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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

LIFE SCIENCES P2

2021

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 13 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

1. **If more information than marks allocated is given**
Stop marking when maximum marks are 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 a part of it is required**
Read all and credit the relevant part.
4. **If comparisons are asked for, but descriptions are given**
Accept if the 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 the 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 the answer, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**
Accept, provided it was accepted at the national memo discussion meeting.
14. **If only the letter is asked for, but only the name is given (and vice versa)**
Do not credit.

15. If units are not given in measurements

Candidates will lose marks. Marking guidelines 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 appear(s) in any official language other than the learner's 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. Changes to the marking guidelines

No changes must be made to the memoranda. The provincial internal moderator must be consulted, who in turn will consult with the national internal moderator (and the Umalusi moderators where necessary).

20. Official marking guidelines

Only marking guidelines bearing the signatures of the national internal moderator and the Umalusi moderators and distributed by the National Department of Basic Education via the provinces must be used.

SECTION A**QUESTION 1**

1.1	1.1.1	C✓✓		
	1.1.2	C✓✓/D		
	1.1.3	A✓✓		
	1.1.4	C✓✓		
	1.1.5	D✓✓		
	1.1.6	D✓✓		
	1.1.7	B✓✓	(7 x 2)	(14)
1.2	1.2.1	Hydrogen✓bond		
	1.2.2	Monohybrid✓cross		
	1.2.3	Stem✓ cells		
	1.2.4	Centriole✓/Centrosome		
	1.2.5	Metaphase✓I/II		
	1.2.6	Haemophilia✓		
	1.2.7	Speciation✓		
	1.2.8	Punctuated equilibrium✓		
	1.2.9	Genetics✓	(9 x 1)	(9)
1.3	1.3.1	Both A and B✓✓		
	1.3.2	B only✓✓		
	1.3.3	A only✓✓		
		2)	(3 x	(6)
1.4	1.4.1	Locus✓		(1)
	1.4.2	A - chromatid✓ C - centromere✓		(2)
	1.4.3	Crossing over✓		(1)
	1.4.4	Prophase I✓		(1)
	1.4.5	(a) Gg ^{tt} ✓✓		(2)
		(b) (Plant) height✓		(1)
				(8)

	1.5.1	(a) Y✓	(1)
		(b) X✓	(1)
	1.5.2	4✓/Four	(1)
	1.5.3	A; C; T; G✓ (must be in correct order)	(1)
	1.5.4	- (DNA) replication✓ - Transcription✓/Protein synthesis	(2)
		(Mark first TWO only)	(6)
1.6	1.6.1	(a) 4✓/Four	(1)
		(b) 1✓/One	(1)
	1.6.2	I ^A i✓✓	(2)
	1.6.3	(a) Son 1✓	(1)
		(b) Mother✓	(1)
		(c) Son 1✓	(1)
			(7)

TOTAL SECTION A: 50

- 2.4 2.4.1 - The grey fur colour is an intermediate phenotype✓/a blend of black and white
- This indicates that neither of the alleles is dominant✓ (2)

2.4.2 **P₁** Phenotype Grey x Black✓
Genotype BW x BB✓

Meiosis
G/gametes B, W x B, B✓

Fertilisation

F₁ Genotype BB, BB, BW, BW✓*
Phenotype Black Grey✓*

P₁ and F₁✓

Meiosis and fertilisation✓

2 compulsory marks + any 4*OR**

P₁ Phenotype Grey x Black✓
Genotype BW x BB✓

*Meiosis**Fertilisation*

Gametes	B	W
B	BB	BW
W	BW	WW

1 mark for correct gametes

1 mark for correct genotypes*

F₁ Phenotype Black Grey ✓*

P₁ and F₁✓

Meiosis and fertilisation✓

***2 compulsory marks + any 4 (6)
(8)**

- | | | | |
|-----|-------|--|--------------------------|
| 2.5 | 2.5.1 | <ul style="list-style-type: none"> - The dominant allele is always expressed (in the phenotype) when in the heterozygous condition✓✓ <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> - The dominant allele masks/hides the (phenotype of the) recessive allele✓✓ | (2) |
| | 2.5.2 | <p>(a) N✓</p> <p>(b) Tt✓</p> | (1)
(1) |
| | 2.5.3 | <ul style="list-style-type: none"> - J is a taster and therefore must have one dominant allele✓/T - Individual K is tt✓ - Individual O is a non-taster✓/is homozygous recessive/tt - She must have inherited a recessive allele/t from each parent✓ - Therefore, J must have one recessive allele✓/t <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> - J is a taster and therefore must have one dominant allele✓/T - If J is homozygous dominant✓/TT - and K is homozygous recessive✓/tt - then it is not possible to have child (O) who is homozygous recessive✓/ tt - as she must have inherited a recessive allele/t from each parent✓ | Any
(4)
(8) |
- [40]

QUESTION 3

- 3.1 3.1.1 - Bare fingertips✓/nails instead of claws
 - Opposable thumbs✓/ gripping ability
 - Fingerprints✓
 - Five fingers✓ Any (1)
(Mark first ONE only)

3.1.2

Differences between African apes and humans	
African apes	Humans
- Small cranium✓	- Large cranium✓
- Brow ridges are well developed✓	- Brow ridges are not well developed✓
- Large canines✓	- Small canines✓
- Palate is long and rectangular✓ / U-shaped	- Palate is small and semi-circular✓/ C-shaped
- Large jaws✓	- Small jaws✓
- More protruding jaws✓/ prognathous	- Less protruding jaws✓/non-prognathous
- Cranial ridges present✓	- No cranial ridge✓
- Foramen magnum in a backward position✓	- Foramen magnum in a forward position✓
- Sloping face✓	- Flat face✓
- Less developed zygomatic arch✓	- More developed zygomatic arch✓
- Less developed chin✓	- More developed chin✓
- Diastema between the teeth✓	- No diastema between the teeth✓

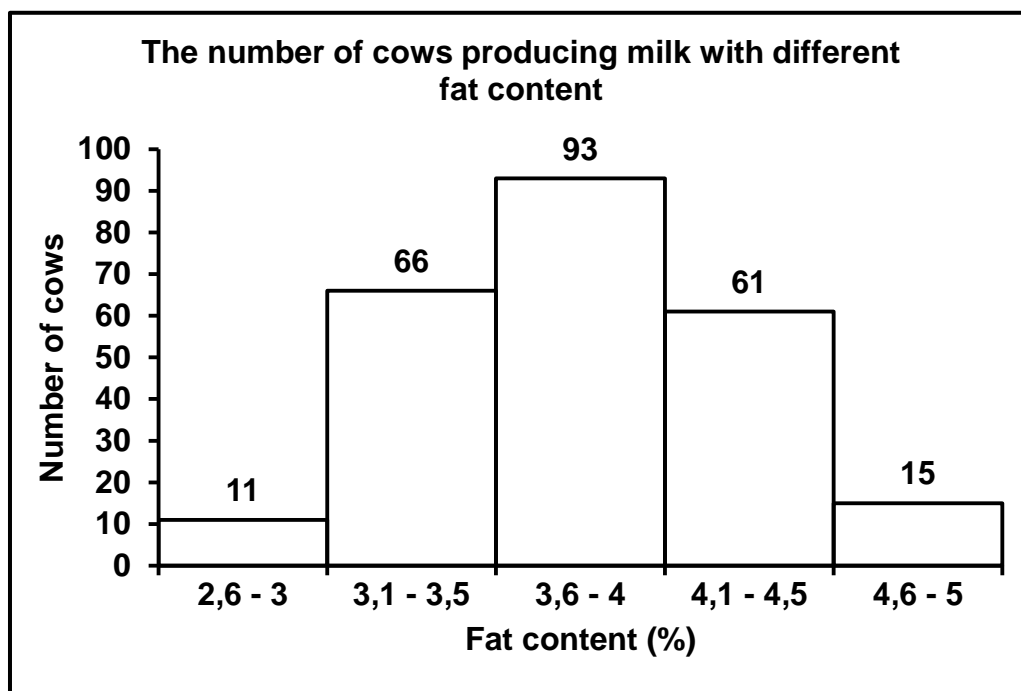
(Mark first THREE only)

Table 1 + (3 x 2)

(7)

- 3.1.3 - Short✓ and
 - wide✓/broad
 - Cup-shaped✓ Any (2)
(Mark first TWO only) (10)

3.2 3.2.1



(6)

Guideline for assessing the graph

CRITERIA	ELABORATION	MARK
Correct type of graph (T)	Histogram drawn	1
Caption of graph (C)	Both variables included	1
Axes labels (L)	X- and Y-axis correctly labelled with units	1
Scale for X- and Y-axis (S)	- Same width of bars for X-axis and - Correct scale for Y-axis	1
Plotting of bars (P)	1 to 4 bars plotted correctly All 5 bars plotted correctly	1 2

3.2.2 $\frac{11}{246} \times 100 = 4,47\%$ (Accept 4,5) (3)

3.2.3 Continuous variation (1)

3.2.4 There is a range of intermediate phenotypes / the fat content % is a range (1)
(11)

3.3	3.3.1	Phylogenetic tree✓/cladogram	(1)
	3.3.2	Emu✓ and Cassowary✓ (Mark first TWO only)	(2)
	3.3.3	<ul style="list-style-type: none"> - A flightless common ancestor✓ - existed on one continent✓ - Due to continental drift the original population split✓ - and each population evolved independently✓ - as they experienced different environmental conditions✓ - Each continent now has a different species of flightless bird✓ 	Any (4)
	3.3.4	<ul style="list-style-type: none"> - Allow time for them to interbreed✓/try to interbreed - If they produce infertile offspring✓/cannot interbreed, they are different species <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> - Conduct DNA analysis✓ and - check for differences✓ 	(2) (9)
3.4	3.4.1	Survival of the owls✓	(1)
	3.4.2	The brown owls are less suited to survive than the white owls✓✓ OR The white owls are more suited to survive than the brown owls✓✓	(2)
	3.4.3	<ul style="list-style-type: none"> - There is a decrease in the number of white owls✓ because - there is less snow✓ and - white owls will not be camouflaged✓/will be more visible to predators 	(3)
	3.4.4	<ul style="list-style-type: none"> - They counted/sampled the number of owls at the beginning✓ of the 4-month period - and again, at the end✓ - Then they calculated the difference✓ between the two numbers 	(3)
	3.4.5	(Same): <ul style="list-style-type: none"> - Time period✓/4 months - Population✓ - Season✓/winter - Method of calculation✓ (Mark first ONE only)	Any (1) (10) [40]

TOTAL SECTION B: 80

SECTION C**QUESTION 4****Lamarck (J)**

- He would use his law of use and disuse✓
 - and law of inheritance of acquired characteristics✓
 - The ancestor of spider monkeys had short tails✓
 - The ancestors continually stretched✓/used their tails
 - to be able to hold on to tree branches✓
 - As a result, their tails became longer✓
 - and this characteristic was passed on to the next generation✓
- Any (6)

Darwin (D)

- Evolution occurs by natural selection✓
 - There was variation in the ancestral population✓
 - Some spider monkeys had short tails✓
 - and some had long tails✓
 - Those with short tails could not hold onto tree branches✓/fell on the ground
 - They died✓/were attacked by predators
 - The spider monkeys with long tails were able to hold on to tree branches✓/did not fall to the ground
 - and survived ✓/were not attacked by predators
 - and reproduced✓
 - The characteristic for long tails was passed to the offspring✓
- Any (8)

Artificial selection (A)

- Humans select✓ the spider monkeys with
 - the long tails✓
 - and mate them to produce offspring with long tails✓
 - This is repeated over many generations✓
- Any (3)

Content: (17)
 Synthesis: (3)
(20)

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the question	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been sufficiently addressed
In this essay in Q4	Only information relevant to describing the evolution of long tails in spider monkeys in terms of: <ul style="list-style-type: none"> - Lamarck - Darwin - Artificial selection is included. There is no irrelevant information.	The description of the evolution of long tails in spider monkeys for each of: <ul style="list-style-type: none"> - Lamarck - Darwin - Artificial selection is logical and sequential.	At least the following are provided when describing the evolution of long tails in spider monkeys: <ul style="list-style-type: none"> - Lamarck (J: 4/6) - Darwin (D: 5/8) - Artificial selection (A: 2/3)
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 150