



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)  |

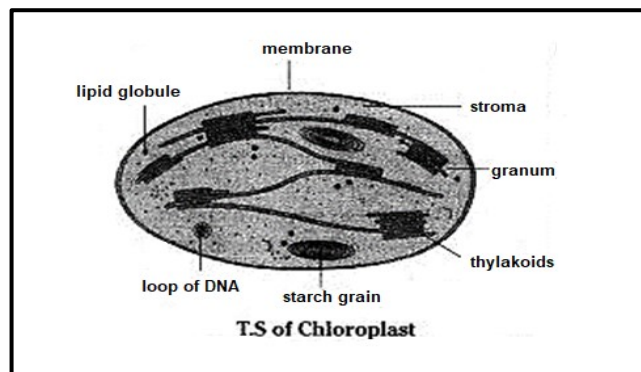
**TOTAL SECTION A: 50**

## 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 | <b>Chloroplast/Organelle 2</b>     | <b>Mitochondrion/Organelle 1</b>   |
|-------|------------------------------------|------------------------------------|
| 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)

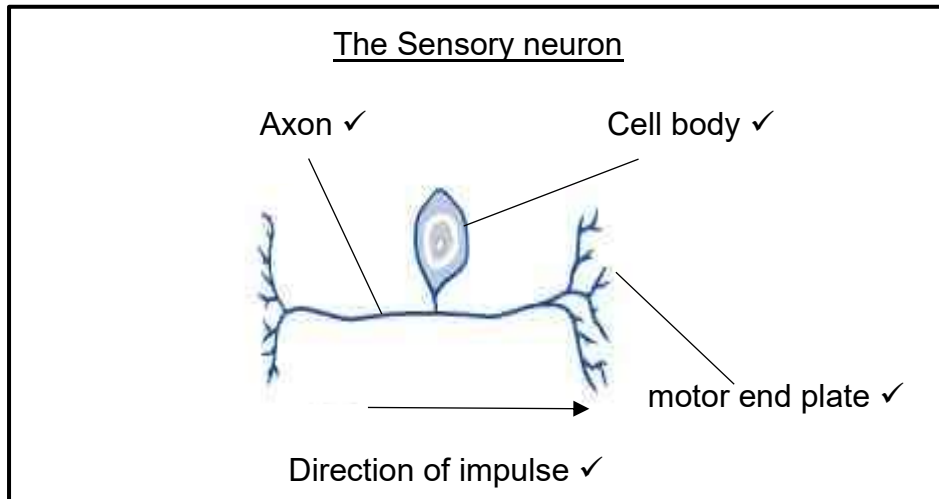
2.2.8 Actual size = Measured size (ruler)/ Magnification ✓  
 = 86 mm / 4 000 ✓  
 = 0,0215 ✓micrometres

(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)         |
|     |       |   | <b>[50]</b> |

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