POSSIBLE ANSWERS
FEB / MARCH 2007

SECTION A

QUESTION 1

1.1.1 B✓✓

1.1.2 D✓✓

1.1.3 C✓✓

1.1.4 B✓✓

1.1.5 C✓✓

1.1.6 A✓✓

1.1.7 C✓✓

7 X 2 (14)

1.2.1 Haemoglobin✓

1.2.2 Pyloric valve✓

1.2.3 Vitamins✓

1.2.4 Alcoholic Fermentation✓

1.2.5 Lactic acid✓

1.2.6 Mastication✓

6 X 1 (6)

1.3.1 E✓✓

1.3.2 C✓✓

1.3.3 B✓✓

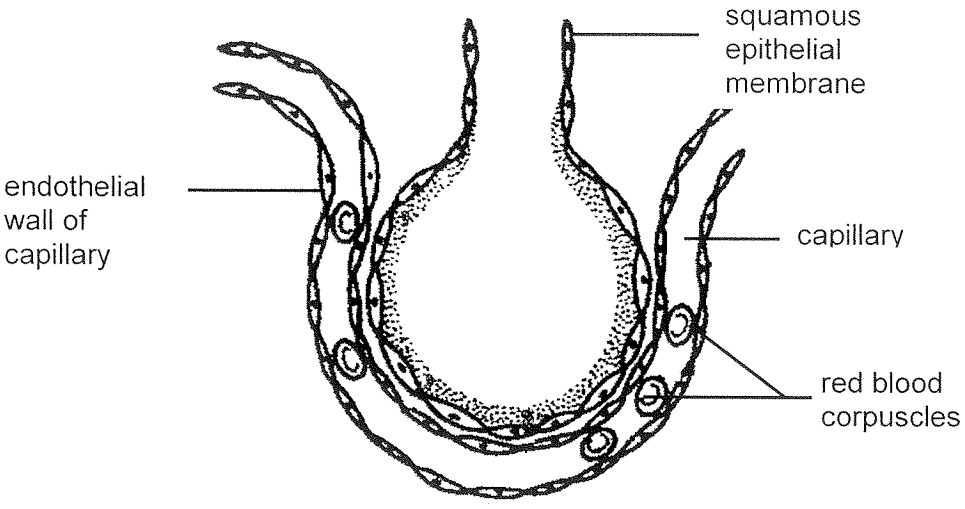
1.3.4 G✓✓

1.3.5 A✓✓

5 X 2 (10)

1.4.1	(a)	carbon dioxide✓		(1)
	(b)	light✓		(1)
	(c)	Chlorophyll✓		(1)
1.4.2	To absorb carbon dioxide✓			(1)
1.4.3	A✓			(1)
1.4.4	(a)	Blue black✓		(1)
	(b)	The green parts turn blue black ✓ and the white parts turn brown/ the colour of the iodine✓		(2)
				(8)
1.5.1	table salt✓ fish✓ ***(Mark first TWO only)***			(2)
1.5.2	margarine✓milk✓liver✓ ***(Mark first TWO only)***		Any 2 X 1	(2)
1.5.3	liver✓ spinach✓ egg white✓ ***(mark first TWO only)***		Any 2 X 1	(2)
				(6)

1.6



Transverse section through the alveolus with it's blood supply

Shape of alveolus = 1 mark *Proportion = 1 mark* *4 labels = 4 marks*

(6)

TOTAL SECTION A: **50**

SECTION B

QUESTION 2

2.1.1 catabolic✓ (1)

2.1.2 M/substrate✓ has been broken down✓to N and P (2)

2.1.3 Enzyme ✓ (1)

2.1.4 M is a substrate which is acted upon by an enzyme to form N and P✓. N and P can also be acted upon by an enzyme✓ to form M✓
Any 2 X 1 (2)

(6)

2.2.1 pH 6.9 to 7✓ (1)

2.2.2 3/three✓ minutes✓ (2)

2.2.3
- add a few drops of Benedict's reagent/ equal volumes of Fehling's A and Fehling's B solutions✓
- to the product solution in a test tube✓
- shake ✓thoroughly
- heat contents ✓carefully by constantly moving test tube over the flame
- orange-red colour✓ indicates the presence of glucose/reducing sugar

Any 3 X 1 (3)

2.2.4 Stomach✓pH is too low✓✓ (3)
(9)

2.3.1 A - transverse section through the small intestine✓ (1)
B - section through villi✓ (1)

2.3.2 intestinal juice/succus entericus✓ (1)

2.3.3 I - serosa✓ (1)
IV - columnar epithelium✓ (1)

2.3.4
- it is finger like✓to ensure maximum absorption of digested nutrients✓
- microvilli✓increase the surface area for absorption✓
- thin walled consisting of a single layer of columnar epithelial tissue✓ ensures easy diffusion of nutrients✓
- well supplied with blood capillaries and lacteals✓for efficient transport of absorbed nutrients✓

(Mark first TWO only) Any 2 X 2 (4)

2.3.5 Contracts and relaxes to move food/assists in peristalsis✓ (1)
(Mark first ONE only)

(10)
TOTAL QUESTION 2: **(25)**

QUESTION 3

3.1.1 (a) III✓ (1)
(b) I✓/ II✓ Any 1 x 1 (1)

3.1.2 (a) growth and development will be enhanced by this diet✓as the teenager is taking in enough foods containing proteins/ organic nutrient II✓ (2)

(b) energy requirements will be adequately met✓the teenager is taking in enough carbohydrates/organic nutrient I✓a lot of lipids and enough servings of food ✓as a whole to supply energy except for vegetables and fruits.
Any 2 X 1 (2)

(c) resistance to infections and diseases will be poor✓as the teenager is not taking in enough fruits and vegetables✓ lack of vitamins and mineral salts ✓
Any 2 X 1 (2)

3.1.3
- the teenager will become obese/gain weight✓
- have cholesterol accumulating in the arteries✓
- which might cause heart disease/heart attacks✓

Any 2 X 1 (2)

3.1.4 I - carbohydrate✓ (1)
II - protein✓ (1)

3.1.5
- Reserve source of energy✓
- Is a structural component of cell membranes✓
- Acts as an insulating layer/conserves heat in the body✓
- Protects delicate organs✓

(Mark first THREE only) Any 3 X 1 (3)

(15)

3.2.1 (a) 85 (range 84 - 86) ✓ arbitrary units✓ (2)

(b) 65 (range 63 – 66) ✓arbitrary units✓ (2)

3.2.2 the rate of photosynthesis is higher in green leaves✓ than in variegated leaves✓ /the rate of photosynthesis is lower in variegated leaves✓than in green leaves✓ (2)

3.2.3 the green leaves have more chloropyll /variegated leaves have less chlorophyll✓therefore green leaves absorb more light/variegated leaves absorb less light✓
(Mark first ONE only) (2)

3.2.4 - radiant energy is converted into chemical potential energy/energy is stored✓
- oxygen is released ✓into the air which is used for cellular respiration
- carbon dioxide is absorbed from the air✓
(Mark first TWO only) Any 2 X 1 (2)

(10)

TOTAL QUESTION 3: (25)

QUESTION 4

4.1.1 To investigate whether germinating✓seeds release heat✓ during cellular respiration✓

Any 2 X 1 (2)

4.1.2 Flask A

- (the thermometer in the flask containing germinating seeds)
- shows an increase in temperature✓
- indicating that the germinating seeds are respiring✓ and therefore releasing heat✓

Flask B
- the thermometer (in the flasks with boiled seeds) shows no change in temperature✓
- because seeds are dead / not respiring✓
- so heat is not released✓

Any 4 X 1 (4)

4.1.3 (a) Inverted flask allows carbon dioxide to escape✓because carbon dioxide is heavier than air✓which if allowed to accumulate will slow down respiration✓

Any 2 X 1 (2)

(b) to provide moisture ✓ for the germination of the seeds✓ (2)

(c) to sterilize✓ the seeds and flasks and to prevent growth of micro organisms /fungi and bacteria✓ which can also release energy in form of heat and affect the results. ✓

Any 2 X 1 (2)

4.1.4
- rubber stopper will prevent carbon dioxide from escaping/oxygen from entering ✓✓
- accumulation of carbon dioxide in the flask will slow down/stop the process of respiration ✓✓
- decrease in temperature as respiration decreases or stops✓✓

Any 1 x 2 (2)

(14)

4.2.1 (a) Inhaling/inhalation/inspiration✓ (1)
(b) Exhaling/exhalation/exspiration✓ (1)

4.2.2
- the diaphragm relaxes✓
- the external intercostals muscles relax✓
- abdominal muscles contract✓

Any 2 X 1 (2)

4.2.3 The diffusion of gases/oxygen and CO_2✓ through a membrane between a cell and its environment/along the concentration gradient / from high concentration to low concentration✓ (2)

4.2.4
- at Y carbon dioxide diffuses out of the body cells✓ through
- the tissue fluid into the blood✓
- this deoxygenated blood travels through the pulmonary artery ✓to the lungs
- at the alveoli the carbon dioxide diffuses out of the blood✓ into the alveolus✓
- some of the carbon dioxide dissolves in the blood plasma✓
- some combine with the haemoglobin of the red blood cells to form carbaminohaemoglobin✓
- and the rest is carried as bicarbonate ions✓

Any 5 X 1 (5)

(11)

TOTAL QUESTION 4: (25)

QUESTION 5

5.1.1 The study of the changes in the number of organisms within a population✓ and the factors that influence those changes✓ (2)

5.1.2 Factors affecting the growth of a population✓ which is not dependent on the current density of that population✓/ natural disasters✓ affecting population growth✓

Any 2 X 1 (2)

5.1.3 Competition between individuals of the same species✓ for the same limited resource✓

Any 2 X 1 (2)
(6)

5.2.1 Predation/predator- prey relationship✓ (1)

5.2.2
- When the size of the prey /impala population increases✓
- the predator/leopard population also rises✓
- because of increased food supply✓
- resulting in increased mortality of prey /impala✓ through predation
- the prey /impala population drops✓
- causing predators/leopards to emigrate / die✓
- and predator/leopard population also drops✓

Any 5 X 1 (5)

5.2.3 (a) 470 - 480✓✓ (2)
(b) 220 - 230✓✓ (2)

5.2.4 (a) 600✓✓ (2)
(b) 390✓✓ (2)

5.2.5 1999✓✓ (2)

5.2.6 325✓ – 100 ✓ = 225✓ leopards (3)
(19)

TOTAL QUESTION 5: (25)

AFDELING A

VRAAG 1

1.1.1 B✓✓

1.1.2 D✓✓

1.1.3 C✓✓

1.1.4 B✓✓

1.1.5 C✓✓

1.1.6 A✓✓

1.1.7 C✓✓

7 x 2 (14)

1.2.1 Haemoglobien✓

1.2.2 Pilorusklep✓

1.2.3 Vitamiene✓

1.2.4 Alkoholiese Fermentasie✓

1.2.5 Melksuur✓

1.2.6 Mastikasie✓

6 x 1 (6)

1.3.1 E✓✓

1.3.2 C✓✓

1.3.3 B✓✓

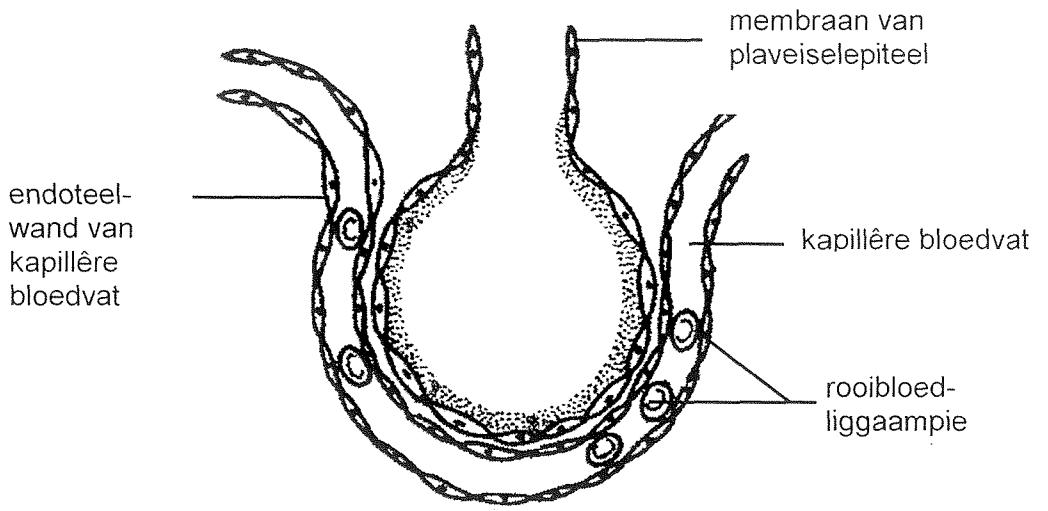
1.3.4 G✓✓

1.3.5 A✓✓

5x 2 (10)

1.4.1	(a)	koolstofdioksied✓		(1)
	(b)	lig✓		(1)
	(c)	Chlorofil✓		(1)
1.4.2	Om koolstofdioksied te absorbeer✓			(1)
1.4.3	A✓			(1)
1.4.4	(a)	Blou-swart✓		(1)
	(b+)	Die groen dele verander na blou-swart ✓ en die wit dele kleur bruin/ die kleur van jodiumoplossing✓		(2)
				(8)
1.5.1	tafelsout✓ vis✓ ***(Merk slegs eerste TWEE)***			(2)
1.5.2	margariene✓melk✓lewer✓ ***(Merk slegs eerste TWEE)***		Enige 2 X 1	(2)
1.5.3	lewer✓ spinasie✓ eierwit✓ ***(Merk slegs eerste TWEE)***		Enige 2 X 1	(2)
				(6)

1.6



Lengtesnit deur die alveolusmet sy bloedvoorsiening

Vorm van *alveolus = 1 punt* *Verhouding = 1 punt* *4 byskrifte = 4 punte*

(6)

TOTAAL AFDELING A: 50

AFDELING B

VRAAG 2

2.1.1 katabolies✓ (1)

2.1.2 M/substraat✓ is afgebreek ✓tot N en P (2)

2.1.3 Ensiem ✓ (1)

2.1.4 M is `n substraat waarop `n ensiem inwerk om N en P✓ te vorm. N en P kan ook deur `n ensiem ✓ beïnvloed word om M ✓te vorm
Enige 2 X 1 (2)

(6)

2.2.1 pH 6.9 tot 7✓ (1)

2.2.2 3/drie ✓ minute✓ (2)

2.2.3
- voeg `n paar druppels Benedict oplossing by/ eweveel van Fehling's A en Fehling's B oplossings✓
- tot die produk in oplossing in `n proefbuis✓
- skud ✓deeglik
- verhit inhoud ✓versigtig deur die proefbuis
- aanhoudend oor die vlam te beweeg
- oranje–rooi kleur✓ dui die teenwoordigheid van glukose/reduserende suikers aan

Enige 3 X 1 (3)

2.2.4 Maag ✓pH is te laag✓✓ (3)

(9)

2.3.1 A - lengtesnit deur die dunderm✓ (1)
B – snit deur die villus✓ (1)

2.3.2 dermsap/succus entericus✓ (1)

2.3.3 I - serosa✓ (1)
IV - kolomepiteel✓ (1)

2.3.4
- dit is vingeragtig✓om maksimum absorpsie van verteerde voedingstowwe ✓te verseker
- microvilli✓vergroot die absorpsie-oppervlak✓
- dun wande bestaan uit `n enkellaag van kolomepiteel weefsel✓ vergemaklik diffusie van voedingstowwe✓
- goed voorsien van bloedkapillêres en lakteaal vate✓ vir effektiewe vervoer van geabsorbeerde voedingstowwe✓

(Merk slegs eerste TWEE) Enige 2 X 2 (4)

2.3.5 Treksaam en verslap om voedsel voort te beweeg/help met peristalsis✓ (1)
(Merk slegs eerste EEN)

(10)

VRAAG 3

3.1.1 (a) III✓ (1)
(b) I✓/ II✓ Any 1 x 1 (1)

3.1.2 (a) groei en ontwikkeling sal deur die dieet bevorder word ✓as die tiener genoeg voedsel wat proteiene bevat eet/ organiese voedingstofI II✓eet (2)

(b) energie vereistes sal voldoende ✓vir die tiener wees indien hy genoeg koolhidrate/organiese voedingstof I✓ eet `n groot hoeveelheid lipiedes en voldoende porsies van voedsel✓ as `n geheel om energie te skaf behalwe vir groente en vrugte (2)
Enige 2 X 1

(c) weerstand teen infeksies en siektes sal swak wees✓ omdat die tiener nie genoeg vrugte en groente eet nie✓ gebrek aan vitamienes en minerale soute ✓ (2)
Enige 2 X 1

3.1.3 - die tiener sal vetsug ontwikkel / oorgewig raak✓
- cholesterol sal in die arterieë versamel✓
- wat hartsiektes/hartaanvalle sal veroorsaak✓
Enige 2 X 1 (2)

3.1.4 I - koolhidrate✓ (1)
II - proteïene✓ (1)

3.1.5 - Reserwe energiebron✓
- Is `n strukturele komponent van selmembrane✓
- Dien as `n isoleerlaag/bewaar liggaamshitte✓
- Beskerm delicate organe✓
(Merk slegs eerste DRIE) Enige 3 X 1 (3)

(15)

3.2.1 (a) 85 (reeks 84 - 86) ✓ arbitrêre eenhede✓ (2)

(b) 65 (reeks 63 – 66) ✓ arbitrêre eenhede✓ (2)

3.2.2 die tempo van fotosintese is hoër in groen blare✓ as in gevlekte blare✓/die tempo van fotosintese is laer in gevlekte blare ✓as in groen blare✓ (2)

3.2.3 die groen blare het meer chlorofil /gevlekte blare het minder chlorofil ✓daarom groen blare absorber meer lig/ gevlekte blare absorber minder lig ✓
(Merk slegs eerste EEN) (2)

3.2.4 - stralingsenergie word omgeskakel in chemies potensiële energie/ energie word gestoor✓
- suurstof word vrygestel ✓in die lug wat wat gebruik word vir selkrespirasie
- koolstofdioksied word uit die atmosfeer geabsorbeer✓
(Merk slegs eerste TWEE) Enige 2 x 1 (2)

(10)

TOTAAL VRAAG (25)

VRAAG 4

4.1.1 Om te ondersoek of ontkiemende✓sade warmte✓ tydens sellulêre respirasie✓ vrystel

Enige 2 X 1 (2)

4.1.2 Fles A

- (die termometer in die fles wat die ontkiemende sade bevat)
- toon dat die temperatuur styg✓
- wat aandui dat ontkiemende sade respireer✓ en daarom hitte vrystel✓

Fles B
- die termometer (in die fles met gekookte sade) toon geen verandering in temperatuur✓
- omdat die sade dood is / nie respireer nie✓
- daarom word hitte nie vrygestel nie✓

Enige 4 X 1 (4)

4.1.3 (a) Omgekeerde fles laat koolstofdioksied toe om te ontsnap ✓ omdat koolstofdioksied swaarder as lug is✓wat indien dit toegelaat word om op te hoop, respirasie sal laat afneem✓

Enige 2 X 1 (2)

(b) om vog ✓ vir die ontkieming van sade✓te voorsien (2)

(c) om sade en fles te steriliseer✓en om die groei van mikro-organismes/fungi en bakterieë✓te voorkom wat ook energie in vorm van hitte kan vrystel en die resultate✓ beïnvloed (2)

Enige 2 X 1

4.1.4
- rubberprop sal voorkom dat koolstofdioksied ontsnap/suurstof binnekom✓✓
- ophoping van koolstofdioksied in die fles sal die proses van respirasie laat afneem/stop✓✓
- afname in temperatuur as respirasie afneem of stop✓✓

Enige 1 x 2 (2)

(14)

4.2.1 (a) Inaseming/inhalasie/inspirasie✓ (1)
(b) Uitaseming/ekshalasie/ekspirasie✓ (1)

4.2.2
- die diafragma ontspan✓
- die uitwendige tussenribspiere ontspan✓
- abdominale spiere trek saam✓

Enige 2 X 1 (2)

4.2.3 Die diffusie van gasse/suurstof en CO_2✓ deur 'n membraan tussen 'n sel en sy omgewing/saam met 'n konsentrasiegradiënt / van 'n hoë konsentrasie na 'n lae konsentrasie✓ (2)

4.2.4
- by Y diffundeer koolstofdioksied uit die liggaamselle uit✓ deur
- die weefselvloeistof tot in die bloed✓
- hierdie gedeoksigineerde bloed beweeg d.m.v. die longslagaar✓na die longe
- by die alveolus diffundeer koolstofdioksied uit die bloed✓ tot in die alveolus✓
- sommige van die koolstofdioksied los in die bloedplasma op✓
- sommige verbind met die hemoglobien van die rooibloedselle om karbaminohemoglobien te vorm✓
- en die res word as bikarbonaatione vervoer✓

Enige 5 X 1 (5)

(11)

TOTAAL VRAAG 4: (25)

VRAAG 5

5.1.1 Die studie van die veranderinge in die getalle van organismes in 'n bevolking✓en die faktore wat hierdie veranderinge✓teweegbring (2)

5.1.2 Faktore wat die groei van 'n bevolking beïnvloed✓ wat nie van die huidige digtheid van daardie bevolking afhanklik is nie✓/ natuurlike rampe✓wat bevolkingsgroei beïnvloed✓

Enige 2 X 1 (2)

5.1.3 Kompetisie tussen individue van dieselfde spesie✓ vir dieselfde beperkte bron✓

Enige 2 X 1 (2)

(6)

5.2.1 Predasie/predator- prooi verwantskap✓ (1)

5.2.2
- Wanneer die grootte van die prooi /rooibokbevolking toeneem✓
- sal die predator/luiperdbevolking ook toeneem✓
- a.g.v. 'n toename in voedsel wat voorsien word✓
- wat die mortaliteit van die prooi-/rooibokbevolking✓a.g.v. predasie tot gevolg het
- die prooi /rooibokbevolking neem af✓
- wat veroorsaak die predatore/luiperd emigreer / sterf✓
- en die predator/luiperdbevolking neem ook af✓

Enige 5 X 1 (5)

5.2.3 (a) 470 - 480✓✓ (2)
(b) 220 - 230✓✓ (2)

5.2.4 (a) 600✓✓ (2)
(b) 390✓✓ (2)

5.2.5 1999✓✓ (2)

5.2.6 325✓ – 100 ✓ = 225✓luiperde (3)

(19)

TOTAAL VRAAG 5: (25)