GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PREPARATORY EXAMINATIONS

2016

MEMORANDUM

LIFE SCIENCES (SECOND PAPER) (10832)

13 pages

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

LIFE SCIENCES
(Second Paper)

MEMORANDUM

PRINCIPLES RELATED TO THE MARKING OF LIFE SCIENCES

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 are incorrect, do not credit. If sequence and links become correct again, resume credit.

9. **Non-recognised 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 recognisable accept provided it does not mean something else in Life Sciences or if it is out of context**.**

13. **If common names given in terminology.**
Accept provided it was accepted at the memo discussion meeting.

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. **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.

19. No changes must be made to the marking memoranda without consulting the provincial internal moderator.

SECTION A

QUESTION 1

1.1	1.1.1	A✓✓		
	1.1.2	B✓✓		
	1.1.3	A✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	A✓✓		
	1.1.7	A✓✓		
	1.1.8	D✓✓		
	1.1.9	D✓✓		
	1.1.10	D✓✓		
			(10x2)	**(20)**
1.2	1.2.1	Nucleus ✓		
	1.2.2	Fossil ✓		
	1.2.3	Gene ✓		
	1.2.4	Prognathus ✓		
	1.2.5	Dentition ✓		
	1.2.6	Homozygous / true breeding / pure bred✓		
	1.2.7	Quadrupedal ✓		
	1.2.8	Non-disjunction✓		
			(8x1)	**(8)**
1.3	1.3.1	B only ✓✓		
	1.3.2	A only ✓✓		
	1.3.3	A only ✓✓		
	1.3.4	B only✓✓		
			(4x2)	**(8)**
1.4	1.4.1	All the males can be the father / No males can be excluded ✓		(1)
	1.4.2	Male 3 ✓		(1)
	1.4.3	(a) ii ✓		(1)
		(b) I^Ai ✓		(1)
	1.4.4	(i) ✓and (iv) ✓		(2)
				(6)

1.5	1.5.1	nucleus✓		(1)
	1.5.2	8 ✓		(1)
	1.5.3	AGC ✓		(1)
	1.5.4	Translation✓		(1)
	1.5.5	(a)	ribosome✓	(1)
		(b)	tRNA / transfer RNA ✓	(1)
	1.5.6	6✓		(1)
	1.5.7	UAG ✓		(1) **(8)**

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 A mutation is a sudden unexpected change in the genetic structure of a cell.✓ (1)

2.1.2 Gene mutation ✓ (1)

2.1.3
- Gene mutations affect a single or a few base pairs in the single gene.✓
- the base sequence CTT is changed to CAT ✓
- which produces a different polypeptide ✓

Any 2 (2)

2.1.4 (a) Glutamic acid✓ (1)

(b) Valine ✓ (1)
(6)

2.2
- Each tRNA carries a specific amino acid✓
- When the anticodon of the tRNA✓
- Matches the codon on the mRNA✓
- The tRNA brings the required amino acid to the ribosome✓
- Amino acids become attached by peptide bonds✓
- To form the required polypeptide / protein✓ **(6)**

2.3 2.3.1 (a) Egg size frequency / Graph B ✓ (1)

(b) Blood group / type frequency / Graph A ✓ (1)

2.3.2 **Discontinuous variation example = Blood Groups**.
- individuals fall into a number of distinct categories ✓
- is based on features that cannot be measured across a complete range ✓
- You either have the characteristic or you don't. ✓
- The environment has little effect on this type of variation ✓

Any 2 (2)

Continuous variation example = Egg size frequency.
- shows a variation with a complete range of measurements✓
- from one extreme to the other. ✓
- the eggs can have a complete range of weight ✓
- often significantly affected by environmental influences, such as food quality and diet, weather, comfort of their surroundings. ✓

Any 2 (2)
(6)

2.4 2.4.1 The antibiotic is effective✓ in destroying all bacteria✓
The antibiotic is not effective ✓in destroying all bacteria✓
The antibiotic is more/ less effective ✓on certain bacteria / bacteria A/B/C✓ (2)

2.4.2 Growth of bacteria ✓ (1)

2.4.3 The antibiotic is most effective on Bacteria A ✓and partially effective on Bacteria B ✓but not effective against bacteria C ✓
Any 2 (2)

2.4.4
- Same amount of antibiotic used
- Same size agar plate/ surface area✓
- Same concentration / strength of antibiotic✓
- Same type of agar✓
- Same amount of bacteria applied to agar✓

(MARK first TWO only) **Any 2** (2)

2.4.5
- wearing gloves
- keeping plates sealed
- washing up/ sterilisation
- correct disposal

(MARK first ONE only) **Any 1** (1)

2.4.6
- repeat the investigation✓
- increase sample size ✓

(MARK first ONE only) **Any 1** (1)

2.4.7
- There is a great deal of variation✓ in bacteria population
- antibiotics are used it kills off large number of bacteria ✓
- Some bacteria have a characteristic / mutation that makes them resistant to the antibiotic✓
- this is called natural selection✓
- The bacteria that survived reproduce✓
- and pass on the favourable characteristics / resistance to antibiotic to their offspring✓
- The next generation has a higher proportion of individuals with the favourable characteristics / resistance✓
- increases population of resistant bacteria ✓

Any 5 (5)
(14)

2.5 2.5.1
- Results in genetically identical offspring ✓
- Reduces biodiversity of species gene pool✓
- Amplification of “good” or “bad” genes✓ (2)

2.5.2
- Produce superior livestock to reproduce more rapidly ✓
- As market changes livestock can be bred to respond to market changes and demands ✓
- Promote commercial crops that reproduce quickly✓
- Producing fruit and vegetable varieties to extend shelf life of fresh produce✓
- Allows less wastage of food and transport costs✓

(MARK first TWO only) **Any 2** (2)
(4)

2.6

2.6.2 **Difference**
- Darwin - evolution takes place where species undertake gradual changes that occur over a long period of time. ✓
- punctuated equilibrium - evolution involves long periods of time where species do not change and then during short periods of time rapid changes occur. ✓

OR

Difference
- Darwin - after a long period of time new species evolve that are different from their ancestors. ✓
- punctuated equilibrium - new species are formed in a short period of time, relative to the long periods of no change. ✓

OR

Difference
- Darwin - supported by many transitional fossils in the fossil record which show the progressive change over time✓
- punctuated equilibrium - supported by the absence of transitional fossils indicating the period of rapid change✓

(MARK first TWO only) **Any 2 differences** **(4)**
[40]

QUESTION 3

3.1 3.1.1 (a) Only seen in males / not in females ✓ (1)

(b) unaffected mother / parents yet they have a son that has colour-blindness✓ (1)

3.1.2 (a) 5 = $X^{d}Y$ ✓

(b) 7 = $X^{D}X^{d}$ ✓ <u>AND</u> $X^{D}X^{D}$ ✓

(c) 8 = $X^{D}X^{d}$ ✓ (4)

3.1.3

P_1/parent phenotype Normal male x Normal female ✓
genotype $X^{D}Y$ x $X^{D}X^{d}$ ✓
Meiosis
G/gametes X^{D} , Y x X^{D} ; X^{d} ✓

Fertilisation ✓✓

F_1/ offspring genotype $X^{D}X^{D}$; $X^{D}X^{d}$; $X^{D}Y$; $X^{d}Y$✓

phenotype 2 normal females and 1 normal male, 1 affected male✓
***25% or 1 in 4** ✓

Parents and offspring✓/P_1 and F_1
Meiosis and fertilisation✓ **Any 5 + 1*(Compulsory)**

OR

P_1/parent phenotype Normal male x Normal female ✓
genotype $X^{D}Y$ x $X^{D}X^{d}$ ✓
Meiosis
G/gametes X^{D} , Y x X^{D} ; X^{d} ✓

Fertilisation

Gametes	X^{D}	Y
X^{D}	$X^{D}X^{D}$	$X^{D}Y$
X^{d}	$X^{D}X^{d}$	$X^{d}Y$
	✓✓	

F_1/ offspring genotype $X^{D}X^{D}$; $X^{D}X^{d}$; $X^{D}Y$; $X^{d}Y$✓

phenotype 2 normal females and 1 normal male, 1 affected male✓
***25% or 1 in 4** ✓

Parents and offspring✓/P_1 and F_1
Meiosis and fertilisation✓ **Any 5 + 1*(Compulsory)** (6)
(12)

3.2 3.2.1 Dihybrid cross ✓ (1)

3.2.2 Both are black and round ✓✓ (2)

3.2.3 bbRR✓ AND bbRr ✓ (2)

3.2.4 BR: Br: bR; br ✓✓ (2)

3.2.5 9:3:3:1 ✓✓
OR
9 black and round
3 ✓ black and wrinkled ✓
3 yellow and round
1 yellow and wrinkled
(2)
(9)

3.3 3.3.1 (a) A = 3 ✓ (1)

(b) B = 2✓ (1)

3.3.2

Feature	**African Apes**	**Humans**
Cranial ridge	Ridge present✓	Ridge not present/ absent✓
Spine	Less curved spine / (C-shaped spine)✓	More curved spine / (S-shaped spine)✓

(4)

3.3.3
- entire skeletons seldom found ✓
- soft parts missing due to decay✓
- must presume nature of individual from limited evidence✓
- difficulty in dating fossils✓

Any 2 (2)

3.3.4 (a) organisms that show the intermediate states between an ancestral form and that of its descendants / some of the traits of both / species which actually link two groups / intermediate between two groups ✓ (2)

(b) The position of the foramen magnum changes ✓
from a backward position✓ to a forward position ✓in the cranium / skull. ✓
Results in species changes from being quadripedal✓ / walking on all fours to becoming bipedal✓ / walking upright **/** standing erect **Any 3** (3)
(13)

3.4

- A population of frogs become split ✓ by a geographical barrier / **mud bank***
- As a result, the two parts of the population cannot interbreed. ✓
- There is no gene flow✓ between the two populations.
- Natural selection occurs independently✓ in each population
- due to different environmental conditions✓ on either side of the river.
- As a result, the two populations become genotypically and phenotypically different✓over a period of time.
- Even if the mud bank is removed, the frogs will not be able to interbreed again. ✓
- One or both parts of the frog population have become a new species✓.

Any 5 + 1*(Compulsory) **(6)**

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Meiosis

Crossing – over ✓
- occurs in Prophase 1✓
- involves the exchange of genetic material between homologous chromosomes ✓
- Leads to new combinations so that each gamete formed will have a mix of genes from maternal and paternal parents✓
- Brings about variation in the gametes ✓formed
- Variation in the offspring ✓

Max 5

Random arrangement of chromosomes ✓
- During **Metaphase I** ✓
- Each pair of homologous chromosomes ✓
- line up either way / randomly on the equator of the spindle ✓
- this allows different combinations of chromosomes to separate into the new cells ✓
- During **Metaphase – II** ✓
- individual chromosomes ✓
- line up either way / randomly on the equator of the spindle ✓
- this allows different combinations of chromatids to separate into the new cells ✓
- Brings about variation in the gametes formed

Max 4

Mutations
- Change in the structure of gene ✓or chromosome ✓
- Changing the organisms genotype ✓
- Since genotype influences the phenotype, ✓
- new organisms formed ✓
- with new / different characteristics ✓
- occur through generations / from one generation to next ✓

Max 4

Chance fertilisation
- Random fertilisation between different egg cells and sperm cells ✓
- formed by meiosis ✓
- Result in offspring that are different from each other ✓

Max 2

Random Mating
- Random mating between organisms within a species ✓
- Leads to different set of offspring being produced from each different mating pair✓

Max 2

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic.	Ideas are arranged in a logical / cause-effect sequence.	All aspects required by the essay have been sufficiently addressed.
In this essay	Only information relevant to: - crossing over - random arrangement - mutation - chance fertilisation - random mating	The description of: - crossing over, - random arrangement, - mutations, - chance fertilisation, - random mating, given are logical and sequential.	At least correct points included: - crossing over (3/5) - random arrangement (2/4) - mutations (2/4) - chance fertilisation (1/2) - random mating (1/2)..
Mark	1	1	1

TOTAL SECTION C: 20

TOTAL: 150

ASSESSERING VAN DIE OPSTEL AANBIEDING

Kriteria	Relevansie (R)	Logiese volgorde (L)	Volledigheid (C)
Algemeen	Alle inligting gegee wat relevant is ten opsigte van die onderwerp	Idees gerangskik in 'n logiese volgorde / oorsaak-effek orde	Alle aspekte wat in die opstel vraag genoem is, is suksesvol gedek
In hierdie opstel	Slegs inligting relevant t.o.v.: - oorkruising - onafhanlkike sortering - mutasies - ewekansige / willekeurige bevrugting - willekeurige paring	Die beskrywing van: - oorkruising - onafhanlkike sortering - mutasies - ewekansige / willekeurige bevrugting - willekeurige paring is logies en opvolgend.	Korrekte punte sluit in: - oorkruising (3/5) - onafhanlkike sortering (2/4) - mutasies (2/4) - ewekansige / willekeurige bevrugting (1/2) - willekeurige paring (1/2)
Punt	1	1	1

TOTAAL AFDELING C: 20

TOTAAL: 150

AFDELING C

VRAAG 4

Meiose
Oorkruising ✓
- Vind plaas in Profase I✓
- Sluit in die uitruiling van genetiese materiaal tussen homoloë chromosome ✓
- Lei tot nuwe kombinasies sodat elke gameet wat gevorm word 'n mengsel van gene sal hê van moederlike en vaderlike (ouers) oorsprong ✓
- Bring variasie in gevormde gamete✓
- Bring variasie in nakomelinge ✓

Maks 5

Onafhanklike sortering van chromosome ✓/ **Willekeurige rangskikking van chromosome**
- Gedurende **Metafase I** ✓
- Sal elke paar homoloë chromosome
- willekeurig / lukraak / onafhanklik rangskik op die spoeldraad by die ewenaar
- dit laat verskillende kombinasies van chromosome in die nuwe selle toe ✓
- Gedurende **Metafase – II** ✓
- sal individuele chromosome ✓
- willekeurig rangskik op die spoeldraad by die ewenaar ✓
- dit laat verskillende kombinasies van chromatiedes in die nuwe selle toe ✓
- Dit bring variasie voor in gamete wat vorm

Maks 4

Mutasies
- Verandering in die struktuur van 'n geen✓ of 'n chromosoom ✓
- Verandering in die organisme se genotipe ✓
- Genotipe beïnvloed die fenotipe, ✓
- nuwe organismes vorm ✓
- met nuwe / verskillende eienskappe ✓
- vind plaas deur generasies / van een generasie na die volgende ✓

Maks 4

Ewekansige / willekeurige bevrugting
- ewekansige / willekeurige bevrugting tussen verskillende eierselle en spermselle✓
- gevorm deur meiose ✓
- Lei tot nakomelinge wat verskillend is van mekaar ✓

Maks 2

Willekeurige paring
- Willekeurige paring tussen organismes van 'n spesie ✓
- lei tot 'n verskillende stel nakomelinge wat geproduseer word van elke verskillende broeipaar ✓

Maks 2

3.4

- ’n Populasie paddas word verdeel ✓ deur ’n geografiese versperring / **modderbank***
- Dit het tot gevolg, dat die twee dele van die bevolking nie kan inteel nie. ✓
- Daar vind geen geenvloei ✓plaas tussen die twee bevolkings nie.
- Natuurlike seleksie vind onafhanklik ✓plaas in elke bevolking.
- As gevolg van verskillende omgewingstoestande✓ aan weerskante van die rivier.
- Die twee bevolkings word genotipies en fenotipies verskillend✓oor tyd.
- Selfs indien die modderbank verwyder word, sal die paddas nie meer kan inteel nie. ✓
- Een of beide dele van die padda bevolkings het ’n nuwe spesie gevorm.✓

Enige 5 + 1*(Verpligtend) **(6)**

[40]

TOTAAL AFDELING B: 80

3.2 3.2.1 Dihibriede kruising ✓ (1)

3.2.2 Beide swart en rond ✓✓ (2)

3.2.3 bbRR✓ EN bbRr ✓ (2)

3.2.4 BR: Br: bR; br ✓✓ (2)

3.2.5 9:3:3:1 ✓✓

OF

9		swart en rond	
3	✓	swart en gerimpeld	✓
3		geel en rond	
1		geel en gerimpeld	

(2)

(9)

3.3 3.3.1 (a) A = 3 ✓ (1)

(b) B = 2✓ (1)

3.3.2

Eienskap	**Afrika aap**	**Mens**
Skedelrif	Rif teenwoordig✓	Rif nie teenwoordig nie / afwesig✓
Werwelkolom	Minder gebuig / gekromde werwelkolom / (C-vormige werwelkolom)✓	Meer gebuig / gekromde werwelkolom (S-vormige werwelkolom)✓

(4)

3.3.3
- volledige skelet word min gevind ✓
- sagte dele vermis as gevolg van ontbinding✓
- moet aard van individue aanneem as gevolg van beperkte bewyse ✓
- moeilik om fossiele te dateer✓

Enige 2 (2)

3.3.4 (a) organismes wat die intermediêre/oorgang bepaal tussen ’n voorvaderlike vorm van sy afstammelinge / sommige eienskappe van beide / spesies wat regtig twee groepe verbind / oorgang tussen twee groepe organismes ✓ (2)

(b) Die posisie van die foramen magnum verander ✓
van ’n meer agtertoe posisie✓ na ’n voorentoe posisie ✓in die kranium / skedel. ✓
Resultate in spesies verander van viervoetig✓ / loop op al vier om bipedaal(tweevoetig) ✓ te word / om regop te loop/ regop te staan **Enige 3** (3)

(13)

VRAAG 3

3.1 3.1.1 (a) Slegs by mans / Nie by vrouens ✓ (1)

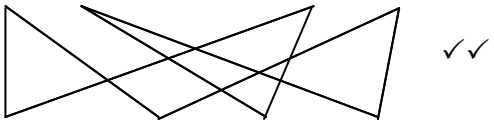
(b) ongeaffekteerde ma / ouers het alreeds 'n kleurblinde seun✓ (1)

3.1.2 (a) 5 = X^dY ✓

(b) 7 = X^DX^d ✓ EN X^DX^D ✓

(c) 8 = X^DX^d ✓ (4)

3.1.3

P_1/ouers	Fenotipe	Normale man x Normale vrou ✓
	Genotipe	X^DY x X^DX^d ✓
	Meiose	
	G/gamete	X^D , Y x X^D ; X^d ✓
	Bevrugting	 ✓✓
F_1/ nakomelinge	Genotipe	X^DX^D ; X^DX^d ; X^DY ; X^dY✓
	Fenotipe	2 normale vrouens en 1 normale man, 1 geaffekteerde man✓ *__25% of 1 uit 4 ✓__

Ouers en nakomelinge✓/P_1 en F_1
Meiose en bevrugting✓ **Enige 5 + 1*(Verpligtend)**

OF

P_1/ouers	Fenotipe	Normale man x Normale vrou
	Genotipe	X^DY x X^DX^d ✓
	Meiose	
	G/gamete	X^D , Y x X^D ; X^d ✓

Bevrugting

Gamete	X^D	Y
X^D	X^DX^D	X^DY
X^d	X^DX^d	X^dY
	✓✓	

F_1/ nakomelinge	Genotipe	X^DX^D ; X^DX^d ; X^DY ; X^dY✓
	Fenotipe	2 Normale vrouens 1 normale man, 1 geaffekteerde man✓ *__25% of 1 uit 4 ✓__

Ouers en nakomelinge✓/P_1 en F_1
Meiose en bevrugting✓ **Enige 5 + 1*(Verpligtend)** (6)
(12)

2.5 2.5.1
- Resultate in genetiese identiese nakomelinge ✓ verminder biodiversiteit van spesies se geenpoel✓
- Versterking van “goeie” of “slegte”gene ✓ (2)

2.5.2
- Produseer superieur lewende hawe vir vinnige voortplanting ✓
- Soos die mark verander kan lewende hawe geteel word om te reageer op die markveranderinge en vraag (eise) ✓
- Bevorder kommersiële oeste wat vinnig voortplant ✓
- Produseer verskeie vrugte en groente om raklewe van vars produkte te verleng ✓
- Minder vermorsing van voedsel en vervoerkoste✓

(MERK slegs eerste TWEE) **Enige 2** (2)
(4)

2.6

2.6 **Verskil**
- Darwin - evolusie vind plaas waar spesies geleidelike veranderinge ondergaan het oor ’n lang tydperk ✓
- Gepunktueerde ekwilibrium – evolusie behels lang tydperke waar spesies nie verander nie en dan gedurende kort periodes sal daar ’n vinnige verandering plaasvind. ✓

OF

Verskil
- Darwin - na ’n lang tydperk sal ’n nuwe spesie evoleer wat verskillend is van die voorvaders. ✓
- Gepunktueerde ekwilibrium – nuwe spesies word in ’n kort tydperk gevorm, relatief teenoor die lang periode van geen veranderinge nie. ✓

OF

Verskil
- Darwin - ondersteun dit dat daar baie oorgangsfossiele in die fossielrekord is, wat die progressiewe verandering toon oor ’n tydperk✓
- Gepunktueerde ekwilibrium – ondersteun deur die afwesigheid van oorgangsfossiele wat ’n periode van vinnige veranderinge aandui ✓

(MERK slegs eerste TWEE) **Enige 2 verskille** **(4)**
[40]

2.4 2.4.1 Die antibiotika is effektief✓ dit vernietig alle bakterieë✓
Die antibiotika is nie effektief nie ✓ dit vernietig nie alle bakterieë nie✓
Antibiotika is meer/ minder effektief ✓op sekere bakterieë / bakterieë A/B/C✓ (2)

2.4.2 Groei van bakterieë ✓ (1)

2.4.3 Die antibiotika is die effektiefste op bakterieë A✓ en gedeeltelik effektief op bakterieë B✓, maar nie effektief teen bakterieë C nie ✓ **Enige 2** (2)

2.4.4
- Dieselfde hoeveelheid antibiotika is gebruik✓
- Dieselfde grootte agar bord / oppervlak area✓
- Dieselfde konsentrasie / sterkte antibiotika✓
- Dieselfde tipe agar✓
- Dieselfde hoeveelheid bakterieë agar is aangewend✓

(MERK slegs eerste TWEE) **Enige 2** (2)

2.4.5
- Dra handskoene
- Hou bord geseël
- Was skoon / steriliseer
- Korrekte wegdoening

(MERK slegs eerste EEN) **Enige 1** (1)

2.4.6
- Herhaal die ondersoek✓
- Vergroot die monster / steekproef grootte ✓

(MERK slegs eerste EEN) **Enige 1** (1)

2.4.7
- Daar is groot hoeveelheid variasie✓ in die bakterium populasie
- Antibiotika word gebruik om ’n groot hoeveelheid bakterieë dood te maak ✓
- Sommige bakterieë het ’n eienskap / mutasie wat hul weerstandig maak teen die antibiotika✓
- Dit word natuurlike seleksie genoem✓
- Die bakterieë wat oorleef het, plant voort✓
- en dra die gunstige eienskap oor / weerstandigheid teen antibiotika oor na nakomelinge ✓
- Die volgende generasie het ’n groter deel van individue met gunstige eienskap / weerstand ✓
- Lei to ’n toename in populasie van weerstandige bakterieë✓

Enige 5 (5)
(14)

AFDELING B

VRAAG 2

2.1 2.1.1 ’n Skielike onverwagse verandering in die genetiese struktuur van ’n sel. ✓ (1)

2.1.2 Geenmutasie ✓ (1)

2.1.3
- Geenmutasies affekteer ’n enkele of ’n paar basisse in ’n enkele geen. ✓
- die basis volgorde STT verander na SAT✓
- wat ’n verskillende polipeptied (proteïen) produseer ✓

Enige 2 (2)

2.1.4 (a) Glutamiensuur✓ (1)

(b) Valien ✓ (1)
(6)

2.2
- Elke oRNS dra ’n spesifieke aminosuur✓
- wanneer die antikodon van die oRNS✓,
- pas (ooreenstem) by die bRNS kodon✓
- sal die oRNS die betrokke aminosuur bring na die ribosoom✓
- aminosure word geheg deur peptiedbindings✓
- en vorm die verlangde polipeptied/ proteïen✓ **(6)**

2.3 2.3.1 (a) Eiergrootte frekwensie/ Grafiek B ✓ (1)

(b) Bloedgroep / tipe frekwensie/ Grafiek A ✓ (1)

2.3.2 **Diskontinue variasie: Byvoorbeeld = Bloedgroepe**
- Individue val onder ’n aantal duidelike kategorieë ✓
- dis gebasseer op eienskappe wat nie gemeet kan word oor ’n volledige veld nie. ✓
- Jy het die eienskap of jy het dit nie✓
- Die omgewing het ’n klein effek op dié tipe variasie ✓

Enige 2 (2)

Kontinue variasie: Byvoorbeeld = Eiergrootte frekwensie
- Toon variasie met ’n volledige veld van metings✓
- van een uiterste na die volgende. ✓
- die eiers kan ’n volledige speling (omvang) hê van gewig ✓
- soms kenmerkend deur die omgewing geaffekteer, soos voedsel kwaliteit, dieet, weer en gemaklikheid van omgewing. ✓

Enige 2 (2)
(6)

1.5	1.5.1	nukleus✓		(1)
	1.5.2	8 ✓		(1)
	1.5.3	AGS ✓		(1)
	1.5.4	Translasie✓		(1)
	1.5.5	(a)	ribosoom✓	(1)
		(b)	oRNS / oordrag-RNS ✓	(1)
	1.5.6	6✓		(1)
	1.5.7	UAG ✓		(1)
				(8)

TOTAAL AFDELING A: 50

AFDELING A

VRAAG 1

1.1	1.1.1	A✓✓		
	1.1.2	B✓✓		
	1.1.3	A✓✓		
	1.1.4	C✓✓		
	1.1.5	C✓✓		
	1.1.6	A✓✓		
	1.1.7	A✓✓		
	1.1.8	D✓✓		
	1.1.9	D✓✓		
	1.1.10	D✓✓		
			(10x2)	**(20)**
1.2	1.2.1	Nukleus ✓		
	1.2.2	Fossiel ✓		
	1.2.3	Geen ✓		
	1.2.4	Prognaat /prominente✓		
	1.2.5	Tandestelsel / Tandstruktuur / dentisie ✓		
	1.2.6	Homosigoties / egtelend/ suiwertelend✓		
	1.2.7	Viervoetig ✓		
	1.2.8	Nie-disjunksie✓		
			(8x1)	**(8)**
1.3	1.3.1	Slegs B ✓✓		
	1.3.2	Slegs A ✓✓		
	1.3.3	Slegs A ✓✓		
	1.3.4	Slegs B ✓✓		
			(4x2)	**(8)**
1.4	1.4.1	Al die mans kan die pa wees / Geen mans kan uitgesluit word nie ✓		(1)
	1.4.2	Man 3 ✓		(1)
	1.4.3	(a) ii ✓		(1)
		(b) I^Ai ✓		(1)
	1.4.4	(i) ✓en (iv) ✓		(2)
				(6)

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

12. **Spelfoute**
Aanvaar as dit herkenbaar is, mits dit nie iets anders in Lewenswetenskappe beteken nie of as dit buite konteks is.

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

14. **Indien slegs die letter vereis word, maar slegs die naam gegee word (en andersom)**
Moenie krediteer nie

15. **As eenhede nie in mate aangedui word nie.**
Kandidate sal punte verbeur. Memorandum sal afsonderlik 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 (diagramme, grafieke, tabelle, ens.) moet ŉ opskrif hê.

18. **Vermenging van amptelike tale (terme en konsepte)**
ŉ Enkele woord of twee wat in enige amptelike taal voorkom anders as die leerder se assesseringstaal waarin die meeste van sy/haar antwoorde aangebied word, moet gekrediteer word, indien dit korrek is. ŉ Nasiener wat in die relevante amptelike taal vaardig is, moet geraadpleeg word. Dit geld vir alle amptelike tale.

19. **Veranderinge aan die memorandum**
Geen veranderinge mag aan die goedgekeurde memorandum aangebring word sonder dat daar met die provinsiale interne moderator beraadslaag is nie.

GAUTENGSE DEPARTEMENT VAN ONDERWYS

VOORBEREIDENDE EKSAMEN

LEWENSWETENSKAPPE
(Tweede Vraestel)

MEMORANDUM

BEGINSELS MET BETREKKING TOT DIE NASIEN VAN LEWENSWETENSKAPPE

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, byvoorbeeld, drie redes vereis en vyf gegee word**
   Merk net die eerste drie ongeag 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 word, maar beskrywings gegee word**
   Aanvaar indien die verskille / ooreenkomste duidelik is.

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

6. **As geannoteerde diagramme aangebied word, terwyl beskrywings vereis word**
   Kandidate sal punte verbeur.

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

8. **Indien die volgorde vaag is 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 en skakelings weer korrek is, gaan voort om te krediteer.

9. **Onherkenbare afkortings**
   Aanvaar indien dit aan die begin in die 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 antwoord die regte volgorde van die vrae pas, maar die verkeerde nommer word gegee, is dit aanvaarbaar.

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

VOORBEREIDENDE EKSAMEN

2016

MEMORANDUM

LEWENSWETENSKAPPE (TWEEDE VRAESTEL) (10832)

13 bladsye