

BIOLOGY HIGHER GRADE

POSSIBLE ANSWERS FOR:

PAPER ONE

SECTION A

QUESTION 1

1.1

1.1.1 A

1.1.2 D

1.1.3 A or D

1.1.4 C

1.1.5 B

1.1.6 B

1.1.7 C 7 x 2 [14]

1.2

1.2.1 Iodine

1.2.2 Pellagra

1.2.3 iodine (solution)/potassium iodide

1.2.4 co-enzymes

1.2.5 stroma

1.2.6 Krebs cycle/citric acid cycle/Tricarboxylic cycle

1.2.7 amino acids

1.2.8 anorexia (nervosa)

1.2.9 turbinates

1.2.10 migration

(10 x1) [10]

1.3

1.3.1 C

1.3.2 A

1.3.3 B/I

1.3.4 I

1.3.5 D/H

5 X 2 [10]

1.4

1.4.1 A

1.4.2 Y

1.4.3 D

1.4.4 C

4 x 2 = [8]

1.5

1.5.1 - oranges(1) / guava(1)/ spinach any 2

1.5.2 - egg yolk(1)

1.5.3 - wholewheat bread / spinach/cane sugar/ grapes/ oranges/guava/carrots (1)

1.5.4 - cane sugar/grapes/oranges/guavas any 2

1.5.5 - carrots(1)/spinach(1)/ egg yolk(1) any 2

(2)

(1)

(1)

(2)

(2)

[8]

1.6

1.6.1 To investigate the effect of different pH(1) concentrations on enzyme/pepsin activity(1) (2)

1.6.2 To closely resemble the temperature(1) conditions in the human body/ normal body temperature (1)/ optimum temperature (1) (1)

1.6.3 no change in S(1) / Q - whitish /S clear (1)

1.6.4 (i) - serves as a control / comparison(1) (1)

(ii) - provides an alkaline(1) medium/base medium/increase pH to become alkaline (1)

1.6.5 stomach(1) (1)

1.6.6 Q(1) (1)

1.6.7 clear / colourless / same as Q(2) (2)

[10]

TOTAL SECTION A : [60]

SECTION B

QUESTION 2

- 2.1.1 – prevents food from entering the trachea when swallowing / prevents choking / allowing food to enter oesophagus only / close glottis(1) (1)
- 2.1.2 (i) - peristalsis / churning of food(1) (1)
- (ii) - mixes the contents of the stomach(1) /facilities food through stomach
- facilitates mechanical digestion(1)
- facilitates chemical digestion(any 1)
- pushes food through stomach to intestine any 1 (1)
- (iii) - by the mucus/ mucus lining which lines the stomach(1) (1)
- 2.1.3 B (1) ONLY LETTER (1)
- 2.1.4 - duodenum / small intestine / ileum / jejunum(1) (1)
- 2.1.5 – it facilitates the easy(1) passage/movement of food/bolus(1) into the stomach/
- lubricates the passage for movement of food (2)
- 2.2.1 - it has a single layer(1) of columnar epithelial cells thus presenting a thin surface(1) for efficient absorption
- among the columnar cells are goblet cells(1) which secretes mucus(1) to facilitate absorption
- in the core of the villus is the lacteal(1) to absorb fatty acids(1)
- the lacteal is surrounded by a network of capillaries(1) to absorb amino acids and glucose(1) / close contact to transport food
- a large number(1) of villi provides an increased surface area(1) for absorption
- it projects into the lumen(1) thus making direct contact(1) with food for easier absorption
- villi are fingerlike projections(1) increase surface area (1)
- columnar epithelial cells have microvilli (1)which increases surface area(1) for absorption
- large number of mitochondria(1) for active absorption / absorption against concentration gradient
any (3 x 2) (6)
- 2.2.2 - the main end-product of potato digestion is glucose / monosaccharide(1)
- the glucose is absorbed by the villi
- by diffusion / along diffusion gradient/ high to low concentration
- against(1) a concentration gradient
- that is, they are actively(1) absorbed, using energy
- carrier molecules(1) may be involved
- the glucose then enters the blood capillaries(1)
- through the columnar epithelium(1) any 6 (6)
- 2.3.1 (i) - increases (1) concentration of blood glucose (1)
- (ii) - increases (1) and then decreases (1)
- 2.3.2 - an increased concentration of insulin results(1)
- in a decreased concentration of blood glucose(1)
- due to glucose being converted to glycogen(1)
- stimulates absorption of glucose by muscle cells(1)
- increases oxidation of glucose (1)
- inhibits conversion of glycogen to glucose (1) any 3 (3)

- 2.3.3 (i) - it increases the reliability of the results(1)
 - since one person may not be typical/ ideal(1) (2)
- (ii) - could lead to incorrect results(1) (2)
 - and invalid conclusions(1) (2)
- 2.3.4 1 hour (2) (2)
- 2.3.5 20(1) ug per cm³ (1)
- 2.3.6 - during exercise the rate of respiration/metabolism increases(1)
 - glucose is the fuel(1) for respiration / used during respiration/oxidised
 - the glycogen that is stored in the liver is converted to glucose(1)
 - by glucagon (1) any 3 (3)
- [15]**
- TOTAL : [35]**

QUESTION 3

- 3.1
- 3.1.1 8 (2) % (2)
- 3.1.2 10 – 14 (2) years (2)
- 3.1.3 2,5 – 3 (1) % (1)
- 3.1.4 - females(1) (1)
- 3.1.5 - pyramid B(1) (1)
- 3.1.6 - fewer offspring produced(1) / lower birth rate
 - more individuals reaching old age / life span improves (1)
 - fewer deaths in the young / medical intervention / social services/ higher income(1)
 - better quality food (1) any 2 (2)
- 3.2 (i) - intraspecific competition occurs between individuals of the
 same species(1)
 - interspecific competition occurs between individuals of different
 species (1) which have similar ecological requirements (2)
- (ii) - density–dependent factors that regulate population size are
 internal factors eg diseases etc and are directly related to the size(1)
 of the population
 - density–independent factors are external physical factors eg floods, etc
 independent of the population density(1) (2)
- (iii) - a predator is an animal that hunts /captures(1) and quickly kills
 other animals for its food
 - that animal which is killed (1)by the predator is referred to as the prey (2)
- [8]**

3.3.2 logistic / Sigmoid / S-shaped (1)

(1)

3.3.3 4900 – 5000 (2)

(2)

3.3.4 2,4 – 2,6 hours(2)

(2)

3.3.5 - the number of bacteria increased(1) rapidly(1)/natality increases (1)
- because of favourable(1) growth conditions eg. sufficient food
- and little or no limiting factors(1) any 3

(3)

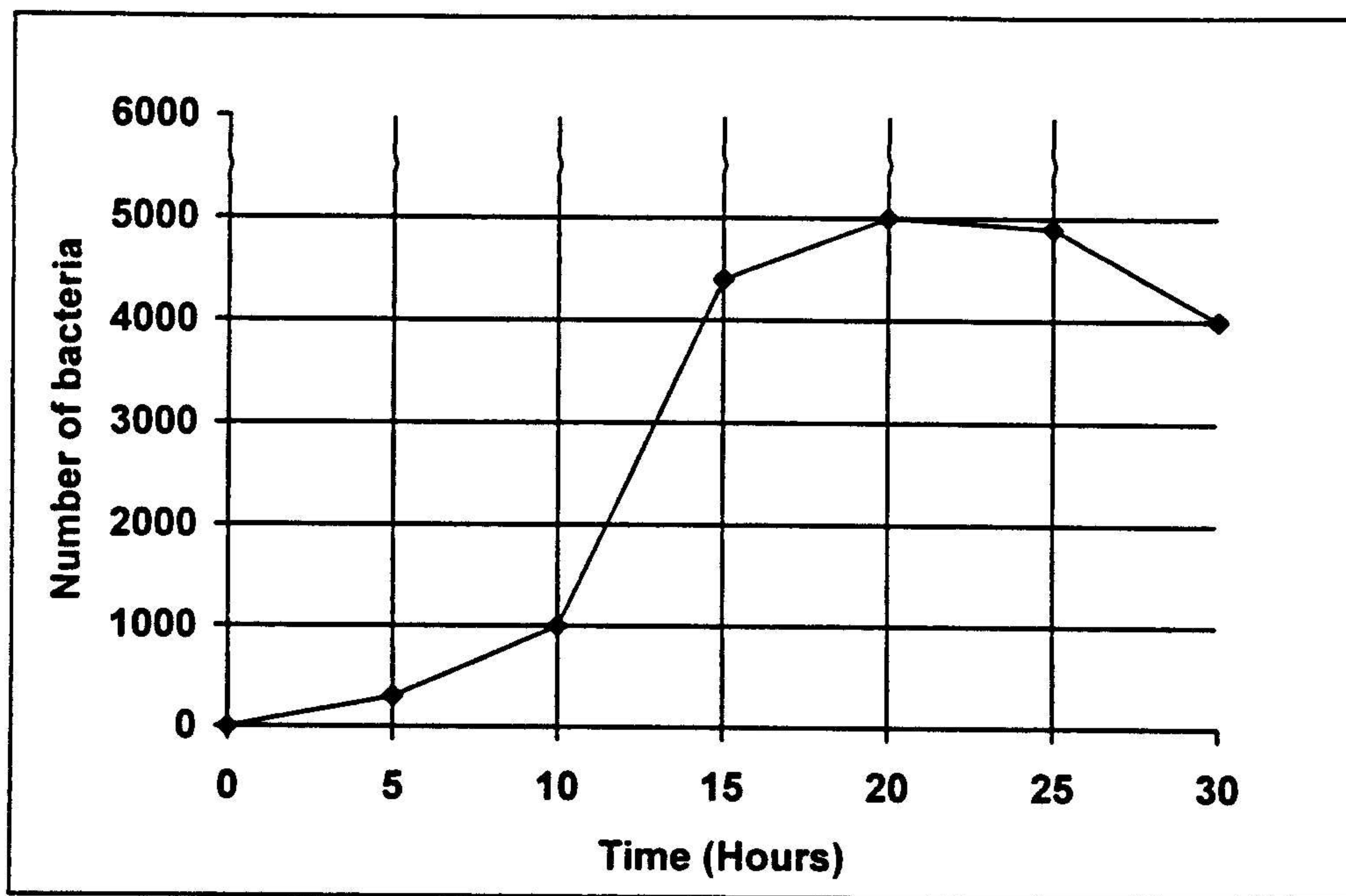
3.3.6 - competition for food / space/ water(1)
- depletion of food / oxygen / space / water(1)
- habitat may become degraded /environmental resistance/ unfavourable conditions/
carrying capacity exceeded (1)
- mortality increases(1) any 2

(2)

[20]

TOTAL : [35]

3.3
3.3.1



axes(2), title of axes(2), + any 5 for plotting + 1 for joining points

(10)

If the scale on the Y-axis is not correct, candidates will only lose the 5 marks for plotting

QUESTION 4

4.1

4.1.1 - anaerobic(1) respiration(1) / alcoholic(1)fermentation(1) (2)

4.1.2 (i) 34 - 36 (1) cm³ (1)(ii) 59 - 61 (1) cm³ (1)4.1.3 - carbon dioxide / CO₂(1) (1)4.1.4 - the water bath for B is at 30⁰C(1)

- this provided optimum growth conditions(1) for the yeast

OR

- gas production(1) increased(1)

OR

- increased temperature(1) resulted in increased respiration(1)

OR

- temperature in A is lower (1) poor growth conditions (1) and rate of respiration drops (1)
/less enzyme activity (1) therefore less CO₂

OR

- temperature in B is higher (1) better growth conditions (1) rate of respiration increases (1)
/more enzyme activity (1) therefore more CO₂ (1)

any 1 x 2 (2)

4.1.5 - glucose(1)

4.1.6 (1)

glycolysis	oxidative phosphorylation
<ul style="list-style-type: none"> - pyruvic acid produced - independent of oxygen/anaerobic - takes place in the cytosol - very little/ 2 ATP produced - hydrogen released - ATP used 	<ul style="list-style-type: none"> - water produced - requires oxygen to proceed/ aerobic - takes place in the mitochondria/cristae - a large amount/ 36 ATP is produced - hydrogen carried - ATP not used

any 2 pairs : (2 x 2) (4)

4.2.1 To investigate the effect of different light intensities/ the effect of temperature(1) on the rate(1) of photosynthesis (2)

OR

To investigate the effect of light on photosynthesis (1)

OR

To investigate the effect of light intensity on production of bubbles (1)

4.2.2 - oxygen(1) (1)

4.2.3 - gases diffuse(1) from the water directly(1) into the cells of the plant because
- the leaves are very thin (1)
- absence of cuticle(1)

max (2)

- 4.2.4 - KHCO_3 is a source of carbon dioxide(1)
 - it will increase (1) the rate of bubble/oxygen production(1) / photosynthesis
 - beyond a certain amount of KHCO_3 bubble production is reduced / dies (1)
 any (3)
- 4.2.5 - with a decrease(1) in the distance between the plant and the lamp(1)
 - there was an increase in bubble production(1)
 - thus indicating an increase (1) in the rate of photosynthesis (4)
 (accept vice versa) [12]
- 4.3.1 - 470 - 480 (2) (2)
- 4.3.2 - 50(2) (2)
- 4.3.3 - the plant uses most(1) carbon dioxide(1) at this height
 - for photosynthesis(1)
 - most(1) of the plant body occurs here / most leaves present (2)
 - rate of photosynthesis higher than rate of respiration at this level (1)
 - therefore less CO_2 (1) (3)
- 4.3.4 - the extra carbon dioxide is due to the respiration(1)
 - of soil organisms(1)
 - and roots of plants(1)
 - greater(1) number of organisms(1) at this level producing(1)
 - therefore more CO_2 (1)
 - rate of respiration higher than rate of photosynthesis (1)
 - density of CO_2 higher / heavy gas (1) (4)

[11]

TOTAL : [35]

QUESTION 5

5.1

5.1.1 Statement A(2) (2)

5.1.2 - different parts of the body react differently(2)

OR

- during exercise blood flow increases towards tissues and organs which are directly involved in exercise

OR

-blood flow to brain is constant (2)

OR

- or no common pattern(2)

OR

- decreased blood flow to kidneys, small intestine and other organs (2)

any 1 x 2

(2)

5.1.3 (i) 250 cm³ / min (1)

(1)

(ii) 350/750/ 1000 cm³ / min OR 350+750+1000/3 OR (350-1000)

(1)

(iii) 1000 cm³ / min (1)

(1)

5.1.4 - skeletal muscles(2)

(2)

5.1.5 - blood will flow away from the digestive system / blood to digestive system decreases (1)

digestion slows down/ less absorption(1)

thus resulting in cramps/pain in the stomach(1)

any 2 (2)

5.1.6 750 + 1900 + 750 + 12500 + 600 + 600 +400 (1) = 17500 cm³ / min(1)

OR

17500 / 7 (1) = 2500 (1) cm³/min

(2)

5.1.7 (i) - converted to lactic acid/ goes into Krebs cycle / oxidised(2)

(2)

(ii) - decreases / becomes more acidic(2)

(2)

[17]

5.2 (i) **Mechanism of breathing**

During inhalation	During exhalation
<ul style="list-style-type: none"> - External intercostal muscles contract - the diaphragm contracts - abdominal muscles relax - The volume of the thoracic cavity is increased - while the pressure inside the lungs decreases - air is drawn into lungs 	<ul style="list-style-type: none"> external intercostal muscles relax (1) diaphragm relaxes(1) contract (1) volume decreases(1) pressure increases(1) air is forced out (1)

6 marks either for inhalation or exhalation or a combination of both (6)

(ii) **Change in breathing rate**

- normal at the start/ faster because of pre-race anxiety(1)
- Rate of breathing increases with exercise (1)
- Rate continues to be high at recovery stage(1)

These changes are brought about by:

- increase in CO₂ / lower pH (1)
- detected by bodies in carotid arteries/aorta/medulla oblongata (1)
- impulses sent to medulla oblongata (1)
- message gets to respiratory muscles (including the abdominal muscles) (1)
- need for more oxygen for respiration (1)
- more energy is needed for the race (1)

any 6 (6)

(iii) **Recovery**

- oxygen uptake continues at a high rate(1)
- until all the lactic acid(1) has been oxidized(1)
- Thus the oxygen "debt" is paid off (1)
- by rapid breathing(1)

any 3 (3)

3 marks for synthesis to be distributed as follows:

MARKS	CRITERIA
3	most facts included and presented logically
2	most facts included but not presented logically
1	some facts only
0	very few facts

(3)
(18)

TOTAL : [35]

GRAND TOTAL : [200]

MOONTLIKE ANTWOORDE VIR:

BIOLOGIE HOËR GRAAD

VRAESTEL EEN – NOVEMBER 2002

AFDELING A

VRAAG 1

1.1	1.2			
1.1.1 A (2)	1.2.1 jodium (1)	1.2.6. Kresbssiklus/Sitroensuur-/ Trikarboksielsuursiklus (1)		
1.1.2 D (2)	1.2.2 pellagra (1)	1.2.7 aminosure (1)		
1.1.3 A /D(2)	1.2.3 jodiumoplossing/Kaliumjodiet (1)	1.2.8 anoreksia (nervosa) (1)		
1.1.4 C (2)	1.2.4 ko-ensieme (1)	1.2.9 Turbinaatbene/neusskulpe(1)		
1.1.5 B (2)	1.2.5 Stroma (1)	1.2.10 migrasie (1)		
1.1.6 B (2)				
1.1.7 C (2) (7 x 2) [14]			(10 x1)	[10]
1.3				
1.3.1 C				(2)
1.3.2 A				(2)
1.3.3 B/I				(2)
1.3.4 I				(2)
1.3.5 D/H				(2)
			5 X 2	[10]
1.4				
1.4.1 A (2)				(2)
1.4.2 Y (2)				(2)
1.4.3 D (2)				(2)
1.4.4 C (2)				(2)
				[8]
1.5				
1.5.1 – lemoene (1), koejawels (1), spinasie (1) Enige 2				(2)
1.5.2 – eiergeel (1)				(1)
1.5.3 – Enigeen in lys (1) (behalwe eiergeel)				(1)
1.5.4 – rietsuiker (1), druiwe (1), lemoene (1), koejawels (1) Enige 2				(2)
1.5.5 – geelwortels (1), spinasie (1), eiergeel (1) Enige 2				(2)
				[8]
1.6				
1.6.1 Om die uitwerking van verskillende pH (1) konsentrasies op ensiem-/pepsienaktiwiteit (1) te ondersoek				(2)
1.6.2 Om so na as moontlik te wees aan die liggaamstempertuur van die mens/ Optimumliggaamstemperatuur/Normale liggaamstemperatuur (1)				(1)
1.6.3 Geen verandering by S/ S is helder/Q is witterig (1)				(1)
1.6.4 (i) - dien as kontrole / vergelyking (1)				(1)
(ii) - om 'n alkaliese/basiese medium te skep/verhoog pH om alkalie te word (1)				(1)
1.6.5 maag (1)				(1)
1.6.6 Q (1)				(1)
1.6.7 helder/kleurloos/dieselfde soos Q (2)				(2)
				[10]

TOTAAL AFDELING A : [60]

AFDELING B

VRAAG 2

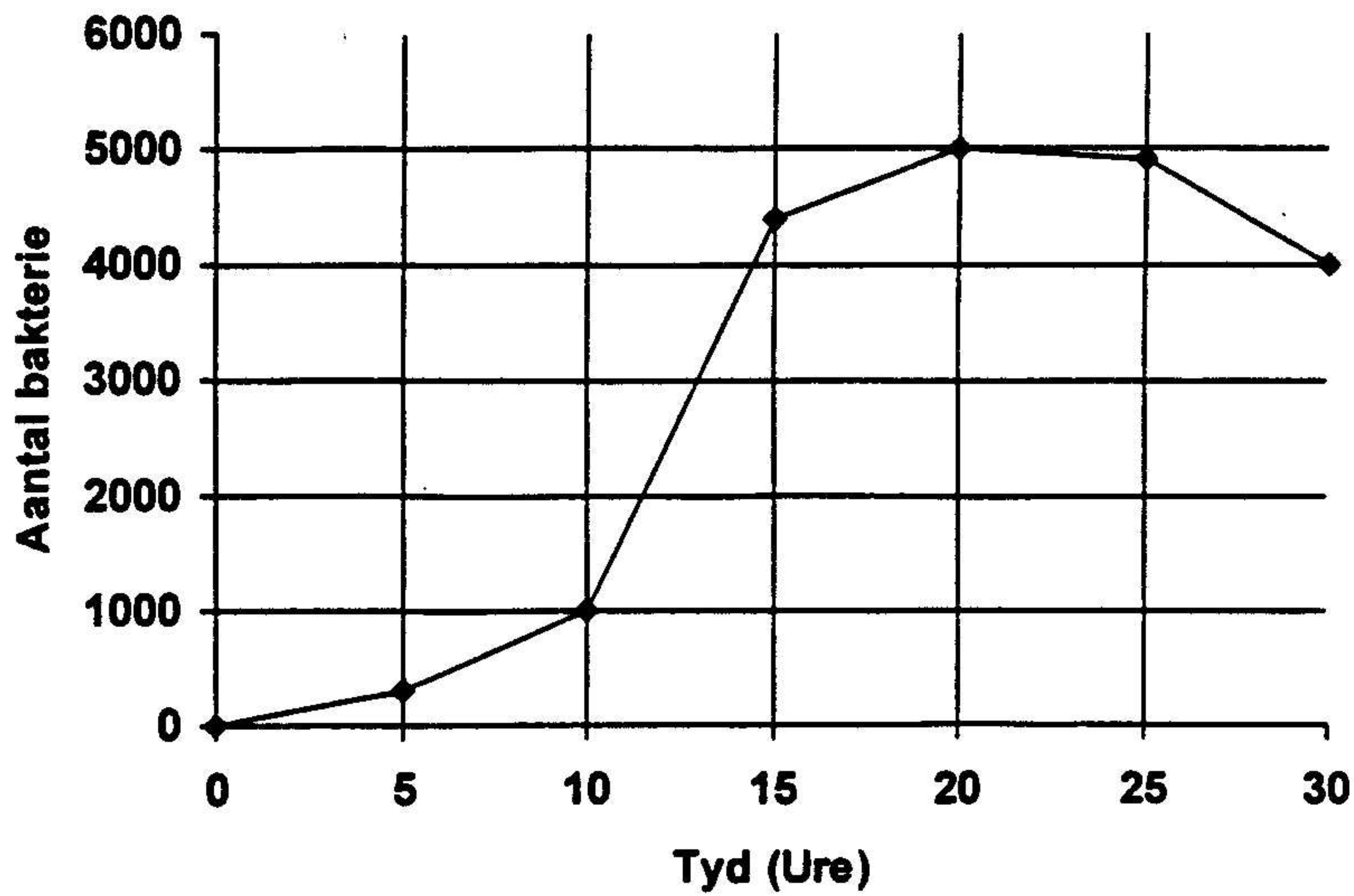
- 2.1.1 Voorkom dat voedsel die tragea binnedring wanneer gesluk word/ sluit lugpyp/
Laat voedsel slegs in slukderm beland/Voorkom verstikking(1) (1)
- 2.1.2 (i) - peristalse/karringbewegings (1) (1)
- (ii) - meng die maaginhoud/vergemaklik of help chemise vertering/stoot voedsel
na die dunderm/laat voedsel deur die maag beweeg/help met meganiese
vertering (1) (enige1) (1)
- (iii) - deur die slymvlies/slym wat die maag uitvoer (1) (1)
- 2.1.3 B (1) SLEGS LETTER (1)
- 2.1.4 - duodenum / dunderm / ileum / jejenum (1) (1)
- 2.1.5 - dit vergemaklik (1) vir voedsel-/bolusbeweging (1) na die maag/
- smeermiddel vir voedsel om deur te beweeg (2)
- 2.2.1 - enkellaag (1) kolomepiteelselle wat dit 'n dun oppervlak (1) gee vir effektiewe absorpsie
- bekarselle (1) tussen die kolomepiteelselle wat slym (1) afskei
om absorpsie te vergemaklik
lakteaal (1) in middel van villus bevat 'n limfvat om vetsure (1) te absorbeer
- die limfvat is omring met 'n netwerk bloedvate (1) om
aminosure en glukose (1) te absorbeer/ noue kontak vir vervoer van voedsel
- 'n groot aantal villi (1) voorsien 'n groot oppervlakte (1) vir absorpsie
- dit dring die lumen binne (1) en maak so noue kontak (1) vir maklike absorpsie van voedsel
- kolomepiteelselle het mikrovilli (1) wat oppervlakte vergroot (1) vir absorpsie
- groot aantal mitochondria (1) vir aktiewe absorpsie/absorpsie teen kons.gradiënt (1)
- villi is vingeragtig/gevou (1) vir grootabsorpsieoppervlakte
enige (3 x 2) (6)
- 2.2.2 - die hoofindproduk van aartappelvertering is glucose/monosakkeriede (1)
- wat deur diffusie/langs kons.gradiënt/van hoë na lae konsentrasie beweeg
- glukose word ook deur die villi
- teen die konsentrasiegradient geabsorbeer (1)
- hulle word dus aktief /deur gebruik van energie ge-absorbeer en (1)
- draer molekules (1) mag betrokke wees
- die glukose dring bloedkapillêres (1) binne
- deur kolomepiteel (1) enige 6 (6)
- 2.3
- 2.3.1 (i) - verhoog die konsentrasie van bloedglukose (1)
- (ii) - verhoog die glukose (1)
- 2.3.2 - 'n verhoogde insulienkonsentrasie (1) lei tot
- verlaagde konsentrasie van bloedglukose tot gevolg (1)
- agv die omskakeling van glukose na glikogeen (1)
- stimuleer absorpsie van glucose uit die bloed deur die spiere (1)
- stimuleer die oksidasie van glukose
- inhibeer omsetting van glikogeen na glucose enige 3 (3)
- 2.3.3 (i) - dit verhoog die betroubaarheid van die resultate (1)
- omdat een persoon nie tipies/ideaal mag wees nie (1) (2)
- (ii) - kan tot verkeerde resultate lei (1)

- en ongeldige gevolgtrekkings (1) (2)
 - 2.3.4 - 1 uur (2) (2)
 - 2.3.5 - 20(1) ug per cm³ (1)
 - 2.3.6 - tydens oefening versnel die tempo van respirasie/metabolisme (1)
 - glukose is die brandstof/word gebruik/geoksideer (1) vir respirasie
 - die glikogeen wat in die lewer gestoor is word na glucose omgeskakel (1)
 - deur glukagon (1) enige 3 (3)
- [15]**
- TOTAAL : [35]**

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VRAAG 3

- 3.1
 - 3.1.1 8% (2) (2)
 - 3.1.2 10 – 14 jaar (2) (2)
 - 3.1.3 2,5 – 3 % (1) (1)
 - 3.1.4 - vrouens (1) (1)
 - 3.1.5 - piramide B (1) (1)
 - 3.1.6 – minder nageslag word voortgebring/lae geboortetempo (1)
 - meer oumense/langer lewensduur (1)
 - minder sterftes by jonges /
 beter mediese dienste/hoër inkomste/beter maatskaplike dienste(1)
 - beter voedsel (1) enige 2 (2)
 - 3.2 (i) - intraspesifieke kompetisie kom voor tussen individue van dieselfde (1) spesie
 - interspesieke kompetisie tussen individue van verskillende (1) spesies met soortgelyke ekologiese vereistes (2)
 - (ii) - digtheid-afhanklike faktore wat die populasiegrootte reguleer is interne faktore wat direk by die grootte (1) van die populasie betrokke is/afhanklik is van populasiegrootte, bv siekte
 - digtheid-onafhanklike faktore is uitwendige fisiese faktore, bv vloede onafhanklik van die populasiegrootte bv vloede (1) (2)
 - (iii) - 'n predator is 'n dier wat ander diere jag/vang en vinnig doodmaak vir kos (1)
 - dier wat deur predator doogemaak (1) word is die prooi (2)
- [8]**

3.3



asse (2); benoeming van asse (2); enige 5 vir plot (5); as punte verbind word (1)
 Indeling op Y-as nie korrekte skaal: slegs punte vir plot verbeur (10)

- 3.3.2 logistiese/ S-vormige/sigmoïede (1) (1)
- 3.3.3 4900 - 5000 (2) (2)
- 3.3.4 2,4 – 2,6 ure (2) (2)
- 3.3.5 - die aantal bakterieë het vinnig (1)vermeerder(1)/nataliteit verhoog (1)
 - weens gunstige (1) groeitoestande eg. genoegsame voedsel
 - en min of geen beperkende (1) faktore enige 3 (3)
- 3.3.6 - kompetisie vir voedsel/ruimte/water (1)
 - vermindering van voedsel/suurstof/ruimte/water (1)
 - habitat mag gedegradeer word/omgewingsweerstand/dravermoë oorskry/
 ongunstige omgewingsfaktore(1)
 - mortaliteit vermeerder (1)

enige 2 (2)
[20]

TOTAAL : [35]

VRAAG 4

4.1

4.1.1 - anaerobiese (1) respirasie (1) /alkoholiese (1) fermentasie /gisting(1) (2)

4.1.2 (i) 34 - 36 cm³ (1) (1)

(ii) 59 - 61 cm³ (1) (1)

4.1.3 - koolstofdiksied/CO₂ (1) (1)

4.1.4 - die waterbad vir B is 30°C (1)

- dit het optimum groeitoestande (1) vir die gis voorsien

OF

- gasproduksie (1) het vermeerder (1)

OF

- toename in temperatuur (1) veroorsaak toename in respirasie (1)

OF

-temperatuur by A is laer (1) en skep swak groeitoestande (1)

tempo van respirasie neem af/ensiemaktiwiteit neem af (1) dus word minder CO₂ gevorm (1)

OF

- temperatuur by B is hoër (1) en skep beter groeitoestande (1)/

tempo van respirasie neem toe(1)/ensiemaktiwiteit neem toe (1)

dus word meer koolstofdiksied gevorm (1)

enige 2 x 1 (2)

4.1.5 - glukose (1)

(1)

4.1.6

Glikolise	Oksidatiewe fosforilasie
- onafhanklik van suurstof/anaerobies	- benodig suurstof om voort te gaan/aerobies
- vind plaas in sitosol	- vind plaas in mitokondrion /kristas
- baie min/2 ATP gevorm	- groot hoeveelheid/36 ATP is gevorm
- pirodruiwesuur is eindproduk	- water is eindproduk
- waterstof vrygestel	- waterstof oorgedra
- ATP gebruik	- ATP nie gebruik nie

enige 2 pare : (2 x 2)

(4)

[12]

4.2.1 Om die invloed van verskillende ligintensiteite/temperatuur (1) op die tempo (1) van fotosintese vas te stel

OF

Om die invloed van lig op fotosintese te bepaal (1)

OF

Om die invloed van ligintensiteit op die vorming van borrels te bepaal (1)

(2)

4.2.2 - suurstof (1)

(1)

4.2.3 - gase diffundeer/beweeg langs kons.gradiënt (1) direk (1)
in die selle van die plant want

- die blare is baie dun (1)

- kutikula is afwesig (1)

enige 2

(2)

4.2.4 - KHCO₃ is 'n bron van koolstofdiksied (1)

- dit sal die tempo verhoog (1)

- waarteen die blasies/suurstof gevorm word/van fotosintese (1)

- Bokant 'n sekere KHCO₃ word minder borrels gevorm (1) enige 3

(3)

- 4.2.5 - soos die afstand (1) tussen die plant en die lamp verminder (1)
 - was daar 'n toename in vorming van blasies (1)
 - wat die toename (1) in die tempo van fotosintese aandui (4)
 (aanvaar omgekeerde) [12]
- 4.3.1 - 470 – 480 (2) (2)
- 4.3.2 - 50 (2) (2)
- 4.3.3 – die plant gebruik meeste (1) van die koolstofdioksied (1) by hierdie hoogte
 - vir fotosintese (1)
 - grootste (1) gedeelte van die plant/blare kom hier (2) voor
 -fotosintese vind teen hoër tempo as respirasie plaas by hierdie punt (1)
 daarom word minder koolstofdioksied gevorm (1) (3)
- 4.3.4 – die ekstra koolstofdioksied is te wyte aan die respirasie (1)
 - van grondorganismes (1)
 - en wortels van plante (1)
 - groter (1) aantal organismes (1) by hierdie hoogte produseer (1)
 Koolstofdioksied is swaarder/digter gas (1) daarom meer CO₂ hier
 - tempo van respirasie hoer as tempo van fotosintese (1), dus meer CO₂ (1)
 enige 4(4)
 [11]
- TOTAAL : [35]**

AFDELING C

VRAAG 5

5.1

5.1.1 Stelling A (2)

(2)

5.1.2 - verskillende dele van die liggaam reageer verskillend (2)

OF

- tydens oefening bloedvloei neem toe na die weefsels en organe wat direk verwant is aan oefening (2)

OF

- bloedvloei na brein konstant (2)

OF

- of geen algemene patroon (2)

OF

- bloedvloei verminder na niere, spysverteringskanaal en ander organe (2)

5.1.3 (a) $250 \text{ cm}^3 / \text{min}$ (1)

(1)

(b) $350/750/1000 \text{ cm}^3 / \text{min}$ OR $350+750+1000/3$ OR (350-1000) (1)

(1)

(c) $1000 \text{ cm}^3 / \text{min}$ (1)

(1)

5.1.4 - skeletspiere (2)

(2)

5.1.5 - meeste van die bloed vloei weg van die verteringstelsel/

- bloedvloei na spysverteringskanaal verminder(1)/vertering vind stadiger plaas/ minder absorpsie (1)

- gevolglik ontstaan krampe/pyn in die maag (1)

(2)

5.1.6 $750 + 1900 + 750 + 12500 + 600 + 600 + 400$ (1) = $17500 \text{ cm}^3 / \text{min}$ (1)

(2)

OR

 $17500 / 7$ (1) = 2500 (1) cm^3/min (2)

5.1.7 (i) - omgeskakel na melksuur/ gaan na Krebsiklus/ geoksideer (2)

(2)

(ii) - verminder / word meer suur (2)

(2)

[17]

5.2 (i) Meganisme van asemhaling

Tydens asemhaling	Tydens uitaseming
<ul style="list-style-type: none"> - uitwendige tussenribspiere trek saam - die diafragma trek saam - abdominale spiere verslap - volume van borskas vergroot - druk verminder in longe - lug word ingeasem 	<ul style="list-style-type: none"> - uitwendige tussenribspiere verslap(1) - diafragma verslap(1) - abdominale spiere trek saam (1) - volume verminder(1) - druk verhoog (1) - lug is uitgeasem (1)

6 punte vir of insaeming of uitaseming of 'n kombinasie van beide (6)

(ii) Verandering in asemhalingstempo tydens die Wedloop

- normaal aan die begin /vinniger agv van angstigheid voor die wedloop(1)
- tempo van asemhaling neem toe(1)
- tempo neem steed toe tydens herstelperiode(1)

Hierdie veranderinge word teweeggebring deur:

- toename in CO₂ / laer pH(1)
- waargeneem deur liggaampies in nekslagare / aorta/medulla(1)
- impulse gaan na medulla oblongata(1)
- boodskappe gaan na asemhalingspiere (insluitende die abdominale spiere) (1)
- behoefte vir meer suurstof vir respirasie (1)
- meer energie benodig vir die wedloop (1) enige 6 (6)

(iii) Herstel Periode

- tempo van suurstofopname is hoog (1)
- totdat al die melksuur (1) geoksideer is (1)
- dus word die suurstoftekort aangevul (1)
- deur vinnige asemhaling (1)

Enige 3 (3)

3 punte vir samestelling soos volg versprei:

PUNTE	KRITERIA
3	meeste feite aangebied op 'n logies wyse
2	meeste feite aangebied maar nie logies uiteengesit
1	slegs sommige feite
0	baie min feite

(3)

[18]

TOTAAL : [35]