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 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 Biology or if it is out of context.

13. **If common names given in terminology**
Accept provided it is accepted at *this* memo discussion.

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, graphs, tables, etc.) must have a caption

18. If you have doubts consult the other language memo, if still have doubts ask the Provincial Internal Moderator to contact the National Internal Moderator or the External Moderators.

19. **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.

20. No changes must be made to the marking memoranda without consulting the Provincial Internal Moderator who in turn will consult with the External Moderator/s

21. Only memoranda bearing the signatures of the UMALUSI moderators and distributed by the National Department of Education via the Provinces must be used.

SECTION A

QUESTION 1

1.1.1 A✓✓
1.1.2 C✓✓
1.1.3 B✓✓
1.1.4 D✓✓
1.1.5 B✓✓
1.1.6 D✓✓
1.1.7 B✓✓ 7 x 2 **(14)**

1.2.1 Crypts of Lieberkühn ✓/Brunners glands
1.2.2 Carbaminohaemoglobin✓/Hb.CO_2 /carbhaemoglobin
1.2.3 Mitochondrion✓
1.2.4 Lactic acid✓
1.2.5 Kwashiorkor✓
1.2.6 Nitrogen✓
1.2.7 Monoculture✓/monocultivation **(7)**

1.3.1 B✓✓only/ B
1.3.2 A✓✓only/ A
1.3.3 B✓✓only/ B
1.3.4 B✓✓only/ B
1.3.5 None✓✓
1.3.6 Both A & B✓✓/A & B 6 x 2 **(12)**

1.4.1 Iodine✓ solution
1.4.2 Blue✓/black/blue black
1.4.3 Millon's reagent✓/biuret/sodium hydroxide and copper sulphate
1.4.4 Brick-red✓/wine-red/violet/purple/pink
1.4.5 Ether✓/ethanol/alcohol/chloroform/(carbontetrachloride)
1.4.6 Translucent✓/greasy/fat/oily spot
1.4.7 Fehlings A & B✓/Benedicts
1.4.8 Orange-red✓/orange/orange-yellow/brick-red/brown/yellow-brown **(8)**

1.5.1 Photosynthesis✓ (1)
1.5.2 35✓ ^{0}C✓ (2)
1.5.3 - as temperature increases✓food production increases✓
- until optimum temperature✓/35 ^{0}C is reached for maximum food production✓
- further increase in temperature✓ results in a decrease✓ in food production
Any 4 x 1 (4)
1.5.4 The experiment is about increasing food production ✓
If we measure total mass we cannot accurately✓ determine food production
Because we cannot control the amount of water in the food✓/amount of water varies
Therefore the food must be measured after removing the water✓/after it is dried
Any 2 X 1 (2)
(9)

1.6.1 A – oesophagus✓/(gullet)
B – cardiac sphincter✓/valve
C – pancreas✓
D – common bile and pancreatic duct✓/hepato-pancreatic duct (4)

1.6.2 amylase ✓ acts on starch✓to form maltose✓
lipase✓ acts on fats✓ to form fatty acids and glycerol✓
trypsin✓ (trypsinogen)✓ acts on proteins✓ to form polypeptides✓/peptones
OR
Trypsin✓(trypsinogen)/acts on polypeptides✓ to form peptones✓
OR
Chymotrypsin✓ acts on polypeptides✓ to form peptones✓
(Mark first TWO only) (6)
(10)

TOTAL SECTION A: 60

SECTION B

Question 2

2.1.1 B✓and D✓
or
B✓ and C✓
or
B✓ and E✓
or
C✓ and D✓
Any 2 X 1 (2)

2.1.2 Enzyme✓ (1)

2.1.3 Co-enzyme✓/co-factor/metal ion (1)
substance Y cannot work on the substrate✓✓ as seen in test tube D
or
substance Y only works when combined with X ✓✓/the enzyme
or
substance Y speeds up the action of X✓✓ as seen in test tube C (2)

2.1.4 X/enzyme was boiled✓/ high temperature and became
denatured✓ and could therefore not digest substance S✓ Any 2 X1 (2)

2.1.5 stomach✓ (1)
It works in an acidic medium✓✓ (2)

2.1.6 0,0 ✓/zero/nothing/none (1)
(12)

2.2.1 (a) B✓starch grain✓ (2)
(b) C✓stroma✓ (2)
(c) A✓lamellae✓/thyllakoids/grana (2)

2.2.2 more✓carbon dioxide outside than inside✓the membrane/less✓ CO_2
inside than outside✓ (2)

carbon dioxide is used✓ during dark phase✓in the stroma✓of the
chloroplast✓ Any 3 X 1 (3)

2.2.3 light energy✓ will split the water✓✓(photolysis) to release high energy hydrogen✓
atoms which combine with co-enzymes ✓✓NADP and
oxygen✓ which is released✓ Any 5 X 1 (5)
(16)

2.3

Photosynthesis	Cellular respiration
- energy stored✓/(anabolic)	- energy released✓/(catabolic)
- takes place in the chloroplast✓/plant cells	- takes place in the mitochondrion✓/all living cells
- light-dependent process✓	- light-independent✓process/ takes place in day & night
- absorbs CO_2✓	- absorbs O_2✓
- releases O_2 ✓	- releases CO_2✓
- uses water ✓	- releases water✓
- increase in dry mass✓	- decrease in dry mass✓
- glucose is formed✓	- glucose is used✓

Any 3 x 2 (6)
+ 1 for table (1)

(Mark first THREE only)

TOTAL QUESTION 2: 35

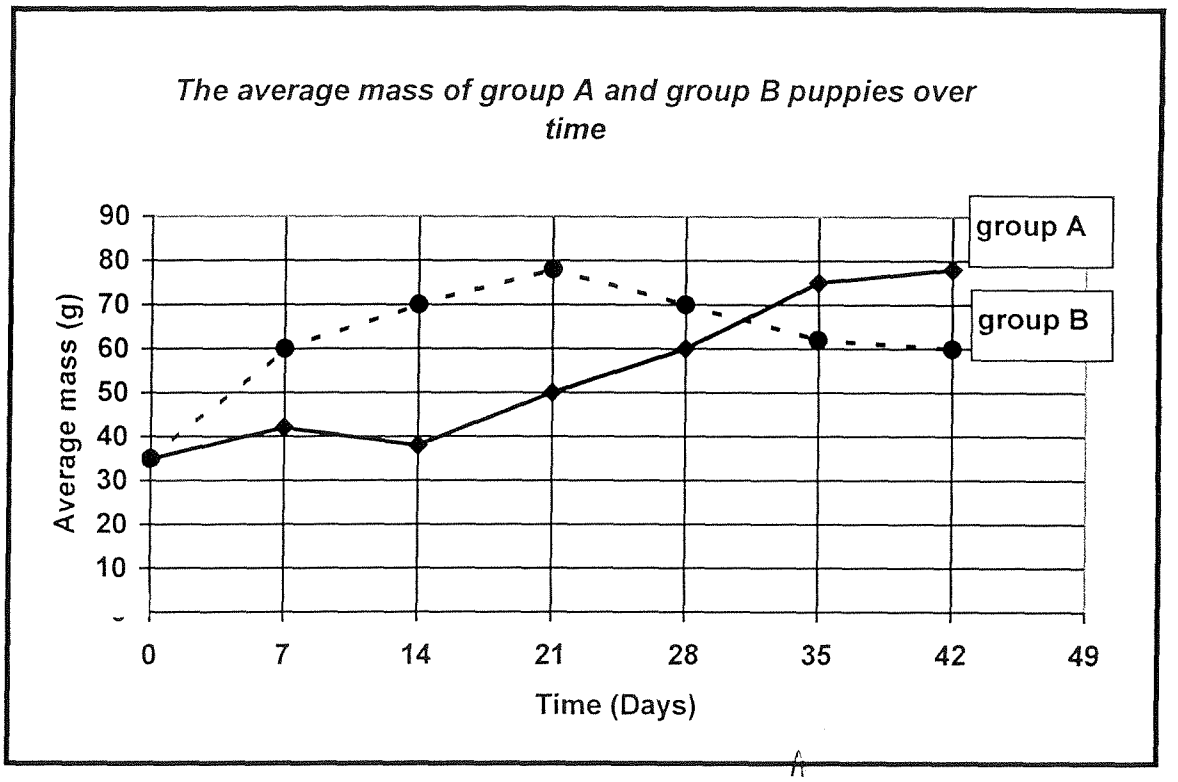
QUESTION 3

3.1.1 (a) fructose✓ (1)
(b) galactose✓ (1)

3.1.2 A – fructose✓
B – glucose✓
C – glucose✓
D – galactose✓ (4)

3.1.3 glucose✓ and fructose✓ (2)
(8)

3.2.1



Rubric for the mark allocation of the graphs

Correct type of graphs	1			
Title of graph	1			
Correct choice for X and Y axes	1			
Correct label and unit for X axis	1			
Correct label and unit for Y axis	1			
Appropriate scale for X-axis (constant intervals)	1			
Appropriate scale for Y-axis (constant intervals)	1			
Plotting of points for graph A	3: plotted all 7 points correctly	2 : plotted 5 or more of the points correctly	1: plotted 3 or less of the points correctly	0: no points plotted
Plotting of points for graph B	3: plotted all 7 points correctly	2 : plotted 5 or more of the points correctly	1: plotted 3 or less of the points correctly	0: no points plotted
All plotted points joined for group A and B	1			
Differentiating between graph A and B	1			

(15)

Wrong type of graph is drawn: marks will be lost for "correct type of graph" as well as for "plotting of points"

If TWO separate graphs are drawn, mark first one only

3.2.2 - to ensure they were all of the same age✓✓
- to ensure minimum genetic variation✓✓/similar genes
- to control variables✓✓/ ensure results are valid

Any 1 X 2 (2)

3.2.3 milk was removed from the diet✓✓ (2)

3.2.4 milk contains substances that promote growth✓✓ (2)

3.2.5 proteins✓/vitamins/fatlactose/galactose/glucose
(Mark first TWO Only) (2)

3.2.6 50✓ g✓ (2)

3.2.7 days 0✓ and 29 - 34✓ (2)
(27)

TOTAL QUESTION 3: 35

QUESTION 4

4.1.1 (a) impala ✓✓/lions/cheetahs (2)

(b) lions and the cheetahs✓✓ (2)

(c) lions/cheetahs catching the impala✓✓ (2)

(d) winter✓✓/cold weather/low temperature (2)

(No mark will be awarded for weather or temperature alone)

4.1.2 grass✓/shrub/young tree → impala✓ → lion✓/cheetah (3)

(If arrows are pointing to the wrong direction/missing give no mark)

4.1.3 nearly all the grass/shrubs/young trees had been eaten✓✓/ not enough food/ predation (2)

4.1.4 because of the overgrazing✓✓/ the veld/food was destroyed/winter/veld recovery was slow (2)

4.1.5 the maximum number✓ of individuals that can be supported by an environment✓ (2)
(17)

4.2.1 Yes✓ plots spread over the garden✓✓/no particular order (3)

4.2.2 (a) $\frac{15+10+7+11+20+5+16}{7}$ ✓ ✓ or $\frac{84}{7}$

$= 12$✓ (3)

(b) 12✓ x 30✓ = 360✓ (3)

4.2.3 census✓/counting
(Mark first ONE only) (1)
(10)

4.3.1 study of the changes✓ in the number ✓of a population and
the factors✓/parameters that influence these changes
the rate✓ at which the population increases/decreases
processes✓ that regulate the population size Any 3 X 1 (3)

4.3.2 phase where organisms acclimatize✓/establish/adapt to the new environment and look for partners to mate✓ with no or little growth✓ Any 2 X 1 (2)

(5)

4.4 - human population explosion✓
- feeding the world✓/famine/food production/poverty
- changes in fecundity✓
- diseases✓/e.g.HIV/AIDS
- pesticides✓
- global warming✓/climatic change/depletion of ozone layer
- pollution✓
- lack of space✓/shelter
- soil erosion✓/deforestation
- increasing alien plants✓

(Mark first THREE only) (3)

TOTAL QUESTION 4: 35

QUESTION 5

5.1.1 walking✓✓ (2)

5.1.2 metabolic processes✓✓ / e.g cellular respiration /digestion/ excretion
OR
physiological processes✓✓/ e.g breathing/ heartbeat (2)

5.1.3 doubles it ✓/increases it/ deepens/ becomes more (1)

5.1.4 (1 000 cm^3 X 40)✓ = 40 000✓ cm^3✓ (3)

5.1.5 (a) Oxidative phosphorylation✓✓/terminal oxidation/hydrogen transfer system (2)

(b) To prevent the formation of lactic acid because the metabolic rate✓✓/ heartbeat, etc. is still high/to pay back the oxygen debt/break down of lactic acid (2)

5.1.6 (a) 150✓ x (20 x 60)✓ = 180 000✓
OR
150✓ x 1200✓ =180 000✓ (3)

(b) particles are caught in the moist mucous membrane✓✓/ hairs in nostrils remove pollen particles from the air that enters (2)
17)

5.2 Inhalation/inspiration✓

- Breathing is controlled by the medulla oblongata✓
- active phase✓
- diaphragm contracts✓ and becomes flattened✓/less convex/move downwards
- the volume/length of the thoracic cavity is increased✓
- the external intercostal muscles contract✓
- the internal intercostal muscles relax✓
- the abdominal muscles relax✓
- and the rib-cage is lifted✓/moves upwards and outwards
- pressure on the lungs/interpleural cavity decreases✓
- elastic lungs expands and pressure decreases✓
- since atmospheric pressure is greater than the pressure on the lungs✓
- air rich in oxygen flows into the lungs✓ **max 8**

Exhalation/expiration✓

- passive phase✓
- the diaphragm relaxes✓/moves upwards and become arched/more convex
- the length of the thoracic cavity is decreased✓
- the internal intercostals muscles contract✓

- the external intercostal muscles relax✓
- the abdominal muscles contract✓
- and the rib-cage is lowered✓/moves downwards and inwards
- the volume of the thoracic cavity decreases✓
- pressure on the lungs/interpleural cavity increases✓
- elastic lungs are compressed and pressure increases✓
- air rich in carbon dioxide is forced out of the lungs✓ **max 7**

OR

- Breathing is controlled by the medulla oblongata✓
- the mechanism of breathing is related to the difference in pressure✓
- in the thoracic cavity✓ and the atmosphere
- the interpleural space✓ is airtight✓
- and the pressure in the interpleural space is slightly lower✓
- than the pressure in the alveoli✓
- air will thus flow in✓ to equalise✓ the pressure in the lungs and the interpleural space
- air flows through the air passages into the elastic lungs✓which enlarge✓to fill the whole of the thoracic cavity
- if the thoracic cavity enlarges✓the interpleural pressure will further decrease✓
- allowing more air to enter the lungs✓
- the lungs thus follow the enlargement of the thoracic cavity passively✓
- if the thoracic cavity is reduced✓ in size
- the pressure outside the lungs will increase✓
- forcing air out of the lungs✓

Any 15 X 1

Factual Content: (15)

Synthesis:

Marks	Descriptions
3	Well structured – demonstrates insight and understanding of question
2	Minor gaps in the logic and flow of the answer
1	Attempted but with significant gaps in the logic and flow of the answer
0	Not attempted/nothing written other than question number

Synthesis: 03

(18)

TOTAL SECTION C: 35

1. **Indien meer inligting as die puntetoekenning gegee word**
   Hou op merk nadat die maksimum punte verkry is en trek 'n kronkellyn en dui 'maks' punte in die regterkantse kantlyn aan.

2. **Indien, by voorbeeld drie redes vereis en vyf word gegee.**
   Merk net die eerste drie ongeag daarvan of almal of sommige korrek / nie korrek is nie.

3. **Indien die hele proses beskryf word terwyl slegs 'n deel vereis word**
   Lees alles en krediteer die relevante dele.

4. **Indien vergelykings vereis, maar beskrywings word gegee**
   Aanvaar indien die verskille/ooreenkomste duidelik is.

5. **Indien tabulering vereis word en paragrawe word gegee**
   Kandidate sal punte verbeur indien nie getabuleer nie.

6. **As geannoteerde diagramme aangebied in plaas van beskrywings wat vereis word**
   Kandidate sal punte verbeur.

7. **Indien vloeidiagramme i.p.v beskrywings aangebied word**
   Kandidate sal punte verbeur.

8. **Indien die volgorde vaag en skakelings nie sin maak nie**
   Krediteer waar volgorde en skakelings korrek is. Waar volgorde en skakelings nie korrek is nie, moenie krediteer nie. As die volgorde weer korrek is, gaan voort om te krediteer.

9. **Onherkenbare afkortings**
   Aanvaar indien dit aan begin van antwoord omskryf is. Indien dit nie omskryf is nie, moenie die onherkenbare afkorting krediteer nie, maar krediteer die res van die antwoord indien dit korrek is.

10. **Verkeerd genommer**
    Indien die antwoorde die regte volgorde van die vrae pas, is dit aanvaarbaar.

11. **Indien die taal wat gebruik word die bedoelde betekenis verander**
    Moenie aanvaar nie.

12. **Spelfoute**
Aanvaar as dit herkenbaar is, met die voorbehoud dat dit nie iets anders in Biologie beteken nie of as dit buite konteks is.

13. **Indien gewone name gegee word in terminologie**
Aanvaar, indien dit by die memobespreking aanvaar is.

14. **Indien slegs letter vereis word en slegs die naam word gegee (en andersom)**
Geen krediet

15. **As eenhede van mate nie aangedui word**
Kandidate sal punte verbeur. Memorandum sal afsonderlike punte vir eenhede aandui.

16. Wees sensitief vir die **betekenis van die antwoord, wat soms op verskillende maniere aangebied kan word**

17. **Opskrif.** Alle illustrasies (soos diagramme, tekeninge, grafieke, tabelle, ens.) moet van `n opskrif voorsien word

18. As u twyfel, raadpleeg die memo in die ander taal, as u steeds twyfel vra die Provinsiale Interne Moderator om kontak met die Nasionale Interne of Eksterne Moderatore te maak.

19. **Vermenging van amptelike tale (terme/konsepte)**

Slegs 'n enkele woord of twee wat in enige ander amptelike taal anders as die leerder se assesseringstaal waarin die meeste van sy/haar antwoorde aangebied word, moet gekrediteer word, indien dit korrek is. 'n Nasiener wat in die relevante amptelike taal vaardig is, behoort geraadpleeg te word. Dit geld vir alle amptelike tale.

20. Geen veranderinge mag aan die goedgekeurde memorandum aangebring word sonder dat daar met die Provinsiale Interne Moderator, wat op sy/haar beurt met die Eksterne Moderator(e), sal beraadslaag, nie.

21. Slegs memorandums wat die handtekeninge van die UMALUSI moderatore bevat en deur die Nasionale Departement van Onderwys versprei word, mag gebruik word.

AFDELING

VRAAG 1

1.1.1 A✓✓
1.1.2 C✓✓
1.1.3 B✓✓
1.1.4 D✓✓
1.1.5 B✓✓
1.1.6 D✓✓
1.1.7 B✓✓ 7 x 2 **(14)**

1.2.1 Lieberkühn-kripte ✓/ kliere van Brünner
1.2.2 Karbaminohemoglobien✓/Hb.CO_2/karbhemoglobien
1.2.3 Mitochondrium✓
1.2.4 Melksuur✓
1.2.5 Kwasjiorkor✓
1.2.6 Stikstof✓
1.2.7 Monokultuur✓/monokultivering **(7)**

1.3.1 slegs B✓✓/ B
1.3.2 slegs A✓✓/ A
1.3.3 slegs B✓✓/ B
1.3.4 slegs B✓✓/ B
1.3.5 Geeneen✓✓
1.3.6 Beide A & B✓✓/A & B 6 x 2 **(12)**

1.4.1 Jodium✓oplossing
1.4.2 Blou✓/swart/blouswart
1.4.3 Millon's reagens✓/biuret/natriumhidroksied en kopersulfaat
1.4.4 baksteenrooi✓/wynrooi/violet/pers/pienk
1.4.5 Eter✓/etanol/alkohol/chloroform (koolstoftetrachloried)
1.4.6 Deurskynende✓/vetkol/oliekol
1.4.7 Fehlings A & B✓/Benedicts
1.4.8 Oranjerooi✓/oranje/oranje-geel/baksteenrooi/bruin/geelbruin **(8)**

1.5.1 Fotosintese✓ (1)
1.5.2 35✓ ^{0}C✓ (2)
1.5.3 - as die temperatuur toeneem✓verhoog voedselproduksie✓
- totdat 'n optimum temperatuur✓/ 35 ^{0}C bereik is vir maksimale voedselproduksie✓
- verdere toename in temperatuur✓ veroorsaak 'n afname✓in voedselproduksie
Enige 4 x 1 (4)

1.5.4 Die eksperiment is i.v.m. 'n toename in voedselproduksie✓
As ons die totale massa meet kan ons nie die voedselproduksie akkuraat✓ bepaal nie
Omdat die hoeveelheid water in voedsel nie beheer kan word nie✓/waterinhoud varieer
Daarom moet die voedsel afgemeet word nadat die water verwyder is✓ /nadat dit gedroog is

Enige 2 X 1 (2)
(9)

1.6.1 A – oesofagus✓/(slukderm)
B – kardiale sfinkter✓/sluitspier/klep
C – pankreas✓
D – gemeenskaplike gal- en pankreasbuis✓/hepato-pankreale buis (4)

1.6.2 amilase ✓ werk in op stysel✓ om maltose te vorm✓
lipase✓ werk in op vette✓ om vetsure en gliserol te vorm✓
tripsien✓/ (tripsinogeen) werk in op proteïene✓ om polipeptiede✓ te vorm/peptone
OF
tripsien✓(tripsinogeen) werk in op polipeptiede✓ om peptone✓ te vorm
OF
chemotripsien✓ werk in op polipeptiede✓ om peptone✓ te vorm (6)
(Merk slegs eerste TWEE)

(10)

TOTAAL AFDELING A: 60

AFDELING B

Vraag 2

2.1.1 B✓en D✓
of
B✓ en C ✓
of
B✓ en E✓
of
C✓ en D✓ Enige 2 X 1 (2)

2.1.2 Ensiem✓ (1)

2.1.3 Ko-ensiem✓/ko-faktor/metaalioon (1)
stof Y kan nie op die substraat inwerk nie✓✓ soos gesien in proefbuis B
of
stof Y kan slegs werk as dit aan X gebind is ✓✓/die ensiem
of
stof Y versnel die reaksie van X✓✓ soos gesien in proefbuis C (2)

2.1.4 X/ensiem is gekook✓/hoë temperature en word
gedenatureer✓ en kon gevolglik nie stof S verteer nie✓ Enige 2 X1 (2)

2.1.5 maag✓ (1)
dit werk in 'n suurmedium✓✓ (2)

2.1.6 0,0✓ /nul/niks/geen (1)
(12)

2.2.1 (a) B✓styselkorrel✓ (2)
(b) C✓stroma✓ (2)
(c) A✓lamelle✓/tillakoïedes/grana (2)

2.2.2 meer✓koolstofdioksied aan buitekant as binnekant✓/minder✓
koolstofdioksied aan binnekant as buitekant✓ (2)

koolstofdioksied word gebruik✓ tydens donkerfase✓
in die stroma✓van die chloroplast✓
Enige 3 X 1 (3)

2.2.3 ligenergie✓ splits die water✓/(fotolise) en stel hoë-energieryke waterstofatome✓vry
wat met die ko-ensiem ✓/NADP verbind en suurstof✓ word vrygestel✓
Enige 5 X 1 (5)
(16)

2.3

Fotosintese	Sellulêre respirasie
- energie geberg✓/ (anabolies/opbouend)	- energie vrygestel✓/ (katabolies/afbrekend)
- vind plaas in die chloroplast✓/plantselle	- vind plaas in die mitochondrium✓/alle lewende selle
- ligafhanklike proses✓	- onafhanklik van lig✓/vind plaas dag en nag
- absorbeer CO_2✓	- absorbeer O_2✓
- stel O_2 vry ✓	- stel CO_2 vry✓
- water gebruik✓	- water vrygestel✓
- toename in droë massa✓	- afname in droë massa✓
- glukose gevorm✓	- glukose gebruik✓

enige 3 x 2 (6)
+ 1 vir tabel (1)

(Merk slegs eerste DRIE)

TOTAAL VRAAG 2: 35

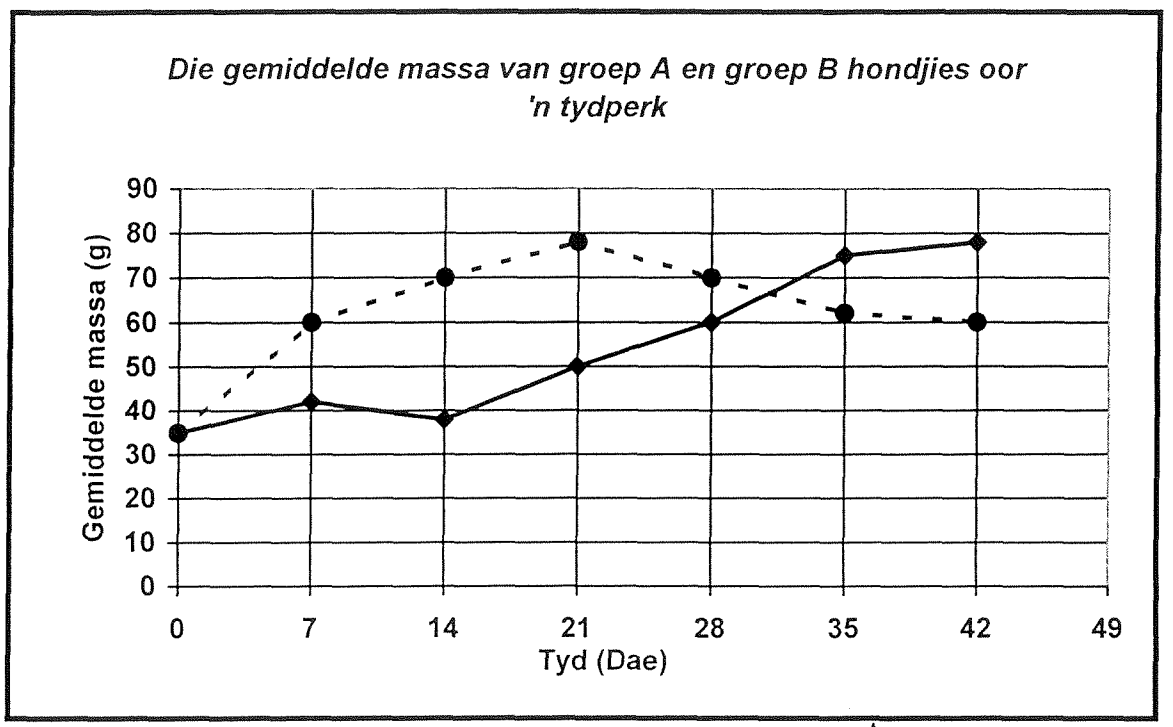
VRAAG 3

3.1.1 (a) fruktose✓ (1)
(b) galaktose✓ (1)

3.1.2 A – fruktose✓
B – glukose✓
C – glukose✓
D – galaktose✓ (4)

3.1.3 glukose✓ en fruktose✓ (2)
(8)

3.2.1



Rubriek vir die toekenning van punte vir grafieke

Korrekte tipe grafiek	1			
Opskrif van die grafiek	1			
Korrekte keuse vir die X-as en Y-as	1			
Korrekte byskrif en eenheid vir X-as	1			
Korrekte byskrif en eenheid vir die Y-as	1			
Geskikte skaal vir die X-as (konstante intervalle)	1			
Geskikte skaal vir die Y-as (konstante intervalle)	1			
Stip van punte van grafiek A	3: al 7 punte korrek gestip	2 : 5 of meer punte korrek gestip	1: 3 of minder punte korrek gestip	0: geen punte gestip
Stip van punte van grafiek B	3: al 7 punte korrek gestip	2 : 5 of meer punte korrek gestip	1: 3 of minder punte korrek gestip	0: geen punte gestip
Alle gestipte punte vir groep A en B verbind	1			
Onderskei tussen grafiek A en B	1			

(15)

Verkeerde tipe grafiek geteken: punte sal verloor word vir "korrekte tipe grafiek" sowel as vir "stip van punte"

As TWEE aparte grafieke getrek word, merk slegs eerste een

3.2.2 - om te verseker dat hulle almal ewe oud is✓✓
- om minimale genetiese variasie te verseker✓✓/dieselfde gene
- om veranderlikes te beheer✓✓/om te verseker dat resultate geldig is

Enige 1 X 2 (2)

3.2.3 melk is uit die dieet verwyder✓✓ (2)

3.2.4 melk bevat stowwe wat groei bevorder✓✓ (2)

3.2.5 proteïene✓ en vitamiene✓/vet /laktose/galaktose/glukose (2)
(Merk slegs eerste TWEE)

3.2.6 50✓ g✓ (2)

3.2.7 dag 0✓ en 29 - 34✓ (2)
(27)

TOTAAL VRAAG 3: **35**

VRAAG 4

4.1.1 (a) rooibokke ✓✓/leeus/jagluiperds (2)

(b) leeus en die jagluiperds✓✓ (2)

(c) leeus/jagluiperds wat die rooibokke vang✓✓ (2)

(d) winter✓✓/ koue weersomstandighede/lae temperatuur (2)
Geen punte sal toegeken word vir slegs weersomstandighede en temperatuur

4.1.2 gras✓/bossies/jong bome → rooibokke✓ → leeu✓/jagluiperd (3)

(pyle in verkeerde rigting/afwesig, geen punte)

4.1.3 omtrent al die gras/bossies/jong bome is opgevreet✓✓/ nie genoeg voedsel nie/ predasie (2)

4.1.4 omrede oorbeweiding✓✓/ die veld/voedsel is vernietig/winter/herstel van veld was stadig (2)

4.1.5 die maksimum aantal✓ individue wat deur 'n omgewing✓ onderhou kan word (2)
(17)

4.2.1 Ja✓ persele in tuin versprei✓✓/geen spesifieke volgorde (3)

4.2.2 (a) $\frac{15 + 10 + 7 + 11 + 20 + 5 + 16}{7}$ ✓ ✓ OF $\frac{84}{7}$
= 12✓ (3)

(b) 12✓ x 30✓ = 360✓ (3)

4.2.3 sensus✓/telling ***(Merk slegs eerste EEN)*** (1)
(10)

4.3.1 studie van die veranderinge✓ in die getalle ✓van 'n bevolking en die faktore✓/parameters wat hierdie veranderinge beïnvloed die tempo✓ waarteen die bevolking vermeerder/verminder prosesse✓ wat die bevolkingsgrootte reguleer Enige 3 X 1 (3)

4.3.2 fase wanneer die organismes akklimatiseer✓/vestig/aanpas by die nuwe omgewing en vir paringsgenote soek✓ met min of geen groei✓ Enige 2 X 1 (2)

(5)

4.4
- menslike bevolkingsontploffing✓
- voedsel vir die wêreld✓/hongersnood/voedselproduksie/armoede
- veranderinge in fekunditeit✓
- siektes ✓/bv. MIV/VIGS
- beheer van peste✓
- aardverwarming✓/klimaatveranderings/beskadiging van osoonlaag
- besoedeling✓
- geberk aan ruimte✓/skuiling
- gronderosie✓/ontbossing
- toename in uitheemse plante✓

(Merk slegs eerste DRIE) (3)

TOTAAL VRAAG 4: 35