

SECTION A**Question 1**

1.1

- 1.1.1 C✓✓
 1.1.2 C✓✓
 1.1.3 A✓✓
 1.1.4 B✓✓
 1.1.5 B✓✓
 1.1.6 B✓✓
 1.1.7 D✓✓

7 x 2 (14)

- 1.2.1 Epiglottis✓
 1.2.2 Mastication✓/mechanical (physical) digestion
 1.2.3 Ileo-caecal✓ valve/sphincter
 1.2.4 Micro-nutrients ✓/ trace elements / vitamins
 1.2.5 Iodine✓

(5)

- 1.3.1 None✓✓
 1.3.2 Both A and B✓✓/Both/A+B
 1.3.3 Both A and B or B only✓✓ /Both/ A+B
 1.3.4 A only ✓✓/A
 1.3.5 A only ✓✓/A
 1.3.6 B only ✓✓/B
 1.3.7 Both A and B ✓✓/Both/ A+B

7 x 2 (14)

- 1.4.1 To show :
 - alcoholic ✓ fermentation ✓/anaerobic✓ respiration ✓ /
 - yeast cells respire ✓ anaerobically ✓ / in absence of oxygen /
 - CO₂✓/ heat is released during anaerobic ✓ /respiration/ alcoholic fermentation

(2)

- 1.4.2 to expel✓/ remove the oxygen / to concentrate the sugar

OR

to sterilize ✓ / kill germs/micro-organisms

(1)

- 1.4.3 (i) to indicate the presence of carbon dioxide ✓
(Mark first ONE only)

(1)

- (ii) to provide substrate ✓/ food/ source for the yeast cells to work on/
 / substrate for respiration
(Mark first ONE only)

(1)

- 1.4.4 - Use the same apparatus ✓ / candidates describe apparatus
 - kill the yeast cells ✓ / leave out the yeast / grape juice (2)
 (7)

1.5

- 1.5.1 Vitamins ✓ and mineral ✓ salts (accept names of vitamins and minerals)/
 micronutrients/macronutrients (2)

- 1.5.2 C ✓✓ (2)

- 1.5.3 C ✓✓ (2)

- 1.5.4 C ✓✓ (2)

- 1.5.5 $\frac{2000}{285} \checkmark \times 100 \checkmark$ | 7 sets of 285 ✓ / description
 of same
 7 x 100 ✓
 = (700 - 702) ✓ g | 700 ✓ g (3)
 (11)

1.6 ***If definitions are given without comparisons credit be given only for difference. If only one of the two is defined credit if it is correct***

- 1.6.1 Similarity:
 Both immigration and migration involve movement ✓ of organisms (1)

OR

Both are population parameters/factors affecting population size/ both increase the population of the new habitat

OR

Both are types of dispersal mechanisms

Difference:

Immigration is one way / permanent movement of organisms into ✓ a defined area

Migration is periodic ✓ / seasonal / temporary movement of organisms from one habitat / to

another and a return to it (2)

- 1.6.2 Similarity:
 Both density-dependent and density independent factors cause a decrease / slow down ✓ growth of the population size / regulate population size (1)

Difference:

Density dependent factors are internal ✓ factors / which depend on the number of organisms per unit area (density) of the population

Density independent factors are external ✓ factors / which do not depend on the number of organisms per unit area (density) of the population such as floods, temperature etc. (2)

1.6.3 Similarity:

Both primary and secondary production have to do with accumulation of energy✓/
build-up of biomass (1)

Difference:

While primary production is accumulation /storage/build-up of energy/dry or biomass
in plants✓ /producers through photosynthesis / chemical energy stored

Secondary production is the accumulation of energy/ biomass/dry mass in
consumers✓ / animals (2)

(9)

TOTAL SECTION A: 60

SECTION B

Question 2

- 2.1.1 (i) E - Hepatic portal vein ✓
 H - Hepatic vein ✓
- (ii) B - pancreas ✓
 G - Liver ✓
- In this order if letters not given**
- (2)
- (2)

- 2.1.2 - Maltase ✓
 - Sucrase ✓
 - Lactase ✓
 - Amylase ✓
- Any order
 (Mark the first THREE only)**
- (3)

- 2.1.3 (i) - emulsifies fats ✓ by breaking them up into small droplets
 - neutralises ✓ (reduces) the acidity of the chyme/provides alkaline medium
 - promotes peristalsis ✓ by reducing the fluidity of chyme
 - promotes the absorption of fat soluble vitamins ✓ (A, D, E and K (any one))
 - it is an antiseptic medium ✓ / prevents decomposition in the small intestine
 - assists in the absorption ✓ of fats
 - deodorises faeces ✓
 - adds colour ✓ to faeces
- (Mark the first THREE only)**
- Any 3 x 1 (3)

- (ii) - acts as a germicide ✓ / antiseptic to kill bacteria
 - provides the acidic ✓ medium / lowers pH for enzyme action
 - converts sucrose into glucose and fructose ✓
 - breaks down fibres in food ✓
 - activates pepsinogen into pepsin ✓
 - activates pro-rennin into rennin ✓
- (Mark the first THREE only)**
- Any 3 x 1 (3)

- 2.1.4 H ✓
- during the race most glucose in the cells is used up ✓
 - therefore glycogen ✓ will be converted to glucose ✓ by glucagon ✓
 - to increase the blood sugar level ✓
 - this will leave the liver ✓ via the hepatic vein ✓ / H
- (1)
- Any 4 x 1 (4)
 (5)

- 2.1.5 - deamination ✓ occurs in the liver ✓, resulting in the formation of
 - glucose ✓ and urea ✓.
 - glucose may be used for energy ✓ or stored as glycogen/ fat ✓
 for future use
 - whereas the urea will be transported to the kidneys to be
 excreted ✓ Any 5 x 1 (5)
(23)
- 2.2.1 (i) amylase / enzyme has favourable conditions ✓ for functioning
 therefore it digested the starch ✓ around it
 a clear area as seen around B indicates **absence of starch** ✓
Any 2 x 1 (2)
- (ii) - No digestion of starch ✓ took place
 - Acid medium was unfavourable for amylase ✓ / Amylase is denatured
 - Agar turns blue-black indicating starch is present ✓
Any 2 x 1 (2)
- (iii) - because amylase / enzyme was boiled and destroyed /
 denatured ✓
 - it could not digest starch ✓,
 - hence a blue/black colour indicates the presence of starch ✓
Any 2 x 1 (2)
- 2.2.2 - serves as a control ✓ /to verify that it is amylase that digested the starch in B (1)
- 2.2.3 - Temperature ✓ /37° C
 - Amount /concentration of enzyme ✓ /amylase
 - Size of the holes ✓
 - Time ✓ /duration
 - Concentration of starch in agar ✓
 - Concentration of iodine solution ✓
 - Same apparatus ✓ / combination of substances in holes
 - pH ✓ Any 3 x 1 (3)
- 2.2.4 maltose ✓✓ / glucose/ iodine solution/ agar Any 1 x 2 (2)
- (12)**

Total Question 2: 35

Question 3

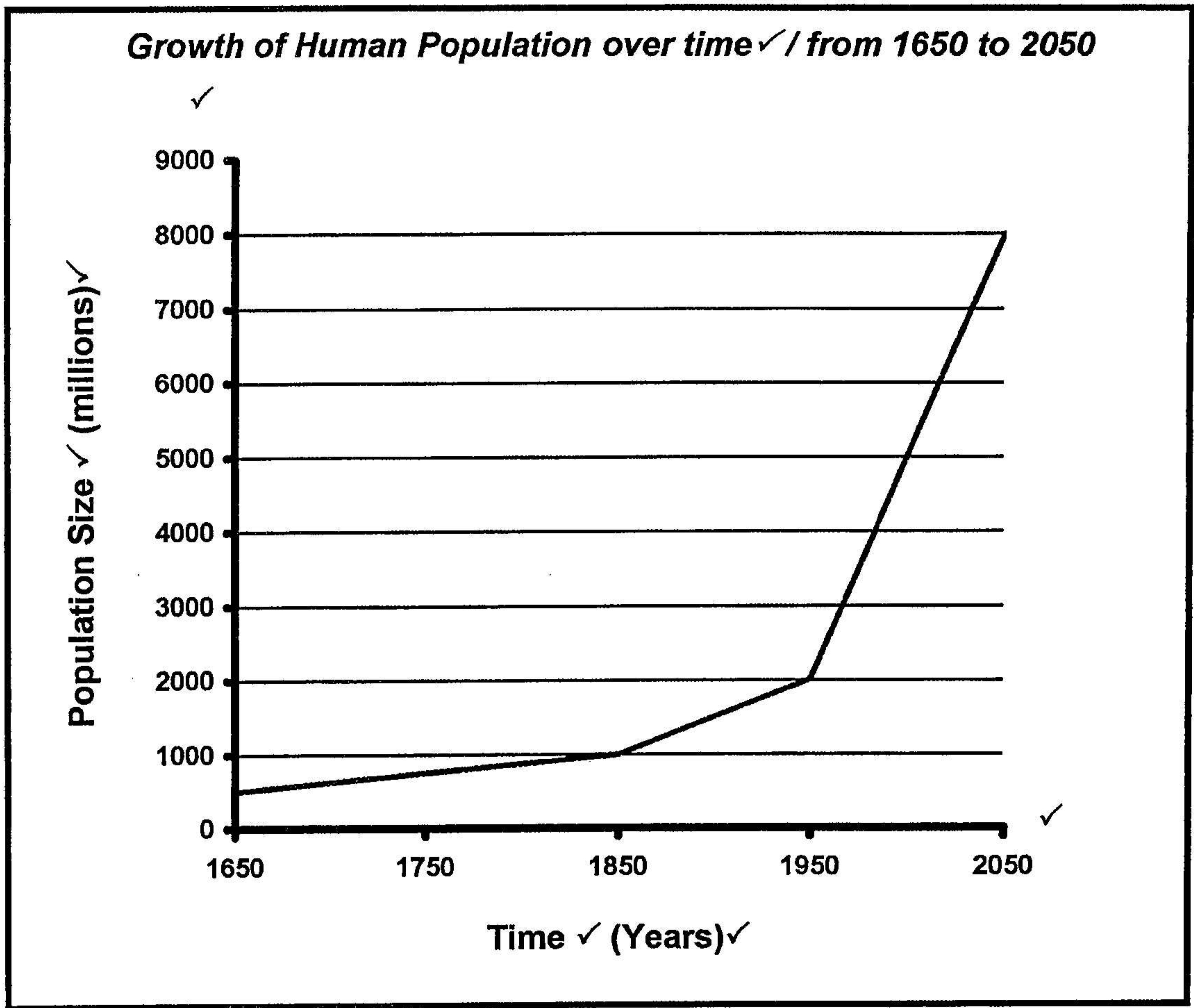
- 3.1.1 - Meat ✓
- Oil and fat ✓
- Sugar ✓ (3)
(Mark first THREE only)

- 3.1.2 – Sugar, oil and fat have high energy (calorie) content ✓✓/
- high cholesterol ✓✓/ and oil and fat in meat / arteriosclerosis
- which can lead to obesity ✓✓/ malnutrition
- as well as heart disease ✓✓
- diabetes ✓✓ (2)
(Mark first ONE only)

- 3.1.3. – fruit ✓
- potatoes ✓
- grain products ✓
- other vegetables ✓ (3)
(Mark first THREE only)

- 3.1.4 - These foods have high ✓roughage (fibre) ✓content /
- which has low ✓energy (calorie) ✓ content /
- Have a high ✓ vitamin / mineral content
- Roughage (fibre) ✓ is important for peristalsis ✓
- and it prevents ✓ cancer of the colon ✓
✓
Any 1 x 2 (2)
(Mark first ONE only) (10)

3.2.1



Marking Rubric for the Graph

▪ Choice and title of Axes	Independent Variable X;	1
	Dependent Variable Y	1
▪ Units for Axes	X-Axis	1
	Y-Axis	1
▪ Scale	Approximate.	
	Not necessarily the mere repetition of data provided for :	
	X Axis	1
	Y Axis	1
▪ Plotting of points	Correctly – All 5 points - 3	3
	3- 4 - 2	
	1 -2 - 1	
	None plotted - 0	
▪ Joining of points		1
▪ Title		1

(11)

NOTE: If bar graph drawn learners will lose marks for choice and title of axes and for joining of points. Credit all other aspects if correct.

3.2.2 exponential ✓/geometric/ J – curve

(1)

- 3.2.3 - decrease in mortality rate ✓
 - increase in natality ✓ of a population
 - improved health services ✓
 - improved quality of nutrition ✓
 - little or no environmental resistance ✓
(Mark first TWO only) 2 x 1 (2)
- 3.2.4 (i) 5 000 million ✓✓ (range: 3 500 – 5 500) / 5 billion ✓✓
For values outside range look at candidates graph (2)
- (ii) 200 ✓ years ✓ (2)
- 3.2.5 (i) estimation ✓/projecting / by extending / continuing the present/past
 pattern of growth / by extrapolating (1)
- (ii) - planning ✓
 - managing ✓/developing/utilizing resources/food production
 - preserving and conserving natural resources ✓
 - design of rescue delivery programmes ✓, such as
 - distribution of the resources ✓ and awareness campaigns
(Mark first TWO only) 2 x 1 (2)
- (iii) - HIV/AIDS epidemic ✓
 - lack of food (starvation) ✓
 - global warming ✓
 - pollution ✓
 - war ✓
 - poverty ✓
 - natural disasters ✓
(Mark first TWO only) 2 x 1 (2)
- (iv) - birth control (family planning) ✓ strategies /lower fecundity
 - improved food production ✓
 - job creation ✓
 - increased provision of energy ✓/water
 - improved medical technology ✓
 - improved education ✓/sex education
 - sustainable/wise utilization of resources ✓
(Mark first TWO only) 2 x 1 (2)
(25)

Total Question 3: 35

Question 4

- 4.1.1 A - bronchiole ✓ /atrium/vestibule / alveolar duct/ opening/entrance to alveolus /direction of air flow
B - wall ✓ of alveolus / epithelium /endothelium
C - red blood corpuscles/erythrocytes ✓ (3)

4.1.2 diffusion ✓ / gaseous exchange (1)

- 4.1.3 - 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

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

- 4.1.4 - X ✓ (1)
- Deoxygenated blood /laden with carbon dioxide in the form of bicarbonate ions ✓ is flowing from the heart ✓ /pulmonary artery/ body cells/ X / to the lungs ✓ through Y for excretion

Any 2 x 1 (2)

- 4.1.5 - 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)
(15)

- 4.2.1 The rate of breathing was higher ✓ when breathing atmospheric air ✓
OR
 The rate of breathing was lower ✓ when breathing oxygen only ✓
OR
 Between 2,5 and 5 minutes ✓ the rate of breathing decreases ✓
OR
 The higher the O₂ concentration ✓ the lower ✓ the rate of breathing
OR
 The lower the O₂ concentration ✓ the higher ✓ the rate of breathing
 Any 1 x 2 (2)
- 4.2.2 - Due to an increase in the rate of aerobic respiration ✓ in the cells
 - the amount of carbon dioxide increases ✓.
 - Since the rate of breathing is lower in oxygen only ✓
 - there is an accumulation ✓ of carbon dioxide in the blood ✓
 - since less is removed ✓
 - Due to the slower rate of gaseous exchange ✓ in the alveolus
 - More CO₂ ✓ taken in when breathing atmospheric air ✓
 (Mark the first TWO only) 2 x 2 (4)
- 4.2.3 *Lactic acid is a product of anaerobic respiration ✓*
 - A higher rate ✓ of anaerobic respiration occurs in the presence ✓
 of lower oxygen concentration ✓ (atmospheric air)
OR
 - A lower rate ✓ of anaerobic respiration occurs in the presence ✓
 of higher oxygen concentration ✓
 ✓* + 3 (4)
- 4.2.4 - Anaerobic respiration ✓ will only take place if O₂ supply is depleted ✓
OR
 - Lactic acid is produced in the muscles ✓ therefore it takes time to diffuse
 into blood ✓ (2)
- 4.2.5 - The rate of breathing decreased ✓ when breathing oxygen only ✓ because
 of higher O₂ ✓ content or a low carbon dioxide content ✓
OR
 -The rate of breathing increased ✓ when breathing atmospheric air ✓ because
 of low O₂ ✓ content or higher CO₂ ✓ content
 Max. 3x1 (3)
- 4.2.6 - Expired air will have more CO₂ / less O₂ ✓ / increases the oxygen debt/
 expired air will contain gases other than oxygen only
 - these factors/variables need to be controlled ✓ during the investigation (2)
- 4.2.7 - A non athlete will not breathe very deeply ✓
 - therefore will breathe at a faster rate ✓
 - therefore more CO₂ accumulates in the alveolus ✓
 - Hence lactic acid will start to accumulate earlier ✓ Any 3 x 1 (3)

(20)

Total Question 4: 35
TOTAL SECTION B: 105

SECTION C

Question 5

5.1.1 To determine whether living organisms (plants/animals) release CO₂ ✓ during respiration ✓ (2)

5.1.2

A	B	C
Nothing will take place ✓ /no change/remains red	Yellow ✓	Yellow ✓

1 mark for table (4)

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

5.1.3 Control ✓/ to verify that organisms are responsible for releasing carbon dioxide (1)

5.1.4 To prevent ✓ the influence of photosynthesis ✓ on the results (2)

- 5.1.5 - The carbon dioxide released during respiration serves as a raw material for the process of photosynthesis ✓
 - The energy ✓ released during respiration is necessary for the life activities of the animal.
 - Brings about a balance in the O₂ and CO₂ levels ✓

(Mark first two only) 2 x 1 (2)

5.1.6 (i) - If the amount of CO₂ released by the snail is the same ✓ as the amount absorbed by the plants ✓ during photosynthesis
 - the indicator will turn red ✓

OR

- If the amount of CO₂ released by the snail is less than ✓ the amount absorbed by the plants ✓ during photosynthesis
 - the indicator will turn purple ✓

OR

- If the amount of CO₂ released by the snail is more than ✓ the amount absorbed by the plants ✓ during photosynthesis
 - the indicator will turn yellow ✓

(3)

(ii) - The results will be the same ✓/no change
 - High level CO₂ will be released ✓ as the animal is still respiring ✓
 - hence solution turns yellow ✓

Any 3 x 1 (3)

(17)

5.2 The Light Phase ✓

- It takes place in the grana/quantasomes/thylakoids ✓ of
 - the chloroplast ✓
 - Radiant energy ✓ is
 - absorbed by chlorophyll molecules ✓ and
 - converted into potential chemical energy ✓
 - The energy is used to:
 - split water ✓/photolysis into
 - hydrogen ✓ and
 - oxygen ✓
 - form ATP ✓/photophosphorylation
 - Oxygen is released ✓ to the atmosphere and
 - the energy-rich hydrogen combines with a co-enzyme /NADP ✓
- Max. (9)**

The Dark Phase ✓/Calvin Cycle/Light Independent phase

- It takes place in the stroma ✓
 - Carbon dioxide ✓ from the atmosphere
 - combines ✓ with hydrogen ✓ from the light phase
 - using energy from ATP from light phase ✓
 - to form carbohydrates ✓, such as
 - glucose ✓/starch
 - reactions are controlled by enzymes ✓
- Max. (6)**

(15)

Rating scale for synthesis in the mini-essay

Mark	Assessment Criteria
0	Not attempted / if flow charts given
1	Significant gaps in the logic and flow of the answer
2	Minor gaps in the logic and flow of the answer
3	Well structured - demonstrate insight and understanding of the question

NOTE: If flow chart is given mark as above but learners will lose 3 marks for synthesis.

(3)

**Total Question 5: 35
TOTAL SECTION C : 35
GRAND TOTAL : 200**

AFDELING A

Vraag 1

1.1

- 1.1.1 C ✓✓
- 1.1.2 C ✓✓
- 1.1.3 A ✓✓
- 1.1.4 B ✓✓
- 1.1.5 B ✓✓
- 1.1.6 B ✓✓
- 1.1.7 D ✓✓

7 x 2 (14)

- 1.2.1 Epiglottis / strotteklep ✓
- 1.2.2 Mastikasie / meganiese (fisiese) vertering ✓
- 1.2.3 Ileosekale ✓ klep/sfinkter
- 1.2.4 Mikrovoedingstowwe / spoorelemente / vitamienne ✓
- 1.2.5 Jodium ✓

(5)

- 1.3.1 Geeneen ✓✓
- 1.3.2 Beide A en B ✓✓ / Beide / A + B
- 1.3.3 Beide A en B of slegs B ✓✓ / Beide / A + B
- 1.3.4 Slegs A ✓✓ / A
- 1.3.5 Slegs A ✓✓ / A
- 1.3.6 Slegs B ✓✓ / B
- 1.3.7 Beide A en B ✓✓ Beide / A + B

7 x 2 (14)

1.4.1 Om

- alkoholiese ✓ fermentasie ✓ / gisting aan te toon / anaërobiese ✓ respirasie ✓ /
- gisselle respireer ✓ anaërobies ✓ / afwesigheid van suurstof /
- CO₂ ✓ / hitte word vrygestel tydens anaërobiese ✓ respirasie / alkoholiese fermentasie

(2)

1.4.2 Om die suurstof te verwyder ✓ / om 'n gekonsentreerde suikeroplossing te vorm ✓

OF

Te steriliseer ✓ / kieme / mikro-organismes te dood

(1)

1.4.3 (i) om die teenwoordigheid van koolstofdoksied aan te toon ✓
(Merk slegs eerste EEN)

(1)

(ii) voorsien 'n substraat ✓ / voedsel / bron waarop die gisselle kan inwerk
(Merk slegs eerste EEN)

(1)

BIOLOGIE/HGN1

- 1.4.4 - Gebruik dieselfde apparaat ✓ / kandidaat beskryf die apparaat
- dood gisselle ✓/sonder gisselle / duiwesap (2)
(7)
- 1.5
- 1.5.1 Vitamiene ✓ en minerale ✓ soute (aanvaar name van vit. en minerale soute) /
mikrovoedingstowwe/ makrovoedingstowwe (2)
- 1.5.2 C ✓✓ (2)
- 1.5.3 C ✓✓ (2)
- 1.5.4 C ✓✓ (2)
- 1.5.5 $\frac{2000}{285} \checkmark \quad X \quad 100 \checkmark$ | 7 stelle van 285 ✓/ beskrywing
 $= (700 - 702) \checkmark \text{ g}$ | $7 \times 100 \checkmark$
700✓g (3)
(11)
- 1.6 **Wanneer definisies sonder vergelykings gegee word gee punte slegs vir verskille. Indien slegs een van die twee gedefinieer word gee punte indien korrek.**
- 1.6.1 Ooreenkoms:
Beide immigrasie en migrasie behels die beweging ✓ van organismes
OF
Beide is bevolkingsparameters / faktore wat die bevolkingsgrootte beïnvloed/
beide vergroot die bevolkingsgrootte van die nuwe habitat
OF
Beide is soorte van verspreidingsmeganismes (1)
- Verskil:
Immigrasie is 'n eenrigting / permanente beweging van organismes na ✓'n
bepaalde gebied
Migrasie is die periodieke / tydelike /seisoenale ✓ beweging van organismes
van een habitat na 'n ander en keer dan terug na die habitat (2)
- 1.6.2 Ooreenkoms:
Beide digtheidsafhanklike – en digtheidsonafhanklike faktore veroorsaak 'n
afname / vertraagde toename in die grootte van die bevolking / reguleer die
grootte van die bevolking (1)
- Verskil:
Digtheidsafhanklike is interne✓ faktore /
is afhanklik van die getal organismes per oppervlakarea (digtheid) van die bevolking
Digtheidsonafhanklike faktore is eksterne faktore✓ /
en is nie afhanklik van die getal organismes per oppervlakarea
(digtheid) van 'n bevolking nie soos vloede, temperatuur, ens. (2)

Kopiereg voorbehou

1.6.3 Ooreenkoms:

Beide primêre- en sekondêre produksie het te doen met die opbou (akkumulering) van energie ✓ / opbou van biomassa

(1)

Verskil:

Primêre produksie is opbou / berg / stoor(akkumulering) van energie / droë of biomassa in plante ✓ / produseerders deur middel van fotosintese / in chemiese energie gestoor

Sekondêre produksie is die opbou (akkumulering) van energie / droë massa/ biomassa in verbruikers ✓ / diere

(2)

(9)

TOTAAL AFDELING A: 60

AFDELING B

Vraag 2

- 2.1.1 (i) E - Lewerpoortaar ✓
 H - Leweraar ✓hepatiese aar } **In hierdie volgorde indien letters nie
 gegee word nie** (2)
- (ii) B - Pankreas ✓/alvleisklier } (2)
 G - Lewer ✓

- 2.1.2 - Maltase ✓
 - Sukrase ✓
 - Laktase ✓
 - Amilase ✓ } **Enige volgorde
 (Merk slegs eerste DRIE)** (3)

- 2.1.3 (i) - emulsifiseer vette ✓ deur dit in klein druppeltjies op te breek
 - neutraliseer ✓ (verminder) die suur van die chiem/ verskaf alkaliese medium
 - bevorder peristalse ✓ deurdat dit die vloeibaarheid van die chiem verminder
 - bevorder die absorpsie van vetoplosbare vitamien ✓ / A, D, E en K (enige een)
 - is 'n antiseptiese medium ✓ / werk ontbinding in die dunderm teë
 - help met die absorpsie ✓ van vette
 - verminder reuke in feses ✓
 - voeg kleur by die feses ✓

(Merk slegs eerste DRIE)

Enige 3 x 1 (3)

- (ii) - is antisepties ✓ / kiemdoder dood bakterieë
 - voorsien die suurmedium ✓ / verlaag pH vir ensiemwerking
 - sit sukrose om in glukose en fruktose ✓
 - breek vesels in voedsel op ✓
 - aktiveer pepsinogeen na pepsien ✓
 - aktiveer pro-rennien na rennien ✓

(Merk slegs eerste DRIE)

Enige 3 x 1 (3)

- 2.1.4 H ✓ (1)
- tydens die resies word die meeste glukose in die selle opgebruik ✓
 - daarom word glikogeen ✓ omgeskakel na glukose ✓ deur glukagon ✓
 - om die bloedsuikervlak te verhoog ✓
 - wat die lewer ✓ deur middel van die leweraar ✓ / H verlaat Enige 4 x 1 (4)
 (5)

- 2.1.5 - deaminasie ✓ vind plaas in die lewer ✓, gevolglik word
 - glukose ✓ en ureum ✓ gevorm
 - Glukose kan as energiebron ✓ benut of gestoor word as glikogeen ✓ / vet vir latere gebruik
 - terwyl die ureum na die niere vervoer word vir uitskeiding ✓ Enige 5 x 1 (5)
(23)

- 2.2.1 (i) amilase / ensiem het gunstige toestand ✓ vir ensiemwerking en verteer die stysel ✓ rondom B daarom dui die helder gedeelte rondom B die **afwesigheid van stysel aan** ✓ Enige 2 x 1 (2)
- (ii) - Geen vertering van stysel ✓ het plaasgevind nie
- Suurmedium was ongunstig vir amilase ✓ / amilase denatureer
- Agar kleur blouswart omdat stysel aanwesig is Enige 2 x 1 (2)
- (iii) - omdat die amilase/ensiem gekook en vernietig/ gedenatureer ✓ is
- kon dit nie die stysel verteer ✓ nie
- kleur daarom blouswart omdat stysel aanwesig is ✓ Enige 2 x 1 (2)
- 2.2.2 - dien as 'n kontrole ✓ /te kontroleer dat dit wel amilase is wat die stysel in B verteer (1)
- 2.2.3 - Temperatuur ✓ /37°C
- Hoeveelheid /konsentrasie van ensiem ✓ /amilase
- Grootte van die gate ✓
- Tyd ✓ / tydsduur
- Konsentrasie van die stysel in die agar ✓
- Konsentrasie van jodiumoplossing ✓
- Dieselfde apparaat ✓ /kombinasie van stowwe in gate
- pH ✓ Enige 3 x 1 (3)
- 2.2.4 maltose ✓ ✓ / glukose /jodiumoplossing/agar Enige 1 x 2 (2)

(12)

Totaal Vraag 2: 35

Vraag 3

- 3.1.1 - Vleis ✓
- Olie en vette ✓
- Suiker ✓

Merk slegs eerste DRIE

(3)

- 3.1.2 - Suiker, olie en vette het 'n hoë energie (kJ) inhoud ✓✓/
- hoë cholesterol en olie en vet in vleis ✓✓/artereosklerose
- wat kan lei tot oormassa ✓✓/ wanvoeding
- asook hartsiektes ✓✓
- diabetes / suikersiekte

Merk slegs eerste EEN

Enige 1 x 2 (2)

- 3.1.3. - vrugte ✓
- aartappels ✓
- graanprodukte ✓
- ander groentes ✓

Merk slegs eerste DRIE

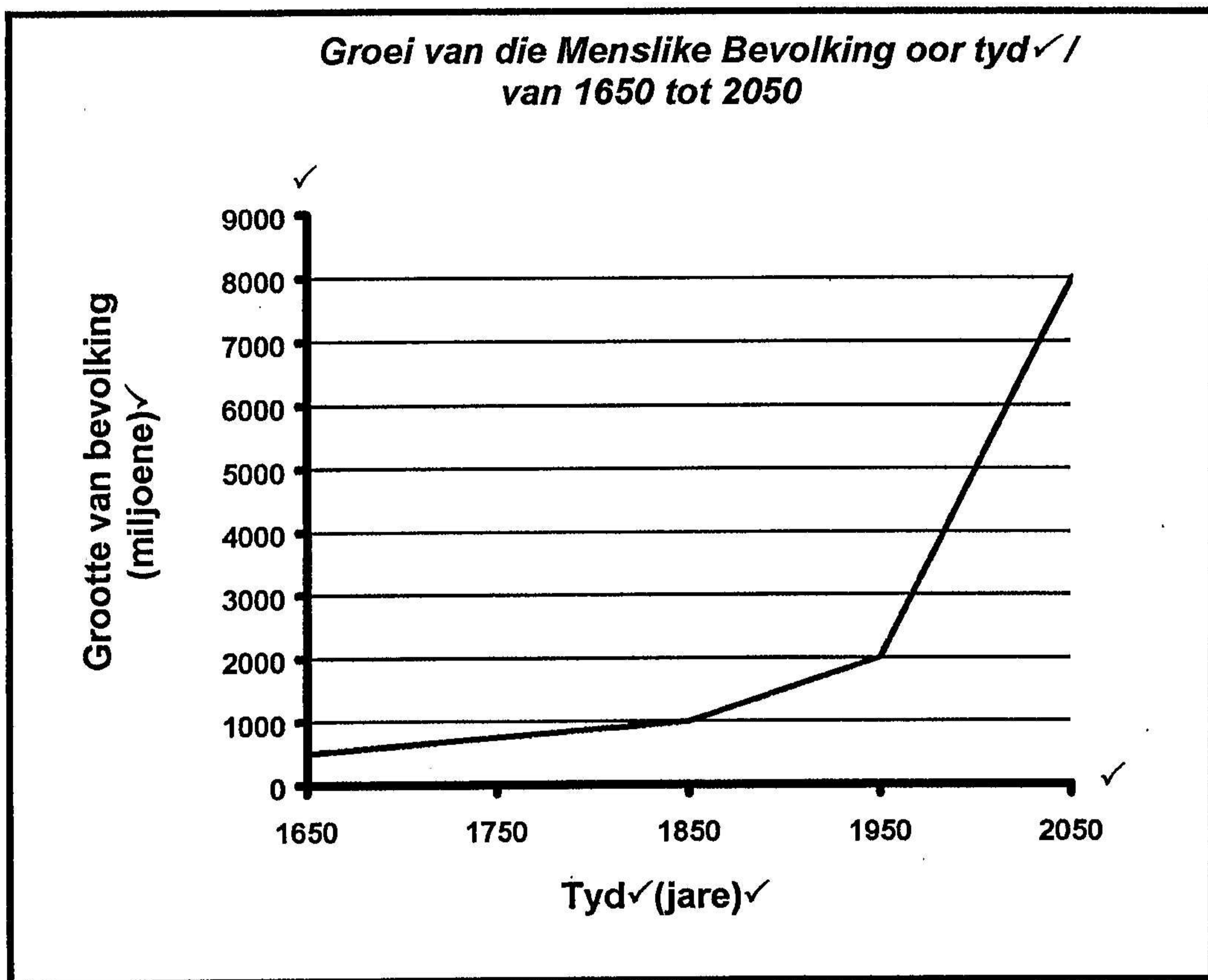
(3)

- 3.1.4 - Hierdie voedsel het 'n hoë ✓ruvesel ✓inhoud /
- wat 'n lae ✓energie (kJ) ✓inhoud het /
- Ruvesel ✓is belangrik vir peristaltiese bewegings ✓
- en dit voorkom ✓kanker in die kolon ✓
- Besit 'n hoë ✓vitamien / minerale inhoud ✓

Merk slegs eerste EEN

Enige 1 x 2 (2)
(10)

3.2.1



Rubriek om die grafiek te merk

▪ Keuse en opskrif van Asse	Onafhanklike veranderlike X; Afhanklike veranderlike Y	1 1
▪ Eenhede vir Asse	X-As Y-As	1 1
▪ Skaal	Naastenby. Nie noodwendig die herhaling van data vir die:	
	X As	1
	Y As	1
▪ Plot van punte	Korrek – Al 5 punte 3 of 4 punte 1 of 2 punte Geen	-3 -2 -1 -0
▪ Verbinding van punte		1
▪ Opskrif		1

(11)

LET WEL: As 'n kolomgrafiek geteken is, sal leerders punte verloor vir keuse en opskrif van asse en vir verbinding van punte. Krediteer ander aspekte indien korrek.

3.2.2 eksponensieel / geometries / J – kromme

(1)

Kopiereg voorbehou

- 3.2.3 - afname in die mortaliteitstempo ✓
- toename in die nataliteit ✓ van 'n bevolking
- verbeterde gesondheidsdienste ✓/
- verbeterde kwaliteit van voeding ✓
- min of geen omgewingsweerstand ✓
(Merk slegs eerste TWEE) 2 x 1 (2)
- 3.2.4 (i) 5 000 miljoen ✓✓ (reeks: 3 500 – 5 500) / 5 biljoen ✓✓
Vir waardes buite reeks lees vanaf die kandidaat se grafiek (2)
- (ii) 200 ✓ jaar ✓ (2)
- 3.2.5 (i) skattings ✓/ projeksies / deur die huidige / vorige
groeipatroon te verleng / deur ekstrapolering (1)
- (ii) - beplanning ✓
- bestuur ✓/ ontwikkeling/benutting van hulpbronne/ voedselproduksie
- beskerming en bewaring van natuurlike hulpbronne ✓
- ontwikkeling noodafleweringsprogramme ✓, soos die
- verspreiding van hulpbronne ✓ en bewusmakingsveldtogte
(Merk slegs eerste TWEE) 2 x 1 (2)
- (iii) - HIV/Vigs epidemie ✓
- tekort aan voedsel (hongersnood) ✓
- verwarming van aarde ✓
- besoedeling ✓
- oorloë ✓
- armoede ✓
- natuurrampe ✓
(Merk slegs eerste TWEE) 2 x 1 (2)
- (iv) - geboortebeperkings- (gesinsbeplanning) ✓ strategieë /laer fekunditeit
- verbeterde voedselproduksie ✓
- werkskepping ✓
- toename in voorsiening van energie ✓/ water
- verbeterde mediese tegnologie ✓
- verbeterde opvoeding (onderwys) ✓ /seksvoorligting
- volhoubare doeltreffende benutting van hulpbronne ✓
(Merk slegs eerste TWEE) 2 x 1 (2)
(25)

Totaal Vraag 3: 35

Vraag 4

- 4.1.1 A - brongiole ✓ /atrium /vestibulum / buis van alveolus/ opening/ ingang na alveolus/ rigting waarin lug vloei
B - wand ✓ van alveolus / epiteel / endoteel
C - rooibloedselle ✓ / eritrosiete (3)

- 4.1.2 diffusie ✓ / gaswisseling (1)

- 4.1.3 - '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

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

- 4.1.4 - X ✓ (1)

- gedeoksigineerde bloed /gelaai met koolstofdioksied in die vorm van bikarbonaate ✓ vloei vanaf die hart ✓ /longslagaar /pulmonêre arterie/ liggaamselle/ X /
na die longe ✓ deur na Y vir uitskeiding

Enige (2)

- 4.1.5 - 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)
(15)

- 4.2.1 Die tempo van asemhaling was hoër ✓ toe atmosferiese lug ingeasem is ✓
OF
 Die tempo van asemhaling was laer ✓ toe slegs suurstof ingeasem is ✓
OF
 Tussen 2,5 en 5 minute ✓ neem die tempo van asemhaling af ✓
OF
 Hoe hoër die O₂ konsentrasie ✓ hoe laer ✓ is die tempo van asemhaling
OF
 Hoe laer die O₂ konsentrasie ✓ hoe hoër ✓ is die tempo van asemhaling
 enige 1 x 2 (2)
- 4.2.2 - as gevolg van 'n toename in die tempo van aërobiese respirasie ✓ in die selle
 - styg die vlak van koolstofdioksied ✓
 - omdat die tempo van asemhaling laer is met slegs suurstof ✓
 - akkumuleer ✓ koolstofdioksied in die bloed ✓
 - omdat minder verwyder word ✓
 - as gevolg van 'n laer tempo van gaswisseling ✓ in die alveolus
 - Meer CO₂ ✓ word opgeneem wanneer atmosferiese lug ✓ ingeasem word
 (**Merk slegs die eerste TWEE** 2 x 2 (4)
- 4.2.3 * melksuuris 'n produk van anaërobiese respirasie ✓*
 - 'n Hoër tempo ✓ anaërobiese respirasie van vind plaas in die teenwoordigheid ✓
 van 'n laer suurstofkonsentrasie ✓ (atmosferiese lug)
OF
 - 'n Laer tempo ✓ van anaërobiese respirasie geskied in die teenwoordigheid ✓
 van 'n hoër suurstofkonsentrasie ✓
 ✓ x 3 (4)
- 4.2.4 - Anaërobiese respirasie ✓ sal slegs plaasvind as O₂ opgebruik is ✓
OF
 - Melksuur word in die spiere ✓ gevorm en neem daarom 'n tyd om in
 die bloed in te diffundeer ✓ (2)
- 4.2.5 - die tempo van asemhaling neem af ✓ wanneer suiwer suurstof ✓ ingeasem word
 - a.g.v. 'n hoër suurstofkonsentrasie ✓ of 'n lae koolstofdioksiedkonsentrasie ✓
OF
 - die tempo van asemhaling verhoog ✓ wanneer atmosferiese lug ✓ ingeasem word
 - a.g.v. 'n laer suurstofkonsentrasie ✓ of 'n hoër koolstofdioksiedkonsentrasie ✓
 Maksimum 3 x 1 (3)
- 4.2.6 - Uitgeasemde lug bevat meer CO₂ / minder O₂ ✓ / verhoog die suurstof tekort /
 uitgeasemde lug sal ook ander gasse behalwe suurstof bevat
 - tydens die ondersoek moet hierdie faktore / veranderlikes gekontroleer word ✓ (2)
- 4.2.7 - 'n Onfikse atleet sal nie baie diep asemhaal nie ✓
 - sal daarom vinniger asemhaal ✓
 - daarom sal meer CO₂ in die alveolus ophoop (akkumuleer) ✓
 - daarom sal melksuur gouer akkumuleer ✓
 Enige 3 x 1 (3)
(20)

Totaal Vraag 4: 35
TOTAAL AFDELING B: 105

AFDELING C

Vraag 5

5.1.1 Om te bepaal of lewendige organismes (plante/diere) CO₂ ✓ tydens respirasie ✓ vrystel

(2)

5.1.2

A	B	C
Niks gebeur ✓ / geen verandering / bly rooi	Geel ✓	Geel ✓

**Geen matrikslyne is nodig nie. Kolomme en tye word verwag.
1 punt vir tabel**

(4)

5.1.3 Kontrole ✓ / om te verifieer dat organismes verantwoordelik is vir die vrystelling van koolstofdiksied

(1)

5.1.4 Om die invloed van fotosintese ✓ op die resultaat uit te skakel ✓

(2)

5.1.5 - Die koolstofdiksied wat tydens respirasie vrygestel word dien as 'n grondstof vir die proses van fotosintese ✓
- Die energie ✓ wat tydens respirasie vrygestel word, is noodsaaklik vir die lewensaktiwiteite van die dier
- Handhaaf 'n balans tussen O₂ - en CO₂ -vlakke ✓
(Merk slegs eerste TWEE)

(2)

5.1.6 (i) - As die hoeveelheid CO₂ wat deur die slak vrygestel word dieselfde is ✓
- as die hoeveelheid wat deur die plante opgeneem ✓ tydens fotosintese
- sal die indikator rooi kleur ✓

OF

- As die hoeveelheid CO₂ wat deur die slak vrygestel word minder ✓
- as die hoeveelheid wat deur die plante opgeneem ✓ tydens fotosintese sal die indikator pers kleur ✓

OF

- Die hoeveelheid CO₂ wat deur die slak vrygestel word is minder ✓
- as die hoeveelheid wat deur die plante opgeneem ✓ tydens fotosintese
- sal die oplossing geel kleur

Enige 3 x 1

(3)

(ii) - Die resultaat sal dieselfde bly ✓ / geen verandering vind plaas
- hoë vlak van CO₂ ✓ sal vrygestel omdat die organisme steeds respireer ✓
- gevolglik sal die oplossing geel kleur ✓

Enige 3 x 1

(3)
(17)

5.2 Ligfase ✓

- Vind plaas in die granums / kwantosome / tilakoïede ✓ van
 - die chloroplas ✓
 - Stralingsenergie ✓ word
 - geabsorbeer deur die chlorofill molekules ✓ en
 - omgeskakel na potensiële chemiese energie ✓
 - Die energie word gebruik om:
 - water ✓ te splits in / fotolise
 - waterstof ✓ en
 - suurstof ✓
 - ATP te vorm ✓ / fotofosforilasie
 - Suurstof word vrygestel ✓ in die atmosfeer en
 - die energierike waterstof verbind met 'n koënsiem / NADP ✓
- Maks. (9)**

Donkerfase ✓ / Calvinsiklus / Lig-onafhanklike fase

- Vind plaas in die stroma ✓
- Koolstofdiksied ✓ vanaf die atmosfeer
- verbind ✓ met die waterstof ✓ wat tydens die ligfase gevorm is
- gebruik ook die energie van die ATP van die ligfase ✓
- om koolhidrate te vorm ✓, bv.
- glukose ✓ / stysel
- reaksies word deur ensieme beheer ✓

Maks. (6)

(15)

Punteskaal vir die assessering van die aanbieding van die mini-opstel

Punt	Assesseringskriteria
0	Geen poging aangewend/ antwoord in vloediagram
1	Groot leemtes in die logiese en vloei van die antwoord
2	Klein leemtes in die logiese en vloei van die antwoord
3	Goed gestruktureerd – toon insig en begrip van die vraag

LET WEL: As 'n vloediagram gegee word, merk soos in bostaande maar leerders sal punte vir aanbieding verloor.

(3)

**Totaal Vraag 5: 35
TOTAAL AFDELING C: 35
GROOTTOTAAL: 200**