SECTION A

Question 1

1.1
1.1.1 A ✓✓
1.1.2 B✓✓
1.1.3 D✓✓
1.1.4 D✓✓
1.1.5 C✓✓
1.1.6 D✓✓/B

6 x 2 **(12)**

1.2
1.2.1 chlorophyll✓
1.2.2 ATP✓
1.2.3 pleural membrane/pleura✓
1.2.4 bolus✓
1.2.5 deamination✓
1.2.6 egestion✓/defaecation

(6)

1.3
1.3.1 I ✓✓
1.3.2 F ✓✓
1.3.3 A ✓✓
1.3.4 G ✓✓
1.3.5 E ✓✓
1.3.6 H ✓✓
1.3.7 B ✓✓

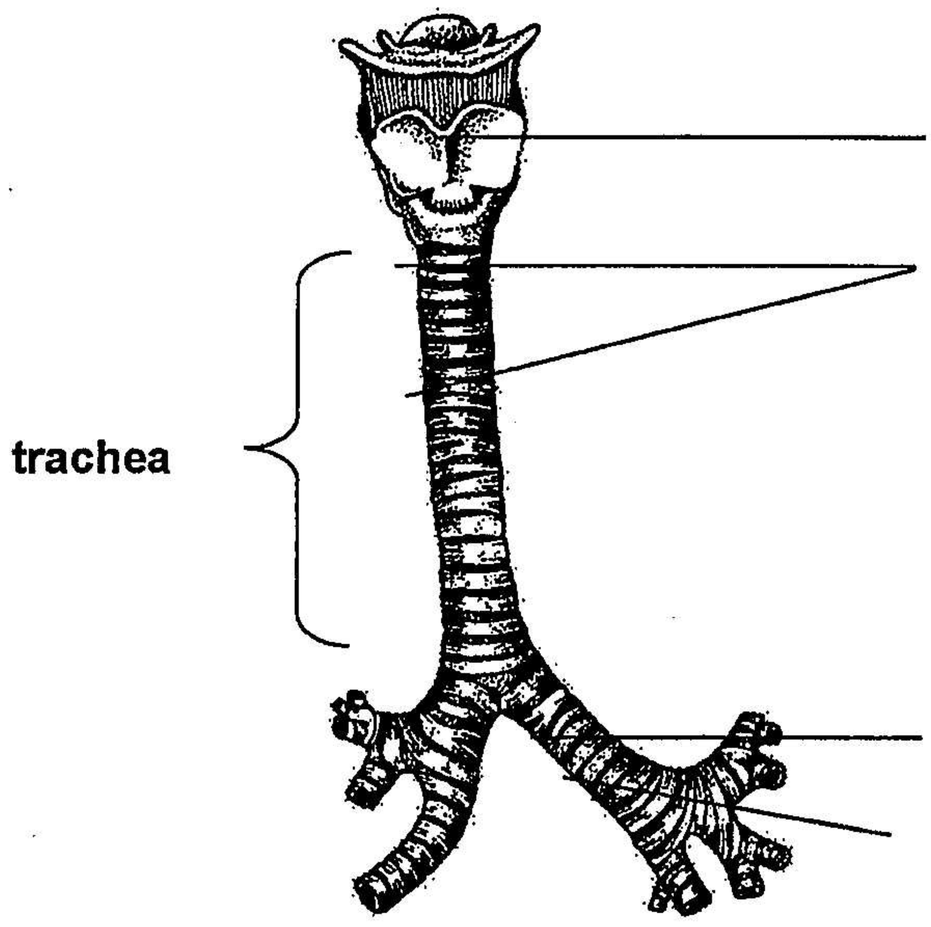
7 x 2 **(14)**

1.4

Incorrect	Correct
1.4.1 Cuboidal ✓	Columnar ✓ (2)
1.4.2 Bubbles of oxygen gas ✓/	Bubbles of carbon dioxide gas✓ (2)
Oil layer✓	No oil layer✓ (2)

(4)

1.5



Part of the respiratory system

[A simple line diagram/drawing is acceptable]

* any 4 labels	:		4
* correct shape	:	1	
* proportion	:	1	
* caption	:	1	

NOTE: If a drawing is given which indicates that the bell jar apparatus (either by shape or labels) no marks to be given for labels and caption, but may be credited for shape and proportion.

(7)

1.6

1.6.1 (i) producers✓/autotrophs
(ii) (secondary) consumers✓ / carnivores/heterotrophs/predators (2)

1.6.2 - poor rainfall ✓/ drought✓/ extreme temperature changes/ earthquakes/ floods/diseases/etc.

(mark the first TWO only)

2 x 1 (2)

1.6.3 = 65 – 20 – 10 ✓
= 35 ✓kJ✓ (3)
(7)

TOTAL SECTION A: 50

Question 2

2.1

2.1.1 B – Pancreas✓
C – (Descending) colon✓/large intestine
E – Rectum ✓
F – Appendix ✓
H – Gall bladder ✓ (5)

2.1.2 (i) Glycogen ✓
Blood ✓
Iron ✓
vitamins ✓ (A, D and B_{12})
(*mark the first THREE only*) (3)

(ii) Insulin ✓ and Glucagon ✓ (2)

(iii) Hydrochloric Acid ✓(HCl) (1)

2.1.3 - absorbs water, ✓
- absorbs mineral salts,✓
- absorbs bile salts,✓
- absorbs soluble vitamins✓
- absorbs vitamin K✓
- faeces are temporarily stored here✓
- passage way /transports for undigested and indigestible materials✓/
(mark the first TWO only) (2)
(13)

2.2

2.2.1 - Food **X** ✓ because it contains fibre ✓ (2)
2.2.2 - 50 ✓✓ (2)
2.2.3 - Water during nutrition serves as:

- A liquid medium for chemical reactions ✓
- A transport medium for nutrients and non-absorbed food residues ✓
- A reactant in hydrolysis ✓/digestion
- as a solvent for nutrients in the alimentary canal ✓
- lubricates alimentary canal✓/aids swallowing

(mark the first THREE only) (3)
(7)

2.3
- grind test material ✓ and place into a test tube
- add ether✓/ethanol/alcohol/benzene/carbon tetrachloride
- shake thoroughly ✓
- filter the ether and allow a drop of filtrate ✓
- on clean filter paper ✓
- leave to dry ✓/ ether to evaporate
- translucent greasy spot/stain ✓
- shows the presence of fat ✓
- if no stain then no fat ✓

OR

- rub fatty food ✓ on filter✓/blotting paper/brown paper
- leave to dry ✓
- a translucent greasy spot/stain ✓
- shows the presence of fat ✓
- if no stain then no fat ✓

Any 5 x 1 **(5)**

Total Question 2: 25

Question 3

3.1

3.1.1 A Epidermis ✓
C Spongy ✓ mesophyll
D Palisade ✓ mesophyll

B Chloroplasts ✓

(4)

3.1.2 - Cuticle /epidermis ✓ allow light to penetrate✓ to the chlorophyll in the mesophyll cells
- Large number of chloroplasts ✓ in the palisade cells allow maximum absorption of light ✓
- Palisade cells situated immediately beneath the upper epidermis ✓ for maximum absorption of light ✓
- The cylindrical ✓/ vertical / elongated shape of the palisade cells allows more cells to be packed maximises absorption of light ✓
- Intercellular air spaces ✓ in the spongy mesophyll allow rapid diffusion of CO_2 into chloroplast ✓
- Xylem tissue✓ in veins of leaves for constant supply of water for photosynthesis ✓
- The phloem tissue✓ in the veins ensures that products of photosynthesis are transported to the other parts of the plant ✓
- stomata✓ present for gaseous exchange✓

(Mark the first THREE only) Any 3 x 2 (6)

3.1.3 - Radiant energy is transformed into chemical energy ✓
- Provides energy /food for organisms in the higher trophic levels ✓
- Fossil fuels such as coal and oil were derived from plants ✓/Energy stored in these fuels was originally trapped during photosynthesis
- Maintains balance of oxygen✓/carbon dioxide✓ content of the atmospheric air

OR

- uses up CO_2 ✓ and releases O_2✓

(Mark the first TWO only) Any 2 x 1 (2)

(12)

3.2

3.2.1 (i) - In I there is an even distribution of light ✓around the entire filament;
- oxygen is released evenly✓ since photosynthesis takes place on the entire filament (2)

(ii) Photosynthesis occurs at the point where light is concentrated ✓
hence there is a production of oxygen ✓ here (2)

3.2.2 (i) Photosynthesis ✓ (1)

(ii) chlorophyll ✓
water ✓
carbon dioxide ✓
light ✓/**radiant** energy
enzymes ✓

(Mark the first ONE only)

Any 1 x 1 (1)
(6)

3.3
3.3.1 Mammal A has mainly plant material in its diet/herbivore ✓
Mammal B has mainly animal material in its diet/carnivore ✓

(*Mark first DIFFERENCE only*) (2)

3.3.2 (i) Seeds ✓
Epidermal cells of grass ✓
Epidermal cells of shrubs ✓

(Mark the first TWO only) Any 2 x 1 (2)

3.3.3 - prevents constipation ✓/by absorbing water
- encourages peristalsis ✓/decreases transit time
- prevents absorption of poisonous substances from faeces to blood ✓
- prevents cancer✓ of the colon

(Mark the first THREE only) Any 3 x 1 (3)
(7)

Total Question 3: 25

Question 4

4.1
4.1.1 (34 – 35) ✓ °C ✓ (2)

4.1.2 15 ✓ mg ✓ (2)

4.1.3 – Enzyme activity is slow in lower temperatures✓
- As temperature increases ✓ enzyme activity also increases ✓
- Maximum enzyme activity at optimum ✓ temperature/ 35° C ✓/body temperature
(4)

4.1.4 - No more food will be broken down ✓
- This is because enzymes are denatured ✓ at this temperature and so cannot function ✓ (3)
(11)

4.2
4.2.1 10 thousand ✓✓/10 000 (2)

4.2.2 Lag phase ✓/establishment phase
(1)

4.2.3 - slow growth ✓
- predators still adapting to new environment ✓ / acclimatization /
- finding partners is difficult ✓
- organisms have not reached reproductive✓ age
Any 2 x 1 (2)

4.2.4 - Yes ✓ / it was successful (1)

4.2.5 - The insect pest ✓ has been completely wiped out ✓ (2)

4.2.6 - protect environment (ecosystem)✓ / soil from pollution ✓
- prevent transfer of chemical along the food chain ✓ which could become harmful to other species on the farm ✓
- prevent destruction ✓of non-pest insects ✓
(mark first ONE only) (2)

4.2.7 - By eating the insects, predators reduce the number of their prey ✓
- As the number of the insect (prey) population drops ✓
- more competition ✓ among the predators prevails
- thus resulting in a decrease ✓ in the number of predators
- and an increase ✓ in the number of prey
- and a corresponding increase ✓ in the predator population
- Finally the insect/prey population was wiped out ✓
- causing death of individuals within the predator population ✓
- Resulting in the predator population also dropping ✓ Any 4 (4)

(14)

Total Question 4: 25

Question 5

5.1
5.1.1 Contracts ✓
5.1.2 Relaxes ✓
5.1.3 Intercostal✓ muscle
5.1.4 Increases ✓
5.1.5 Decreases ✓
5.1.6 Pressure ✓
5.1.7 Decreases ✓ (7)

5.2.1
(i) A ✓
(ii) D ✓/X/ from Y to X

(iii) C ✓/ D
(iv) Y ✓
(v) Y ✓ (5)

5.2.2 - a single layer of epithelium/endothelium ✓ provides a thin surface ✓ for diffusion of gases
- moisture ✓ lining the wall of alveoli to allow gases to dissolve ✓
- sac-like / balloon shape ✓ increases surface area ✓ for diffusion of gases
- Blood capillaries ✓ provides efficient mode of transportation of gases ✓
- biconcave✓/flattened discs therefore increases surface area for absorption of gases✓
- contains haemoglobin ✓ to absorb oxygen and carbon dioxide ✓
- it is flexible / pliable ✓ thus able to move easily through the blood capillaries ✓
- absence of nucleus ✓ therefore more space for carrying gases✓
- due to its large size ✓ / RBC moves slowly through the capillary allowing more time ✓ for the absorption of gases

(Mark the first TWO only) 2 x 2 (4)

5.3
5.3.1 To show that carbon dioxide ✓ is released during cellular respiration ✓ (2)

5.3.2 (i) Serves as a control ✓/ to verify that cellular respiration / to verify that organisms release CO_2 (1)

(ii) Indicates the presence ✓/absence of carbon dioxide (1)

5.3.3

A	B	C
Lime water turns milky ✓/ Positive result	No change✓/ Lime water remains unchanged / Negative result	Lime water turns milky ✓/ Positive result

1 mark for the table

(4)

NOTE: Grid lines not necessary - only columns and rows are expected

5.3.4 - Movement of air in and out of the test tubes ✓/stopper
- Temperature/no light/out of light ✓
- Mass of organism must be the same ✓
- Volume of lime water must be the same✓
- Volume of atmospheric gas must be the same✓ Any 1 x 1 (1)

(9)

Total Question 5: 25

AFDELING A

Vraag 1

1.1
1.1.1 A√√
1.1.2 B√√
1.1.3 D√√
1.1.4 D√√
1.1.5 C√√
1.1.6 D√√/B

6 x 2 **(12)**

1.2
1.2.1 chlorofil√
1.2.2 ATP√
1.2.3 Pleura / longvlies√
1.2.4 bolus√
1.2.5 deaminasie√
1.2.6 egestie√/defekasie/ontlasting

(6)

1.3
1.3.1 I √√
1.3.2 F√√
1.3.3 A√√
1.3.4 G√√
1.3.5 E√√
1.3.6 H√√
1.3.7 B√√

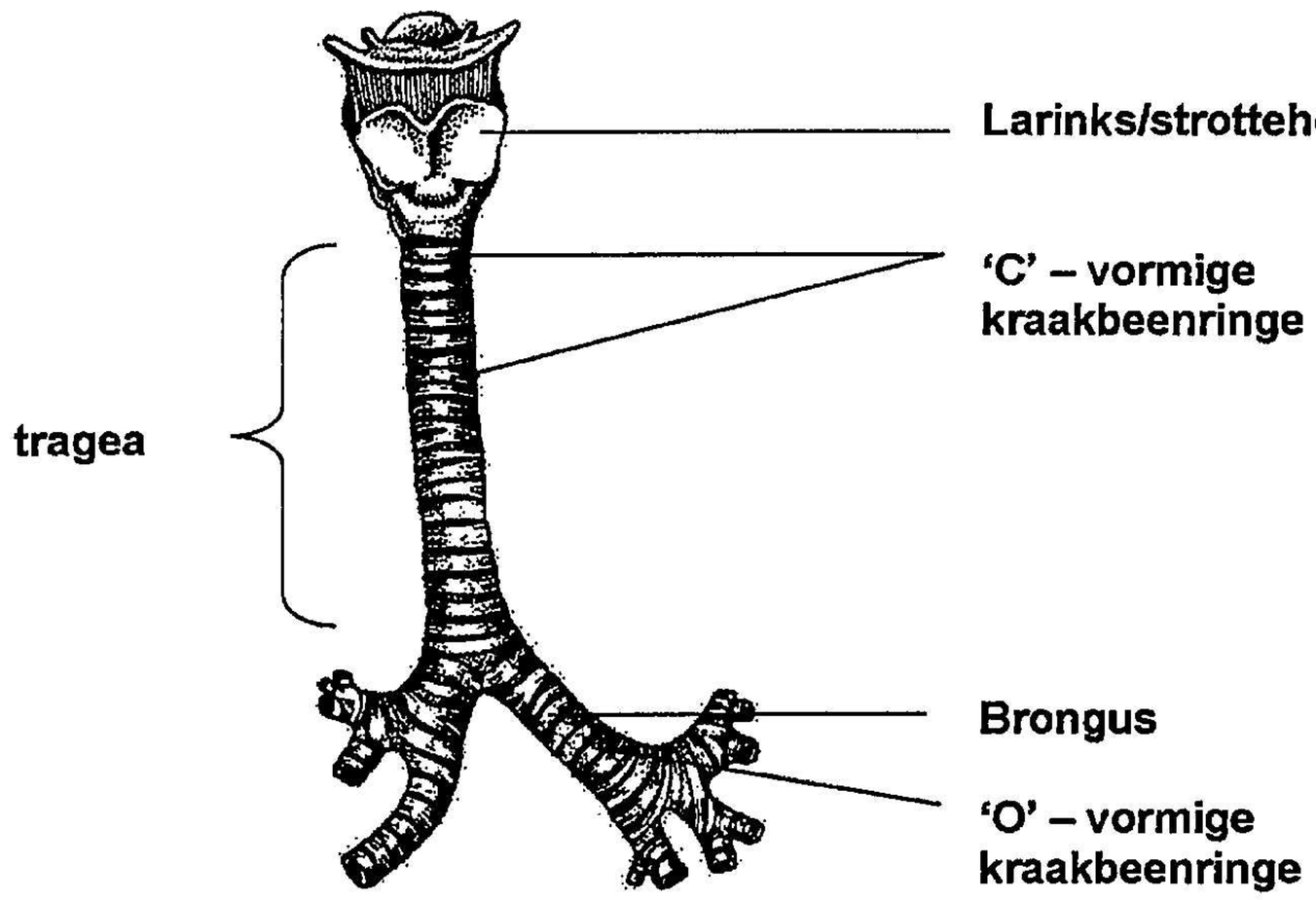
7 x 2 **(14)**

1.4

Foutiewe	**Korrekte**	
1.4.1 Kubies √	Kolom √	(2)
1.4.2 Borrels van suurstofgas √ / Olielaag√	Borrels van koolstofdioksiedgas√ / No oil layer√	(2) (2)

(4)

1.5



Deel van die asemhalingstelsel

['n Eenvoudige lyndiagram/tekening is aanvaarbaar]

* enige 4 byskrifte	:	4
* korrekte vorm	:	1
* verhouding/proporsie	:	1
* opskrif/titel	:	1

LET WEL: Indien 'n diagram van die klokglasapparaat geteken is, word slegs punte toegeken vir vorm en verhouding. Geen punte vir opskrif en byskrifte. **(7)**

1.6

1.6.1 (i) produseerders√ /outotroof
(ii) (sekondêre) verbruikers√ / karnivore / heterotroof/ predatore (2)

1.6.2 – lae reënval √ / droogte√/ uiterste temperatuurveranderings/ aardbewings/ vloede/ siektes/ens.
(merk slegs die eerste TWEE) 2 x 1 (2)

1.6.3 = 65 – 20 – 10 √
= 35 √ kJ √ (3)
(7)

TOTAAL AFDELING A: 50

Vraag 2

2.1

2.1.1 B – Pankreas√
C – (Dalende) kolon√ /dikderm
E – Rektum√
F – Appendiks/(blindederm)√
H – Galblaas√ (5)

2.1.2 (i) Glikogeen √
Bloed √
Yster √
vitamiene A, D en B_{12} √
(merk slegs die eerste DRIE) Enige 3 x 1 (3)

(ii) Insulien√ en Glukagon√ ***(merk slegs die eerste TWEE)*** (2)

(iii) Soutsuur√ (HCl) (1)

2.1.3 - absorbeer water √
- absorbeer minerale soute√
- absorbeer galsoute√
- absorbeer oplosbare vitamienes√
- absorbeer vitamien K√
- feses word hier tydelik gestoor√
- deurgang/vervoer vir verteerde en onverteerde materiale√
(merk slegs die eerste TWEE)
Enige 2 x 1 (2)
(13)

2.2

2.2.1 - Voedsel **X** √ omdat dit vesel bevat √ (2)
2.2.2 - 50 √√ (2)
2.2.3 - Tydens voeding dien water as 'n:

- Vloeibare medium vir chemiese reaksies √
- Vervoermiddel vir voedingstowwe en ongeabsorbeerde voedselreste √
- reagens by hidrolise√/vertering
- oplosmiddel vir voedingstowwe in die spysverteringskanaal √
- smeermiddel in spysverteringskanaal√/ bevorder slukproses

(merk slegs die eerste DRIE) Enige 3 x 1 (3)
(7)

2.3
- maal die toetsmonster fyn√en plaas dit in 'n proefbuis
- voeg eter√/etanol/alkohol/bensien/koolstofterachloried by
- skud deeglik √
- filtreer die eter en laat 'n druppel van die filtraat √
- op 'n skoon stukkie filtreerpapier val √
- laat staan om droog te word √/ eter om te verdamp
- 'n deurskynende vetkol√/ merk
- toon teenwoordigheid van vette aan √
- vetkol afwesig, bevat geen vet √

OF

- vryf vetterige kos √ teen filtreer/kladpapier/bruin papier
- laat staan om droog te word √
- 'n deurskynende vetkol/merk √
- toon teenwoordigheid van vette aan √
- vetkol afwesig, bevat geen vet √

Enige 5 x 1 **(5)**

Totaal Vraag 2 : 25

Vraag 3

3.1

3.1.1 A Epidermis √
C Spons√mesofil
D Palissade√mesofil

B Chloroplaste √ (4)

3.1.2 - Epidermis√/ kutikula laat lig deur√ om tot by die chlorofil in die mesofilselle deur te dring
- Baie chloroplaste √ in die palissadeselle wat maksimum absorpsie van lig √ toelaat
- Palissade selle lê net onder die boonste epidermis √ vir maksimum absorpsie van lig √
- Die silindriese√/regop /verlengde vorm van die palissade selle vir maksimum absorpsie van lig √
- Intersellulêre lugruimtes in die sponsmesofil laat vinnige diffusie van CO_2 na die chloroplaste plaasvind √
- Xileemweefsels in die are van die blare √ vervoer voortdurend water vir fotosintese √
- Floeëmweefsels in die are √ verseker dat die produkte wat tydens fotosintese gevorm word na ander dele van die plant vervoer word √
- Stomata√ teenwoordig vir gaswisselling√

(Merk slegs die eerste DRIE) Enige 3 x 2 (6)

3.1.3 - Sonligenergie word omgeskakel na chemiese energie √
- Voorsien energie/voedsel vir organismes op die hoër trofiese vlakke √
- Brandstowwe soos olie en steenkool kom van plante √/ Energie wat in die brandstowwe gestoor word is oorspronklik tydens fotosintese vasgevang
- Handhaaf die balans van die suurstof√/koolstofdioksied√samestelling in die atmosfeer

OF

Neem CO_2 op√ en stel O_2 vry√

(Merk slegs die eerste TWEE) Enige 2 x 1 (2)
(12)

3.2

3.2.1 (i) - By I word lig egalig √ rondom die hele filament versprei;
- suurstof word egalig versprei √ omdat fotosintese op die hele filament plaasvind (2)

(ii) Fotosintese vind slegs plaas waar die lig gekonsentreerd is √ daarom word suurstof √ slegs daar vrygestel (2)

3.2.2 (i) Fotosintese (1)

(ii) chlorofil √
water √
koolstofdioksied √
lig √ **sonlig**energie
ensieme √

(Merk slegs die eerste EEN)

Enige 1 x 1 (1)
(6)

3.3
3.3.1 Soogdier A se dieet bestaan hoofsaaklik uit plantmateriaal / herbivoor √
Soogdier B se dieet bestaan hoofsaaklik uit dierlike materiaal / karnivoor √

(Merk slegs EERSTE verskil) (2)

3.3.2 (i) Sade √
Epidermale selle van gras √
Epidermale selle van struike √

(Merk slegs die eerste TWEE) Enige 2 x 1 (2)

3.3.3 - voorkom hardlywigheid √ absorbeer water
- bevorder peristaltiese bewegings √ verminder deurgangtyd
- voorkom die absorpsie van gifstowwe vanaf die feses na die bloed √
- voorkom kanker van die kolon√

(Merk slegs die eerste DRIE) Enige 3 x 1 (3)
(7)

Totaal Vraag 3 : 25

Vraag 4

4.1
4.1.1 (34 – 35) √ °C √ (2)

4.1.2 15 √ mg√ (2)

4.1.3 - Ensiemaktiwiteit stadiger by 'n laer temperatuur√
- As die temperatuur styg √ neem ensiemaktiwiteit ook toe √
- Maksimum ensiemaktiwiteit by optimum √ temperatuur/ 35° C /liggaamstemp. (4)

4.1.4 - Geen voedsel afgebreek nie√
- Omdat ensieme denatureer √ by hierdie temp. en daarom nie funksioneer nie √ (3)
(11)

4.2
4.2.1 10 duisend√√ /10 000√ √ (2)

4.2.2 Sloerfase √ /vestigingsfase (1)

4.2.3 - stadige groeifase √
- predatore pas nog aan by nuwe omgewing √ / akklimatiseer
- soek individue om mee te paar√
- organismes het nog nie volwassenheid bereik nie√ Enige 2 x 1 (2)

4.2.4 - Ja√ /dit was suksesvol (1)

4.2.5 - Die insekplaag √ is totaal uitgewis √ (2)

4.2.6 - voorkom besoedeling van die omgewing (ekosisteem) / grond √ √
- voorkom die oordrag van chemikalieë in die voedselketting wat skadelik kan wees vir die ander spesies op die plaas √ √
- voorkom dat nuttige insekte uitgeroei word √ √
(merk slegs die eerste EEN) Enige 1 x 2 (2)

4.2.7 - As die predatore die insekte eet, neem die getalle van hulle prooi af √
- As die getalle van die insekbevolking (prooi) afneem √
- heers daar groter kompetisie √ tussen die predatore
- wat 'n afname √ in die getalle van die predatore tot gevolg het
- dit lei tot 'n toename √ in die getalle van die prooi
- en dienooreenkomstig 'n toename √ in die predatorbevolking
- eindelik word die insek-/ prooibevolking finaal uitgewis √
- wat veroorsaak dat indidue in die predatorbevolking sterf √
- wat tot gevolg het dat die predatorbevolking ook afneem √ Enige 4 x 1 (4)
(14)

Totaal Vraag 4 : 25

Vraag 5

5.1
5.1.1 Trek saam √
5.1.2 Verslap √
5.1.3 Tussenribspiere√
5.1.4 Vergroot √/vermeerder/neem toe
5.1.5 Verklein √ /verminder /neem af
5.1.6 Druk √
5.1.7 Verlaag √/neem af (7)

5.2.1 (i) A √
(ii) D √ /X/van Y na X
(iii) C √ /D
(iv) Y √
(v) Y √ (5)

5.2.2 - 'n enkele laag epiteelselle/endoteel ✓ voorsien 'n dun oppervlak ✓ vir die diffusie van gasse
- vog ✓ in die binnewand van die alveolus waarin gasse kan oplos ✓
- sakvormig / ballonvormig ✓ vergroot die gaswisselingsoppervlak ✓vir diffusie
- Kapillêre bloedvate ✓ voorsien 'n doeltreffende vervoermiddel✓ van die gasse
- bikonkaaf ✓/plat skyfies vergroot daarom die oppervlak vir die absorpsie van gasse✓
- bevat hemoglobien ✓ om suurstof en koolstofdioksied te absorbeer ✓
- is buigsaam /sag ✓en kan dus maklik deur die bloedkapillêres beweeg ✓
- kern afwesig ✓ groter oppervlak om meer suurstof te vervoer ✓
- a.g.v. hulle grootte ✓ beweeg hulle stadig in kapillêres en dus meer tyd ✓om gasse te absorbeer

(Merk slegs die eerste TWEE) 2 x 2 (4)

5.3
5.3.1 Om aan te toon dat koolstofdioksied √ vrygestel word tydens sellulêre respirasie √ (2)

5.3.2 (i) Dien as kontrole √/ te verifieer dat tydens sellulêre respirasie plaasvind / verifieer dat organismes CO_2 vrystel (1)

(ii) Dui die aanwesigheid/afwesigheid van koolstofdioksied aan √ (1)

5.3.3

A	B	C
Helder kalkwater word melkerig √ / Positiewe resultaat	Geen verandering√/ Helder kalkwater bly onveranderd / Positiewe resultaat	Helder kalkwater word melkerig √ / Positiewe resultaat

Geen matrikslyne is nodig nie. Kolomme en tye word verwag.

+1 punt vir tabel (4)

5.3.4 - Beweging van lug in en uit die proefbuise √ /rubberprop
- Temperatuur √

Enige 1 x 1 (1)
(9)

Totaal Vraag 5: 25