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KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

FINAL

GRADE 10

LIFE SCIENCES
JUNE COMMON TEST
MARKING GUIDELINE
2024

MARKS: 150

N.B This marking guideline consist of 11 pages.

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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 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.

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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 the name is given (and vice versa)**

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 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.

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SECTION A

QUESTION 1

1.1 1.1.1 C✓✓
1.1.2 B✓✓
1.1.3 C✓✓
1.1.4 D✓✓
1.1.5 B✓✓
1.1.6 C✓✓
1.1.7 D✓✓
1.1.8 D✓✓
1.1.9 A✓✓

9x2 **(18)**

1.2 1.2.1 Septum ✓
1.2.2 Iris diaphragm/diaphragm ✓
1.2.3 Aorta ✓
1.2.4 Ribosomes ✓
1.2.5 Pulmonary veins✓
1.2.6 Valve ✓
1.2.7 Arm ✓
1.2.8 Root pressure✓
1.2.9 Active transport ✓

9x1 **(9)**

1.3 1.3.1 Both A and B ✓✓
1.3.2 A only✓✓
1.3.3 Both A and B✓✓
1.3.4 None ✓✓

4x2 **(8)**

1.4 1.4.1 (a) D✓ – Ciliated columnar epithelium✓tissue (2)
(b) B✓ - Nerve tissue/motor neuron✓ (2)
(c) A ✓- Bone tissue✓ (2)
(d) C ✓- Cartilage✓ (2)
(8)

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1.5 1.5.1 (a) X - guard cells/cytoplasm✓ (1)
(b) Y - stoma✓ (1)
(c) Z - chloroplast✓ (1)

1.5.2 Photosynthesis ✓
Gaseous exchange✓
Transpiration✓ (2)
(Mark the first TWO only)

1.5.3
- The cuticle and epidermis are transparent✓ to allow light to pass through for photosynthesis✓
- It is flattened✓ to provide large surface area ✓for maximum light absorption
- Epidermal tissue lacks organelles, thus allowing light to pass through
- There are no intercellular air spaces, increasing maximum absorption of light

(Mark the first TWO only) **Any**(1 x2) (2)
(7)

TOTAL SECTION A 50

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SECTION B

QUESTION 2

2.1 2.1.1 Carbohydrates ✓ (1)

2.1.2 Monosaccharides ✓ (1)

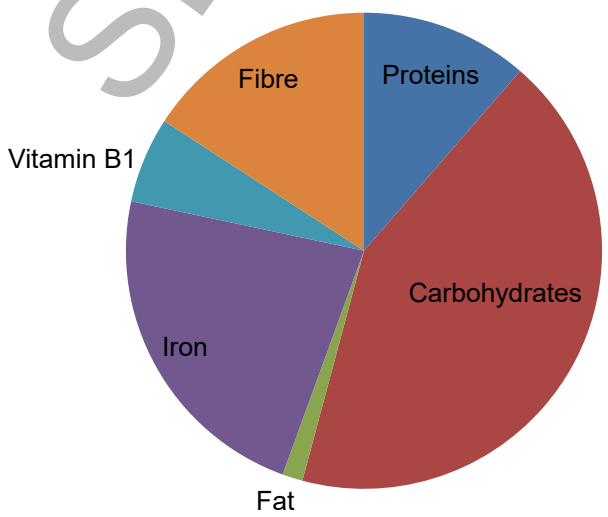
2.1.3
- Building blocks of all organic material in cells✓
- Used in the formation of enzymes which control many reactions ✓
- Hormones are proteins which control✓
- Metabolic✓activities/processes
- Reserve source of energy✓
- Required for growth and repair of body tissues✓
- Haemoglobin is a protein which plays a role in the transport of oxygen and carbon dioxide✓ (2)

(Mark the first TWO only)

2.1.4 Iron ✓ (1)

2.1.5
Proteins	= 4/ 35 x 360	= 41°
Carbohydrates	= 15/35 x 360	= 154°
Fat	= 0.5/35 x 360	= 5°
Iron	= 8/35 x360	= 82°
Vitamin B1	= 2/35 x 360	= 21°
Fibre	= 5.5/ 35 x 360	= 57°

Pie chart showing nutrients present in a box of cereal



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Criteria for marking graph:

Criteria	Mark allocation
Correct type of graph **(T)**	1
Caption (**C**)	1
Correct calculations **(CA)**	All calculations correct: 2 1-5 correct:1
Plotting **(P)**	All slices correct :2 1-5 correct:1

(6)

(11)

2.2
- Each enzyme has a particular shape✓
- The substrate fits into the enzyme✓(on which the enzyme work on)
- An enzyme – substrate complex is formed✓
- A chemical reaction occurs and the substrate is changed✓
- The enzyme and the product are then separated✓
- The enzyme is free to react with more of the substrate✓ **(5)**

2.3 2.3.1 (a) Matrix✓ (1)
(b) Stroma✓ (1)

2.3.2 Grana/grannum/thylakoids ✓ (1)

2.3.3
- Muscles require a large amount of energy✓ to function
- Therefore, many mitochondria ensure maximum energy production✓ by the cells (2)

2.3.4

Organelle A/ Mitochondrion	Organelle B/ Chloroplast
Found in both plant and animal cell ✓	Found in plant cells only✓
Site for cellular respiration✓	Site for photosynthesis✓

1 for the table + 4

(Only location and function)

(5)

2.3.5 Actual size = Measured size (ruler)/ Magnification ✓
= 86 mm / 4 000 ✓
= 0,0215✓ micrometres (3)
(13)

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2.4 2.4.1 (a) Anaphase✓ (1)

(b) Chromatid✓ (1)

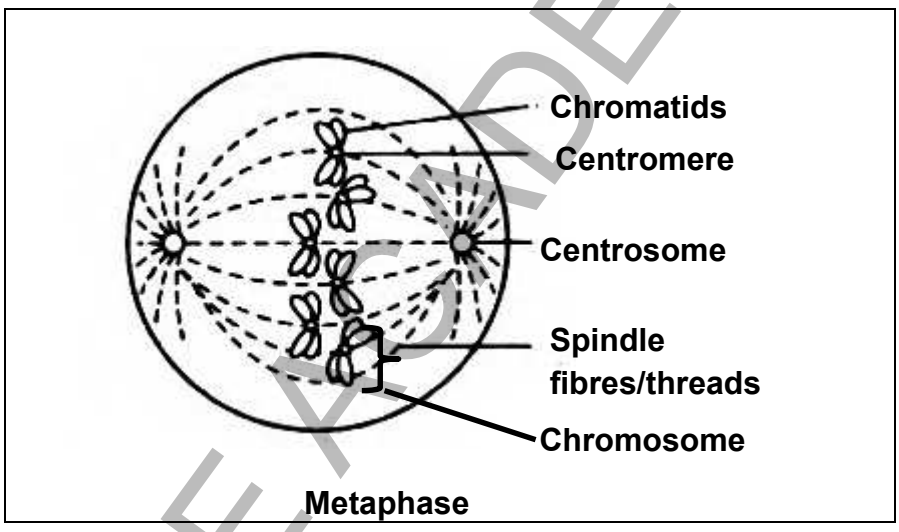
(c) A✓ (1)

2.4.2 Cancer ✓ (1)

2.4.3 6/Six ✓ (1)

2.4.4 - Part C/ spindle fibres would not be able to pull and separates chromosome✓
- There will be no chromosome/chromatids moving to each pole✓ (2)

2.4.5



Criteria for the marking the diagram:

Criteria	Mark allocation
Correct phase drawn **(P)**	1
Correct number of chromosome **(N)**	1
Caption **(C)**	1
Any correct label **(L)**	1

(4)

(11)

2.5 2.5.1 Meristematic tissue, is the tissue that is actively dividing✓ to form new cells✓ (2)

2.5.2 (a) - Healing✓
- Repair ✓ (2)

(Mark the first TWO only)

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(2)

(b) - To provide a source of meristematic cells✓
- in case the plant is attacked again✓

2.5.3 - Act as packaging tissue✓
- Stores water, sugar and starch✓ (2)
- Intercellular air spaces allow gases and water to pass through the tissue✓
(Mark the first TWO only)

(2)

2.5.4 - Bark ✓ **(10)**
- Epidermis✓ **[50]**
(Mark the first TWO only)

TOTAL QUESTION 2

QUESTION 3

3.1 3.1.1 (a) Transpiration rate✓ (1)
(b) Temperature✓ (1)

3.1.2 - Prevent the evaporation of water from the test tube✓
- so that the final reading is reliable✓ (2)

3.1.3 - Cut leafy twig under water ✓
to prevent air from getting into the xylem tissue✓
- Make a diagonal cut ✓
to increase the surface area of absorption of water/ prevent xylem from being damaged ✓
- Use twigs of the same size and species✓
because a larger twig/ different type of species will have more leaves and will have a faster rate of transpiration✓
/ will absorb the water faster (1x2) (2)
(**Mark the first ONE only)**

3.1.4
- Same species of leafy twig✓
- Same age of leafy twigs✓
- Same type of cylinder✓
- Same person taking readings✓
- Equal amount of oil✓ (2)
(Mark the first TWO only)

3.1.5 - Water in cylinder **D** will dry out✓
- Cells in the leafy twig will lose water and dry out✓

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- Leading to death of the leafy twig✓ (3)

3.1.6 - The hairs trap a thin layer of water vapour✓ close to the leaf surface.
- Leading to lower diffusion gradient✓
- resulting in less transpiration✓ (3)
(14)

3.2 3.2.1 Cambium ring / annual rings ✓ (1)

3.2.2 - Part A / epidermis is a single layer of cells✓
- That are closely packed together✓
- They are covered with waxy cuticle✓ (3)

3.2.3 Part D/phloem transport manufactured food from the leaves to all part of the plant✓ (1)
(Mark the first ONE only)

3.2.4 - The cells are elongated cells, ✓/ where the cross walls disappear to form continuous tubes for the transport of water✓
- Xylem tissue does not contain cytoplasm✓/ contains no living tissue so that the path of water is not blocked ✓by the cytoplasm
- The cellulose cell walls are strengthened with lignin, ✓ to prevent them from collapsing ✓under the strong suction pressure (4)
(Mark the first TWO only) (2 x2) **(9)**

3.3 3.3.1 (a) 24✓ (1)

(b) menopause✓ (1)

3.3.2 - As the person get older/ as age increases the bone density decreases/ become weak✓✓ (2)

3.3.3 - Exercises strengthen bone mass and make it stronger✓ / denser
- while calcium-rich food provides minerals, which build strong - bones✓, causing bone to have high density
(Mark the first TWO only) (2)

3.3.4 (a) Brain ✓ (1)

3.3.5 (b) - Movement ✓
- Support✓
- Hearing✓
- Storage of minerals✓ Any (3)
(Mark the first THREE only) **(10)**

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3.4 3.4.1 Osmosis✓ (1)

3.4.2 **Y** to **X**✓ **/** from the potato to the beaker (1)

3.4.3
- Water in the beaker has more solutes/strong sugar solution ✓
- The beaker has low water potential✓
- The water will then diffuse from the potato to the beaker where there is low water potential✓ (3)

3.4.4
- Solution in beaker has more solutes than the potato✓
- Therefore, it has low water potential✓
- The water will diffuse from the potato into the solution in the beaker✓
- The potato will therefore decrease in size✓ (4)

(9)

3.5 3.5.1 Atrial systole✓ (1)

3.5.2 0.3 seconds✓ (1)

3.5.3 (a) **Diagram A**
- Muscles of the atria contract✓
- The tricuspid and bicuspid valves open to allow blood to flow from atria into the ventricles ✓ Any (1)

(b) **Diagram B**
- Muscles of the ventricles contract✓
- Both tricuspid and bicuspid valves close✓
- Semi-lunar valves of the pulmonary artery and aorta open✓
- Deoxygenated blood from the right ventricle is forced up the pulmonary artery and moves to the lungs✓
- Oxygenated blood from the left ventricles is forced up the aorta and moves to all parts of the body ✓ Any (3)

(c) **Diagram C**
- Muscles of the atria and ventricles relax✓
- Semi-lunar valves in aorta and pulmonary artery close ✓
- Deoxygenated blood from the vena cava fills the right atrium; oxygenated blood fills the left atrium✓
- The cycle starts again Any (2)

(6)
(8)
[50]

TOTAL QUESTION 3 100
TOTAL SECTION B 150
GRAND TOTAL

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