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Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**NOVEMBER 2020**

**LIFE SCIENCES  
MARKING GUIDELINE  
(EXEMPLAR)**

**MARKS: 150**

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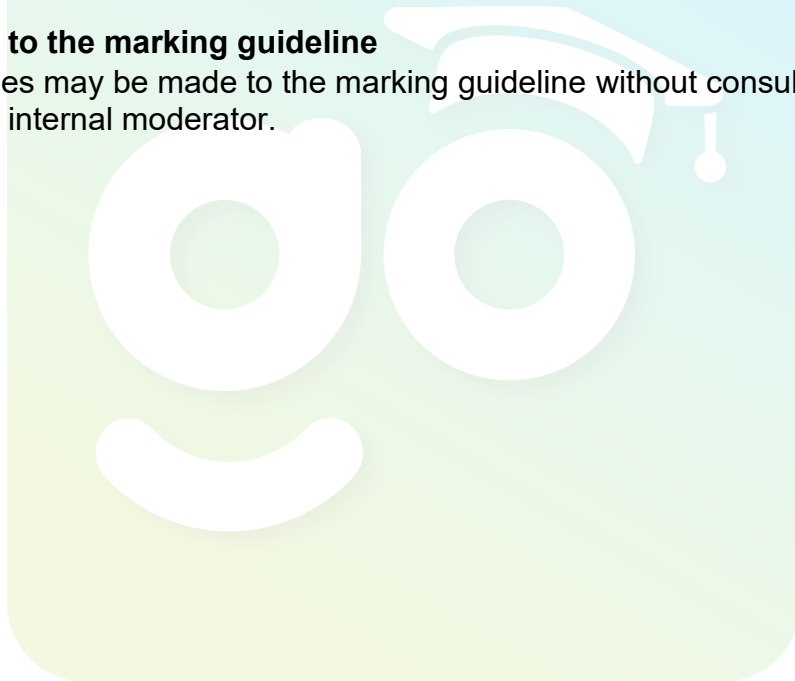
This marking guideline consists of 9 pages.

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**PRINCIPLES RELATED TO MARKING LIFE SCIENCES**

1. **If more information is given than marks allocated**  
Stop marking when maximum marks are reached and put a wavy line and write '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 provincial 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. Marking guideline 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 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 marking guideline**  
No changes may be made to the marking guideline without consulting the provincial internal moderator.



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

- 1.1 1.1.1 C ✓✓  
 1.1.2 B ✓✓  
 1.1.3 A ✓✓  
 1.1.4 C ✓✓  
 1.1.5 D ✓✓  
 1.1.6 D ✓✓  
 1.1.7 D ✓✓  
 1.1.8 A ✓✓  
 1.1.9 B ✓✓  
 1.1.10 C ✓✓ (10 x 2) (20)
- 1.2 1.2.1 Polysaccharides ✓  
 1.2.2 Iron ✓/ Fe  
 1.2.3 Cuticle ✓  
 1.2.4 Foramen magnum ✓  
 1.2.5 Group O ✓  
 1.2.6 Chemotherapy ✓  
 1.2.7 Oils ✓  
 1.2.8 Cambium ✓  
 1.2.9 Tissue ✓  
 1.2.10 Transpiration ✓ (10 x 1) (10)
- 1.3 1.3.1 Both A and B ✓✓  
 1.3.2 A only ✓✓  
 1.3.3 B only ✓✓ (3 x 2) (6)
- 1.4 1.4.1 A – joint capsule ✓ (1)  
 B – cartilage ✓ (1)  
 1.4.2 Hinge joint ✓ (1)  
 1.4.3 Fluid lubricates the bones and cartilage to prevent friction, ✓ drying out of the fluid results in painful, difficult mobility ✓/inflammation (2)  
 1.4.4 Osteoarthritis, ✓ Rheumatoid arthritis ✓ (2)
- 1.5 1.5.1 Iodine ✓ (1)  
 1.5.2 Millon's ✓/ copper sulphate (1)  
 1.5.3 Brick red ✓/ violet (1)  
 1.5.4 Fats ✓/ lipids (1)  
 1.5.5 Translucent stain on a blotting ✓/ brown/ filter paper (1)  
 1.5.6 Glucose ✓/ simple sugar/ monosaccharide (1)  
 1.5.7 Benedict's solution ✓/ Fehling's A and B (1)

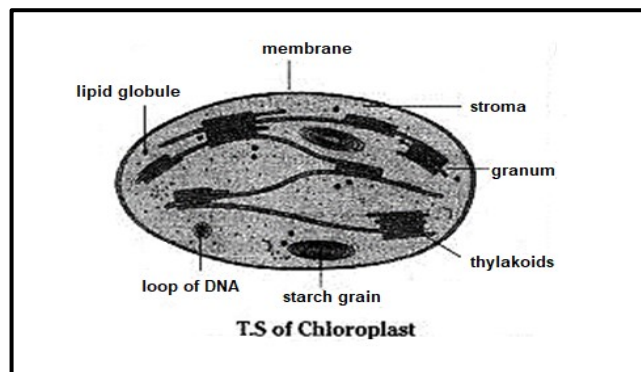
**TOTAL SECTION A: 50**

## SECTION B

## QUESTION 2

- 2.1 2.1.1 (a) An enzyme is a biological catalyst ✓ that speeds up/accelerates a chemical reaction ✓ (2)
- (b) A poisonous substance is converted into harmless substance, ✓ which prevents poisoning of body tissues ✓ (2)
- (c) Water ✓ and oxygen ✓ (2)
- (d) Enzyme remains unchanged ✓ and can be used repeatedly ✓ (2)
- 2.1.2 (a) Enzyme catalase functions optimally ✓ at body temperature of 37 °C ✓ / catalase become denatured by extremely high temperatures ✓ (90 °C) and its action will be negatively affected ✓ /catalase will be inactive ✓ at extremely low temperatures ✓ (2 °C) (2)
- (b) In test C ✓ 37 °C is the human body temperatures/optimum temperature where enzymes work best ✓ (2)
- (c) The formation of bubbles ✓ (1)
- (d) - No bubbles formed in **test tube A**, ✓ H<sub>2</sub>O<sub>2</sub> was not broken down, catalase inactive at low temperatures of 2 °C. ✓  
 - No bubbles formed in **test tube B**, ✓ H<sub>2</sub>O<sub>2</sub> was not broken down, catalase inactive at high temperatures of 90 °C ✓ (4)
- (e) Enzymes are sensitive to temperature ✓ (1)
- (f) - Same amount/size of chicken livers ✓  
 - Same amount/concentration of enzyme used ✓  
 - Chicken livers exposed to the same pH (Any TWO) (2)
- (g) To ensure reliability ✓ (1)
- 2.2 2.2.1 Organelle 1 – mitochondrion ✓ (1)  
 Organelle 2 – chloroplast ✓ (1)
- 2.2.2 Organelle 2/chloroplast ✓ (1)

2.2.3

ChloroplastMarking rubric

Caption (C) ✓

Correct diagram ✓

Any 3 correct labels ✓✓✓

(5)

2.2.4 Grana lamella ✓

(1)

2.2.5 Muscle cell, ✓ carries out process of aerobic respiration by breaking down food in the presence of oxygen resulting in cells storing energy in the form of ATP. ✓

(2)

2.2.6 Muscle cell ✓ Very active tissue ✓

(2)

2.2.7	Chloroplast/Organelle 2	Mitochondrion/Organelle 1
1.	Disc shaped ✓	1. Rod shaped ✓
2.	About 4 to 10 nm in length ✓	2. About 1,5 nm long ✓
3.	Site for photosynthesis ✓	3. Site for cellular respiration ✓
4.	Fluid called stroma ✓	4. Fluid called matrix ✓
5.	Inner projections called cristae ✓	5. Stacked lamella called grana ✓

Rubric

Table drawn ✓

(Any 3 x 2 + 1)

(7)

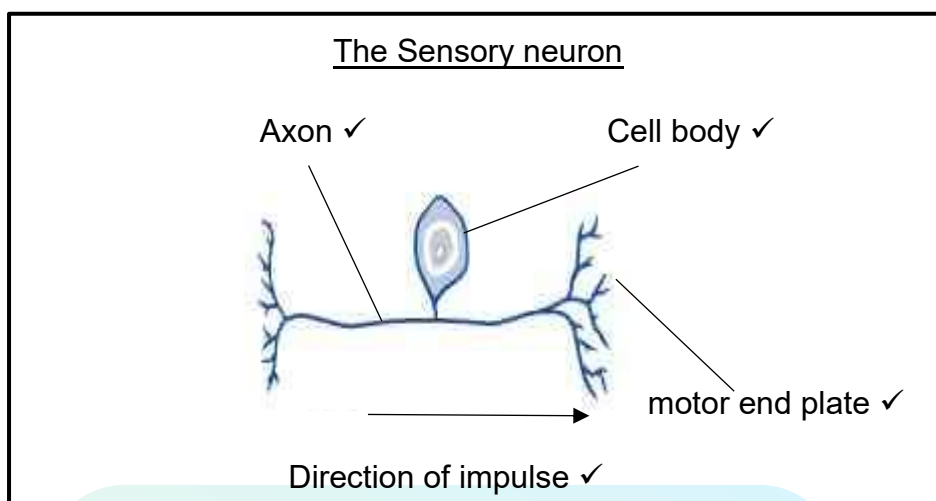
2.2.8 Actual size = Measured size (ruler)/ Magnification ✓  
 = 86 mm / 4 000 ✓  
 = 0,0215 ✓micrometres

(3)

2.3 2.3.1 Sensory ✓ / Unipolar neuron

(1)

2.3.2



Rubric

Direction of an impulse ✓

Any two correct labels ✓✓

(3)

2.3.3 (a) cell body ✓

(b) motor end plate ✓

(2)

**[50]**



**QUESTION 3**

- 3.1 3.1.1 (a) Animal proteins ✓ and fats ✓ (2)
- (b) Energy source, ✓ source of fibre, ✓ source of roughage ✓  
(Any TWO) (2)
- (c)  $18\% \checkmark - 15\% \checkmark = 3\% \checkmark$  (3)
- (d) Diet A ✓ – contains more sugar ✓ / fats/ proteins (2)
- (e) Presence of animal protein ✓ in the diet (1)
- 3.1.2 (a) Obesity refers to excessive fat deposits ✓ in the tissues and around body organs ✓ (2)
- (b) Obesity can lead to coronary heart disease ✓ / high blood pressure /diabetes/ depression/ high cholesterol which may lead to the loss of life ✓ (2)
- (c) Causes of diabetes  
 - Excessive consumption of carbohydrate rich food ✓ /high energy rich food,  
 - causing the excessive accumulation of blood glucose in the body ✓  
 - The hormone insulin fails to convert excessive glucose ✓ to glycogen ✓ and be stored in the liver.
- Treatment of diabetes  
 - Insulin dose injection ✓  
 - change in the diet ✓  
 - eating strict diet with less kilojoules ✓  
 - regular exercise ✓  
 - by reducing weight-using weight-loss programs ✓ (7)
- 3.2.1 Photosynthesis ✓ / transpiration ✓ / gaseous exchange/ guttation/ respiration  
(Any TWO) (2)
- 3.2.2 Mesophyll tissue ✓ (1)
- 3.2.3 Gaseous exchange ✓ (1)
- 3.2.4 Part A, ✓ Palisade mesophyll ✓ (2)
- 3.3 3.3.1 Hinge joint ✓ (1)
- 3.3.2 A, ✓ B ✓ and C ✓ (3)
- 3.3.3 F – metacarpal ✓  
G – ligament ✓ (2)

- 3.3.4 14 ✓ (1)
- 3.3.5 (a) biceps ✓ and triceps ✓ (2)
- (b) Proteins ✓ (1)
- (c) Muscles work antagonistically in pairs but with opposite effect to each other ✓ (1)
- (d) The person will not be able to lift the arm ✓/ to carry the heavy load (1)
- 3.4 3.4.1 Metaphase ✓ (1)
- 3.4.2 chromosomes line up at the equator ✓ (1)
- 3.4.3 A – Spindle fibre ✓ (1)  
B – Chromosome ✓/ chromatid (1)  
C – Centriole ✓ (1)
- 3.4.4 Anaphase ✓ (1)
- 3.4.5 2 ✓ chromosomes (1)
- 3.4.6 Cancer ✓ (1)
- 3.4.7 - Growth ✓  
- Replace and repair worn out cell or tissue ✓  
- Asexual reproduction ✓ (3)
- [50]**

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