUESTION 1

1.1	1.1.1	D✓✓		
	1.1.2	C✓✓		
	1.1.3	A✓✓		
	1.1.4	B✓✓		
	1.1.5	A✓✓		
	1.1.6	B✓✓		
	1.1.7	C✓✓		
	1.1.8	D✓✓	(8 x 2)	**(16)**
1.2	1.2.1	Meninges✓		
	1.2.2	Conjunctiva✓		
	1.2.3	Hypothalamus✓		
	1.2.4	Ovum✓/egg cell		
	1.2.5	Myelin sheath✓		
	1.2.6	Gibberellins✓		
	1.2.7	LH✓/ Luteinising Hormone		
	1.2.8	Monoculture✓		**(8)**
1.3	1.3.1	Both A and B✓✓		
	1.3.2	A only✓✓		
	1.3.3	A only✓✓		
	1.3.4	Both A and B ✓✓		
	1.3.5	Both A and B ✓✓		
	1.3.6	A only✓✓		
	1.3.7	None✓✓		
	1.3.8	None✓✓	(8 x 2)	**(16)**
1.4	1.4.1	(a)- Long-sightedness✓/ Hyperopia/ Hypermetropia		(1)
		(b)- Short-sightedness✓/ Myopia/Metropia		(1)
	1.4.2	(a) C✓		(1)
		(b) F✓		(1)
		(c) B ✓		(1)
	1.4.3	(a) circular ✓		(1)
		(b) radial ✓		(1)
		(c) ciliary✓		(1)
	1.4.4	Vitreous humour✓		(1)
	1.4.5	Accommodation ✓		(1)
				(10)

TOTAL SECTION A: 50

SECTION B
QUESTION 2

2.1	2.1.1	Sweat gland✓		(1)
	2.1.2	(a) The sweat gland/ part A secretes more sweat✓ which evaporates✓ to cause cooling✓ of the body	Any 2	(2)
		(b) The blood vessels/ part B constrict✓/vasoconstriction occurs, causing less blood to flow to the skin✓. Therefore less heat flows to the skin surface.✓ Heat is conserved✓	Any 2	(2) **(5)**
2.2	2.2.1	Regulates the metabolic rate✓/the energy production Controls the normal functioning of the heart✓ Controls the normal functioning of the nervous system✓ **Mark first TWO only**	Any 2	(2)
	2.2.2	(a) Pituitary/Hypophysis ✓		(1)
		(b) TSH✓/ Thyroid Stimulating Hormone		(1)
	2.2.3	-The pituitary gland/gland X will continue✓ secreting TSH✓ /hormone A - because the signal for the pituitary gland/gland X to stop secreting✓ TSH - is when there are high levels of thyroxin✓ **OR** -Levels of hormone A✓/TSH will continue to increase -because low levels of thyroxin ✓ -stimulate gland X ✓ -to secrete more of hormone A ✓		(4) **(8)**

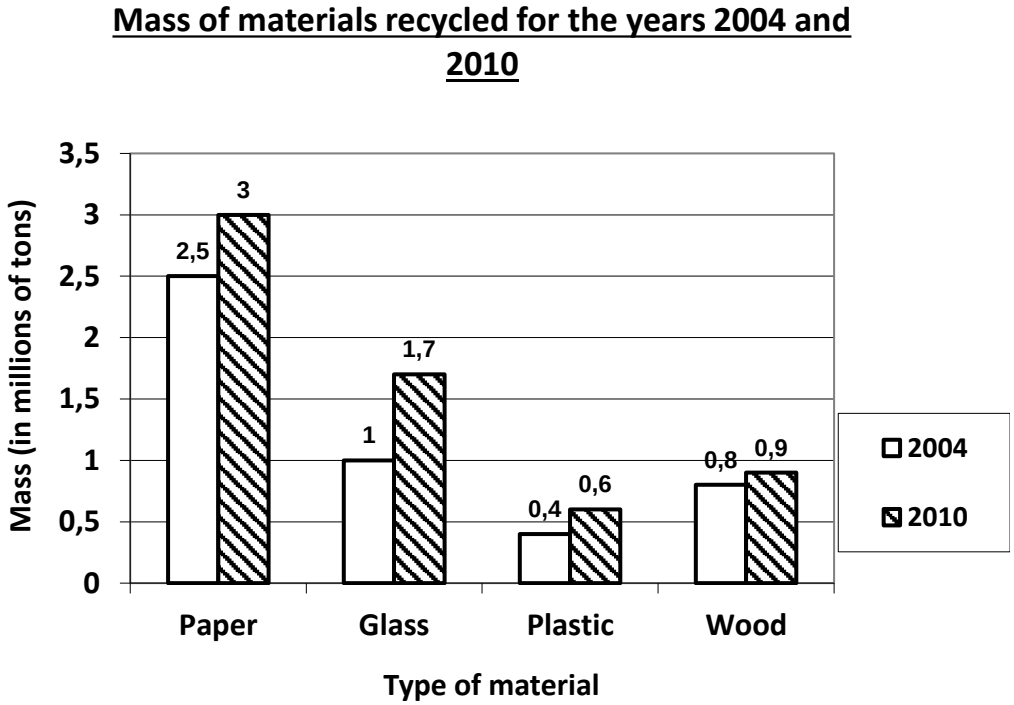
2.3	2.3.1	NPH insulin is effective for a longer/shorter period of time✓ in controlling glucose absorption levels/above 0,4 mg/kg/min✓ than LANTUS insulin **OR** LANTUS insulin is effective for a longer/shorter period of time✓ in controlling glucose absorption levels/ above 0,4 mg/kg/min ✓ than NPH insulin **Mark first ONE only** **Any 1**	(2)
	2.3.2	Diabetes✓ mellitus	(1)
	2.3.3	Health✓ /age / gender/ diet/ fitness levels/ blood glucose levels/ same amount of insulin **Mark first TWO only** **Any 2**	(2)
	2.3.4	Total/add✓ the glucose uptake for the 10 patients, then divide this value by 10✓	(2)
	2.3.5	21,5✓/ 22 hours (accept any decimal between the two)	(1)
	2.3.6	NPH✓	(1)
	2.3.7	LANTUS✓	(1)
	2.3.8	The LANTUS controls the blood glucose levels for longer ✓ periods of time	(1)
	2.3.9	Insulin increases cellular respiration✓/metabolism, thereby increasing the glucose absorption✓ by cells	(2) **(13)**

2.4	2.4.1	(a) B✓ C✓ D✓ H✓ **Mark first THREE only**	Any 3	(3)
	2.4.2	Stores sperm ✓ till maturation		(1)
	2.4.3	The secretions of gland C cause the semen to be alkaline✓/allow the sperm to survive in an acidic medium. In its absence, the sperm will become damaged/die ✓ and therefore reduce fertility **OR** The secretions of gland C causes the motility✓ of the sperm. In its absence, the sperm will not be able to travel to the ovum ✓ and therefore reduce fertility **(Mark first ONE only)**	(1 x 2)	(2)
	2.4.4	The sperm would not be transported ✓to the penis/ Semen would not have any sperm present, Without the sperm, fertilisation ✓cannot take place and therefore a pregnancy cannot occur		(2)
	2.4.5	No✓		(1)
	2.4.6	The pathogen can still be passed through the secretions of the accessory glands✓ and can be passed on during sexual intercourse		(1)
	2.4.7	The penis ✓ enters the body of the female to deposit the male gametes✓		(2)
	2.4.8	Since the gametes/embryo are contained within the body of the female✓, they are protected ✓		(2) **(14)** **[40]**

QUESTION 3

3.1	3.1.1	(a) Hammer✓/Malleus	(1)
		(b) Cochlea✓	(1)
	3.1.2	- The pinna is large✓/funnel-shaped /has grooves and ridges which - serve to trap and direct ✓the sound waves. - Auditory canal is elongated and cylindrical ✓ - to convey sound waves ✓	(4)
	3.1.3	The impulse on head position✓/direction and speed will not be conveyed to the cerebellum✓ and therefore the person's posture and balance✓ would be affected.	(2) **(8)**
3.2	3.2.1	Phototropism ✓	(1)
	3.2.2	A, ✓ D✓, and E✓	(3)
	3.2.3	These tips are exposed to the light✓, the auxins will then move to the darker side✓ causing more cell division/growth/elongation✓, thereby causing the stem to bend towards the light	(3)
	3.2.4	It acts as a control✓	(1)
	3.2.5	Auxins✓are located in the stem tips.✓ **OR** Auxins✓ cause phototropism✓	(2) **(10)**
3.3	3.3.1	By implementing better farming techniques✓ irrigation✓ the application of fertiliser. ✓ (Any 2)	(2)
	3.3.2	Drought ✓/ Erratic weather patterns (Any 1)	(1)
	3.3.3	Irrigation is costly✓/irrigation is not practised there is a lack of large river systems✓ **(Mark first ONE only)** (Any 1)	(1)
	3.3.4	Fertilisers may be washed ✓into streams/rivers etc. - resulting in excess nitrates✓/phosphates / eutrophication. - causing an algal bloom✓ - which prevents light✓ from reaching the deeper layers of the river. - This causes the plants to die ✓due to decreased photosynthesis✓. - An increase in decomposition✓ results in less oxygen ✓ in the water. - As a result the animals die as well✓. (Any 4)	(4) **(8)**

3.4 3.4.1



RUBRIC FOR THE ASSESSMENT OF THE GRAPH

Criterion	Elaboration	Mark
Correct type of graph	-Two bar graphs drawn -on one system of axes	1
Caption	Include both variables, "materials" and "years/2004 and 2010"	1
X-axis	-Correct label -Correct width and interval of bars	1
Y-axis	-Correct label and units -Correct scale	1
Key	Correct key indicating 2004 and 2010	1
Plotting of bars	1 mark: 1 to 6 bars plotted correctly 2 marks: all 8 bars plotted correctly	2
		(7)

NOTE:
-If the wrong type of graph is drawn, marks will be lost for 'correct type of graph'.
-If graphs are not drawn on the same system of axes, mark the first graph only using the given criteria

3.4.2 $\frac{3,0 - 2,5}{2,5} \times \frac{100}{1}$ ✓✓ OR $\frac{0.5}{2,5} \times \frac{100}{1}$

= 20 % ✓ (2)

3.4.3 Plastic ✓ (1)

3.4.4
- People are more conscious✓ about trying to conserve the environment ✓
- There are financial ✓ benefits to recycling, so people recycle more✓
- More material is being produced✓ and hence proportionately, more is recycled ✓

(Mark first TWO only) (Any 2 x 2) (4)

(14)

[40]

TOTAL SECTION B: 80

SECTION C
QUESTION 4

- The **endometrium lining**✓ is vascular/richly supplied with blood vessels✓
- allowing for the nourishment of the blastula✓
- The **uterine wall** ✓ serves to protect the developing embryo
- The **uterine cavity** ✓allows room for development of the foetus
- The chorion and amnion✓/**amniotic** membranes surround and thus offer protection✓ for the foetus
- The **amniotic fluid**✓serves to protect the foetus from: mechanical injury✓, temperature fluctuations✓ and dehydration✓ and
- also acts as a shock absorber ✓
- The **chorionic villi**✓ prevent the blood of the mother and that of the foetus from mixing ✓
- Which grow into the tissue of the uterus to form the **placenta**✓
- The placenta acts as a physical barrier between the mother and the foetus✓preventing the passage of most harmful substances from mother to foetus✓
- The placenta allows for the passage of nutrients and gases✓ to the foetus and removes waste products✓ from the foetus
- The placenta gives rise to the **umbilical cord**✓which
- contains an (umbilical) **artery**✓ that transports nutrients✓/ oxygen to the foetus and
- a (umbilical) **vein**✓that removes waste ✓substances from the foetus

(Any 17)

Content (17)
Synthesis (3)

ASSESSING THE PRESENTATION OF THE ESSAY (Synthesis)

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been addressed
In this essay (Q 4.1)	Only information on uterine structures and their roles in the protection and nourishment of the embryo and foetus. No irrelevant information	Each structure is linked to its appropriate function for protection and nourishment	Structures related to both protection AND nourishment are covered. At least **6** structures and their associated functions are included
Mark	1	1	1