LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

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LIFE SCIENCES
JUNE EXAMINATION 2023
MARKING GUIDELINES

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MARKS: 150

This marking guidelines consists of 17 pages including the cover page

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.

13. If common names are given in terminology
Accept, provided it was accepted at the provincial marking guideline 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



QUESTION 1

QUESTION 1

1.1.

1.1.1. B✓✓

1.1.2. B✓✓

1.1.3. B✓✓

1.1.4. A✓✓

1.1.5. D✓✓

1.1.6. C✓✓

1.1.7. B✓✓

1.1.8. A✓✓

1.1.9. C✓✓



(2×9)

1.2.

1.2.1. Pistil ✓

1.2.2. Bolus✓

1.2.3. Mesoderm✓

1.2.4. Glycolysis✓

1.2.5. Cristae✓

1.2.6. Bilateral symmetry✓

1.2.7. Cephalisation✓

1.2.8. Yeast✓

1.2.9. Vector

1.2.10. Peristalsis ✓/s

(1×10)

1.3.

1.3.1. B only✓✓

1.3.2. B only✓✓

1.3.3. NONE✓✓

1.3.4. A only✓✓

(2×4)

1.4.1. Sodium hydroxide✓/ Soda lime/ Potassium hydroxide (1)

1.4.2. Removes/ absorbs carbon dioxide in the air✓ (1)

1.4.3. The leaf turns blue-black✓ (1)

1.4.4. - As the leaf was outside the jar, it was exposed to carbon dioxide✓

- and could photosynthesize✓/ produce starch (2)

1.4.5. In the dark phase✓/ light-independent phase (1)

1.4.6. In the stroma✓ of the chloroplast (1)

1.4.7. To ensure that the starch present at the end of the investigation was produced during the investigation✓ (1)

(8)

1.5.1. (a) Oesophagus✓ (1)

(b) Cardiac sphincter✓ (1)

(c) Stomach✓ (1)

(d) Pyloric sphincter✓ (1)

1.5.2. Proteins✓ (1)

1.5.3. Protease✓ (1)

(6)

TOTAL SECTION A: 50 MARKS

SECTION B

QUESTION 2

2.1.1 Bacteria✓ need all three nutrients✓ in the culture medium for optimal growth✓.

OR

No nutrients✓ in the culture medium✓ are needed by bacteria for optimal growth✓

OR

Only nutrient A/B/C✓ is needed by the bacteria✓ for optimal growth✓ (3)

2.1.2 Number of bacterial colonies✓/ bacterial growth (1)

2.1.3 **2✓** (1)

2.1.4 Plate 2 contained all nutrients✓ (1)

2.1.5 **A✓** (1)

2.1.6 - Temperature of the culture plates✓

- The amount of oxygen available✓

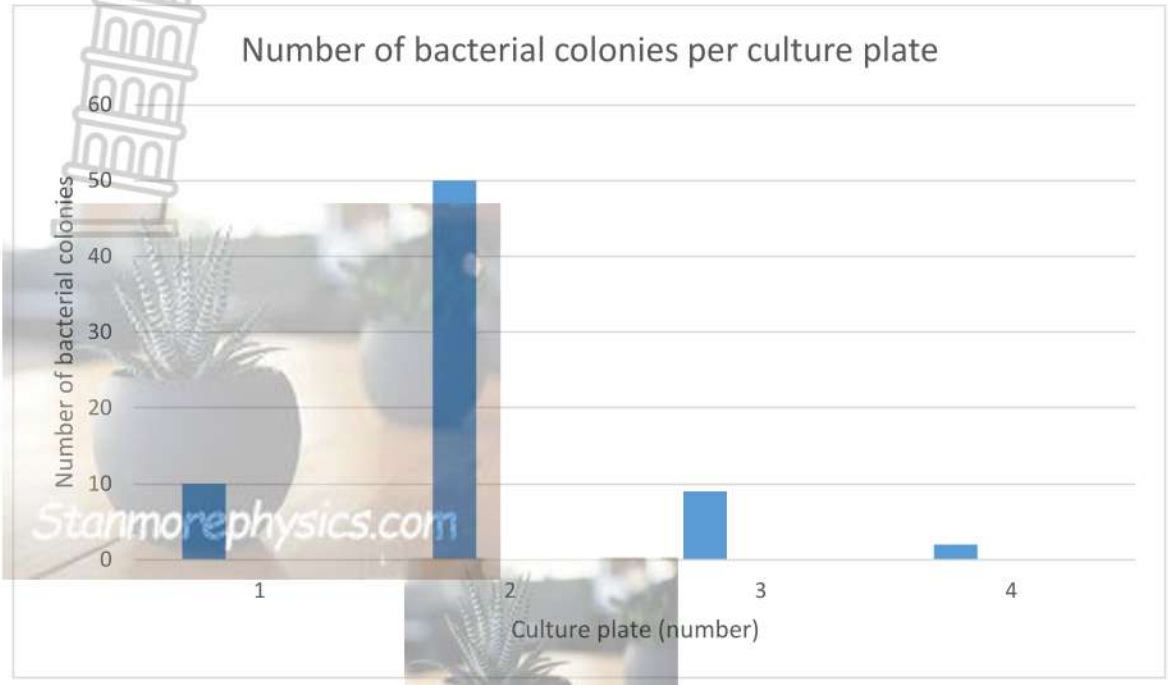
- Size of culture plate✓ **(Mark FIRST TWO)** (2)

2.1.7 - Repeat the investigation✓

- Increase the number of culture plates✓/ samples (2)

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2.1.8



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Mark allocation of the graph

Criteria	Mark Allocation
Correct type of graph drawn	1
Title of graph including the two variables (number of bacterial colonies and culture plate)	1
Correct label for X-axis and Y-axis	1
Correct scale for X-axis and Y-axis	1
Plotting of bars	0: No bars plotted correctly 1: 1 to 2 points plotted correctly 2: All 4 points plotted correctly

NOTE:

If axes are transposed: marks will be lost only for labelling of X-axis and Y-axis (6)

(17)

2.2

2.2.1 When a person with an active TB*✓ of the lungs or throat coughs/ sneezes✓, the bacterium gets into the air✓

Other people who are nearby may breathe in the bacteria✓,

it then settles in their lungs and begin to grow✓ and spread to other body parts

(1* compulsory mark + ANY 2 MARKS)

2.2.2 HIV lowers the body's immunity✓/ white blood cell count therefore it cannot defend the body against TB✓ (2)

2.2.3 A person is given a weak strain of the bacteria✓ the body will produce antibodies to fight the infection✓ The antibodies will protect them against a new/stronger infection of the same germ✓ (3)

(12)

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2.3

2.3.1 (a) Anther✓ (1)

(b) Calyx✓ (1)

(c) Flower stalk ✓ (1)

2.3.2 (a) Perianth ✓ (1)

(b) Pistel ✓ (1)

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2.3.3 - Contain and protect the reproductive organs✓

- Attract pollinators✓ (2)

2.3.4 **2✓** (1)

2.3.5

Wind pollinated flowers	**Insect pollinated flowers**
Small and inconspicuous flowers✓	Larger flowers✓
Green/ brown/ no showy petals✓	Brightly coloured petals✓
Long feathery/sticky stigma✓	Small inconspicuous stigma✓
No sweet/ reduced scent and nectar✓	Sweet scent and nectar✓
Large protruding/ moveable anthers✓	Anthers short and immoveable✓
Filaments of stamens are long and thin✓	Filaments are short and located in flowers✓
Pollen grains are often dry and light✓	Pollen grains usually sticky and spiked✓

(MARK FIRST THREE) (1* compulsory mark + 6 marks)

(15)

2.4

2.4.1

- Seeds are produced by sexual reproduction, so every seed is genetically different✓, this increases the chance of survival for the species✓
- Seeds have various adaptations✓ to ensure that they are dispersed✓
- Seeds have large amounts of food in cotyledon✓, so plant can survive harsh weathers by remaining dormant✓
- Seeds have special dispersal mechanisms✓, helping plants to spread over a wide area✓ (Mark first TWO) (4)

2.4.2 Seeds such as beans, maize, peas etc. ✓ provide a staple source of food for humans✓/ Seeds may serve as beverages, i.e. cocoa

(ANY relevant explanation) (2)

(7)

TOTAL QUESTION 2: 50 MARKS

QUESTION 3

3.1

3.1.1 Oesophagus✓ **(1)**

3.1.2 - *Peristalsis✓

- During swallowing, circular muscles of oesophagus above the bolus contract✓/ oesophageal tube above the bolus is narrowed

Circular muscles below the bolus relaxes✓/ oesophageal tube below bolus is widened

The bolus is forced downwards✓

(1* compulsory mark + ANY 2 marks) (3)

3.1.3 Bile✓ (1)

3.1.4 - Emulsifies large fat globules✓ into small fat droplets which aids digestion

- Neutralises the acidic fluid (chyme) ✓ which comes from the stomach
- Keeps food fluid✓/ promote peristalsis in the small intestine
- Acts as an antiseptic✓/ prevents decay of food particles in the small intestine
- Help with absorption of fat-soluble vitamins✓/ vitamin A, D, E and K.

(Mark FIRST TWO) (2)

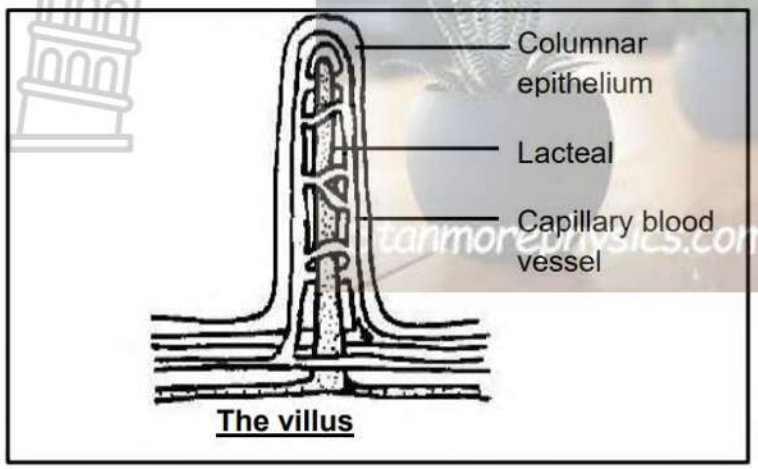
3.1.5 - It is an exocrine gland because it secretes pancreatic juices which are taken into small intestine by pancreatic duct✓ in order to digest carbohydrates, protein and lipids in the small intestine✓.

- It is an endocrine gland because it controls blood glucose levels✓ in the body

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by releasing hormones into blood streams✓. (4)

3.1.6



Correct diagram	1 mark
Caption	1 mark
Any Three correct labels	3 marks

(5)

(16)

3.2

3.2.1 - The rate of photosynthesis increases✓ as the light intensity increases✓,

- therefore increasing the mean mass of lettuce plants✓* (1* + ANY 1) (2)

3.2.2 370 grams✓ (1)

3.2.3 - Carbon dioxide✓ (CO_2)

- Temperature✓ (2)

3.2.4 Raised the….

- level of CO_2 to an optimum level of 4%✓

- temperature to 25 °C✓

- light intensity to 8 arbitrary units✓ (Any TWO) (2)

3.2.5 The rate of photosynthesis would drop✓/ decrease, since the high temperature will denature enzymes✓/ make enzymes functionless (2)

3.2.6 - Provision of food/energy for organisms✓ in the higher trophic levels. Primary producers absorb radiant energy✓, and they form the base of the food pyramid, providing food to other consumers above them.

- Control of carbon dioxide and oxygen levels in the atmosphere✓

Photosynthesis uses up large amounts of CO_2 which can lead to harm in living organisms and in turn releases oxygen✓ which is required by organisms for respiration. (4)

(13)

3.3

3.3.1 - Cytoplasm✓/ cytosol/ cytoplasmic matrix

- Mitochondrion✓ (2)

3.3.2 (a) Glucose✓ (1)

(b) - Carbon dioxide✓

- Water✓ (2)

(c) Pyruvic acid✓ (1)

3.3.3 Aerobic respiration requires oxygen✓,

while anaerobic respiration occurs in the absence of oxygen✓ (2)

3.3.4 - CO_2✓

- Alcohol✓/ Ethanol (Mark FIRST ONE) (1)

(9)

3.3.5

(a) Bread✓/ cheese/ wine/ cider/ brandy/ beer (ANY ONE) (1)

(b) The production of food increases food supply to the population✓, therefore ensuring food stability✓ at lower cost.

OR Production of food and beverages provide local people with jobs✓ to help reduce unemployment✓

OR the country can sell and export products✓ to other countries and therefore bringing in more money for the country✓

(ANY RELEVANT EXPLANATION) (2)

3.4

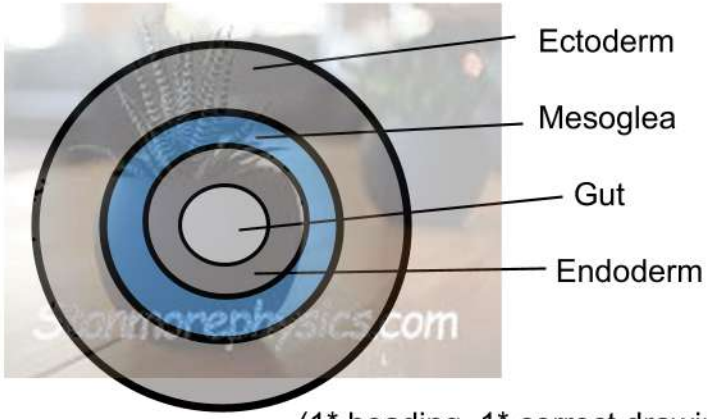


3.4.1 Kingdom Animalia✓/ animal kingdom (1)

3.4.2 Cnidaria✓ (1)

3.4.3 Radial symmetry✓ (1)

3.4.4 <u>Body wall of Cnidaria</u>



(1* heading, 1* correct drawing and 2* any correct label)

(4)

3.4.5

(a) Vertebrates are organisms which have a backbone✓/ vertebral column,

While invertebrates do not have a backbone✓ (2)

(b) Invertebrates (bees/moths/butterflies) serve as pollinating agents✓, and this

Helps flowering plants bear fruits in agriculture✓

Invertebrates (worms, beetles etc.) break down complex organic molecules into simpler molecules✓/ decompose organic molecules which are released into the environment and reused in nutrient cycle to provide nutrients✓ for growing agricultural plants

Invertebrates (earthworms) burrow in the soil and make tunnels through the soil✓, these tunnels allow gases to move through and aerate the soil✓ by allowing gases and water to move through the soil for improved drainage✓/ for plant roots to penetrate the soil✓/ The faeces of earthworms are rich in nutrients for plants and also enrich the soil✓ (ANY FOUR)

(4)

(13)

TOTAL: 50

TOTAL SECTION B: 100

Question	Biodiversity of microorganism	Biodiversity of plants	Biodiversity of animals	Photosynthesis	Animal nutrition	Cellular Respiration	A	B	C	D
	27	27	17	29	29	21	60	38	30	22
1.1.1		2					2			
1.1.2				2					2	
1.1.3		2							2	
1.1.4	2								2	
1.1.5	2									2
1.1.6				2			2			
1.1.7					2		2			
1.1.8				2					2	
1.1.9					2	2				
1.2.1		1					1			
1.2.2					1		1			
1.2.3			1				1			
1.2.4						1	1			
1.2.5						1	1			
1.2.6			1				1			
1.2.7			1				1			
1.2.8						1	1			
1.2.9	1						1			
1.2.10					1		1			
1.3.1			2					2		
1.3.2					2			2		
1.3.3						2		2		
1.3.4				2				2		
1.4.1				1			1			
1.4.2				1			1			
1.4.3				1						1
1.4.4				2				2		
1.4.5				1			1			
1.4.6				1			1			
1.4.7				1				1		
1.5.1					1		1			
1.5.2 (a)					1		1			
(b)					1		1			
1.5.3					1		1			
1.5.4					2		2			
2.1.1	3								3	
2.1.2	1								1	

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