

Copyright reserved

A.A. CROWE
EXTERNAL MODERATOR

24/11/11

Please turn over

P. Preehlaff
UMALUSI
27/11/2011

24/11/11

P.B. MAJOZI
External Moderator
(Umalusi)

This memorandum consists of 12 pages.

INT MOD 24/11/11

24/11/11

DEPARTMENT OF BASIC EDUCATION
2011-11-10
PRIVATE BAG X 110
PRETORIA 0001
PUBLIC EXAMINATIONS

LIFE SCIENCES P2
VERSION 2 (OLD CONTENT) FOR PART-TIME CANDIDATES
NOVEMBER 2011
FINAL MEMORANDUM 24/11/2011

GRADE 12

NATIONAL SENIOR CERTIFICATE

basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



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 becomes correct again, resume credit.
9. Non-recognized abbreviations
Accept if first defined in answer. If not defined, do not credit the unrecognized 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 recognizable, 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

P.B. MAJOZI
External Moderator
(Umalusi)

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2011

Copyright reserved

P. Pretorius
UMALUSI

Please turn over

P.B. MAJOZI
External Moderator
(Umalusi)

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 Memorandum will allocate marks for units separately, except where it is already given in the question.
16. Be sensitive to the sense of an answer, which may be stated in a different way.
17. **Caption**
Credit will be given for captions to all illustrations (diagrams, graphs, tables, etc.) except where it is already given in the question.
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. In exceptional cases, the Provincial Internal Moderator will consult with the National Internal Moderator (and the External moderators if necessary).
20. Only memoranda 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 in the training of markers and in the marking.

Copyright reserved

Place firm over

P. Preetfall
J.M.A.U.S.I

P.B. MAJAZ (8)
External Moderator
(Umatusi)
(2)

SECTION A
QUESTION 1

1.1	1.1.1	B✓/A	1.1.2	B✓	1.1.3	C✓	1.1.4	D✓	1.1.5	D✓	1.1	(10)
1.2	1.2.1	(Scientific) theory✓	1.2.2	Eutrophication✓	1.2.3	(Bio)diversity✓	1.2.4	Palaeontology ✓	1.2.5	Alien✓/Exotic/Invasive	1.3	(5)
1.3	1.3.1	None✓	1.3.2	Both A and B✓/A and B/Both	1.3.3	Both A and B✓/A and B/Both	1.3.4	A only✓/A	1.3.5	Both A and B✓/A and B/Both	1.4	(10)
1.4	1.4.1	2002✓	1.4.2	The abalone will decrease✓/ become extinct	1.4.3	Species can become extinct	1.4.4	Upset the balance of ecosystems✓	1.4.4	Limit the size caught✓ Limit the number/quotas caught✓ Limit the harvesting/collection area✓ License to harvests ✓ Develop legislation✓ to regulate harvesting Scientific research✓ to inform legislation Minimal or no harvesting during breeding season✓/limited harvesting season Education and awareness of endangered species✓ Encourage mariculture✓/sea farming/agriculture Discouraging illegal market by government selling it at lower price✓ Stricter monitoring✓ Heavy penalties ✓ Declare protected species✓	(3)	(2)

Copyright reserved

Please turn over

F. Preethaff
UMALUSI

P.B. MAJOZI
External Moderator
(Umalusi)

[Handwritten signatures]

1.5	1.5.1	(a) Mayfly nymph ✓ (b) Sludge worms ✓ (c) Leeches ✓	(1) (1) (1)
	1.5.2	- The size/volume of the water samples must be the same ✓ - The samples must be taken at the same depth ✓ - Samples must be taken at the same time in all three areas ✓ - Use sterile/clean containers ✓ (Mark first TWO only)	(2) (any 2)
	1.5.3	- Wear rubber gloves/protective clothing when taking the samples ✓ - so as not to get contaminated with germs ✓ - Samples should be taken by using a container/bottle attached to a string ✓ to avoid stepping too close to the river bank ✓/prevent drowning/falling into water (Mark first TWO only)	(4)
	1.5.4	The amount of O ₂ decreases ✓ as the amount of waste decreases. ✓ When the amount of waste levels off ✓, the amount of oxygen increases ✓ until it becomes constant ✓	(4) (any 4)
1.6	1.6.1	Paleozoic Era ✓	(1)
	1.6.2	(a) Paleozoic Era ✓	(1)
		(b) Permian ✓	(1)
	1.6.3	Cretaceous extinction ✓	(1)
50	TOTAL SECTION A:		(4)

SECTION B

QUESTION 2

2.1 2.1.1 (Allopatric) speciation ✓

(1)

2.1.2 There is genetic variation within the fishes ✓
 The water level dropped and separates the fish into 3 populations ✓
 The fishes lived under different environmental conditions ✓ / had
 different sources of food
 The fishes underwent natural selection ✓ independently
 in each lake
 Only those fishes that were better suited ✓
 to obtain the type of food available survived ✓
 Continued natural selection in each lake over many generations ✓
 resulted in each lake having species that were very different
 (genotypically and phenotypically) from species of other lakes ✓
 These differences prevented them from interbreeding ✓
 leading to the formation of new species ✓

(8)

(any 7)

2.2 2.2.1 crossing over ✓ takes place
 leading to an exchange of genetic material ✓ / recombination occur
 between homologous chromosomes ✓
 random arrangement ✓ of chromosomes / independent assortment
 along the equator ✓
 allow different combinations of chromosomes to move into each
 daughter cell ✓
 thus leading to variation in the gametes ✓ produced

(6)

(any 6)

2.2.2 Large number of gametes produced ✓
 Gametes are different because they are produced by meiosis ✓
 random fusion of gametes ✓
 therefore the offspring ✓ produced
 will be genetically different ✓

(4)

(any 4)

2.3

Lamarck	1. Law of use and disuse ✓
Darwin	1. Law of natural selection ✓
	2. The acquired ✓ characteristics are passed on to the next generation
	2. Inherent ✓ genetic characteristics can be inherited from parents
	3. Organisms have an internal drive to change ✓ / deterministic internal drive to change ✓ / nature selects the best to survive
	4. Individuals change ✓
	4. Populations change ✓
	5. Infers that no extinction because organisms adapt and therefore survive ✓
	5. Extinction occurs since organisms may have features that do not favour survival ✓

No mark for table

(4)

F.B. MAJOZI
Internal Moderator
(Jmatusi)

P. Pretorius
Jmatusi
Place firm name

Copyright reserved

Copyright reserved

Disced from award

P. Preethkall
EMALUSI

P.B. MAJOZI
External Moderator
(Umalsi)

(3)	2.4	Gill slits/arches are found in all the vertebrate embryos A tail is found in all the vertebrate embryos Notochord Fish-like/tubular heart Cephalisation	(Mark first THREE answers)
(2)	2.5.1	Desirable alleles can be selected and passed on to successive generations	(3)
(5)	2.5.2	Reduction of the gene pool passing on unfavourable characteristics such as the inability to adapt to new environments, and increased ability to contract diseases easily.	(3)

[30]

Copyright reserved

P.B. MAJOZI
External Moderator
(Umalsi)

F. Preetfall
JMALUSI

Please turn over

Lethal: the mutated organism dies and the harmful characteristics are not passed on to the next generation ✓

Neutral: has no effect on the structure and functioning of the organism ✓

3.2.3

Drugs chemicals, radiation, viruses, high temperature (Mark first TWO answers only) (any 2)

3.2.2

Changes in the genetic code/gene/structure of DNA

3.2.1

3.2

(Mark first THREE answers only) (any 3)

(10)
(3)

- Upright posture ✓
- Long upper arms ✓
- Freely rotating arms ✓
- Elbow joints allowing rotation of forearm ✓
- Rotate hands at least 180° ✓
- Flat nails instead of claws/bare finger tips
- Opposable thumbs which work in opposite direction to their fingers
- Large brains/cranium compared to their body mass ✓
- Eyes in front/binocular vision/stereoscopic vision
- Eyes with cones/colour vision
- Sexual dimorphism/distinct differences between male and female
- Olfactory brain centres reduced/reduced sense of smell
- Parts of the brain that process information from the hands and eyes are enlarged ✓
- Two mammary glands only ✓

3.1.2

(Mark first THREE answers only) (any 3 x 2 = 6 + 1 for table)

(7)

GORILLA	HUMAN
1. Smaller head ✓	1. Larger head ✓
2. Longer arms in relation to body ✓	2. Shorter arms in relation to body ✓
3. Opposable toes on feet ✓	3. No opposable toe on feet ✓
4. Wider pelvis ✓	4. Smaller pelvis ✓
5. Hand bones longer ✓	5. Hand bones shorter ✓
6. Straight attachment between femur and pelvis ✓	6. Angular attachment between femur and pelvis ✓
7. Ribcage wider ✓	7. Ribcage narrow ✓
8. Thin tibia and fibula ✓	8. Thick tibia and fibula ✓
9. Bones of the hind limb shorter ✓	9. Bones of the hind limb longer ✓
10. Shorter skeleton ✓	10. Taller skeleton ✓
11. Short vertebrate column ✓	11. Longer vertebrate column ✓
12. Short neck ✓	12. Long neck ✓
13. Small eye sockets ✓	13. Large eye sockets ✓

3.1 3.1.1

QUESTION 3

Copyright reserved

Please turn over

P. Preehalla
JMALUSI

P.B. MAJOZI
External Moderator
(Umalusi)

(1)	3.3.1	Air conditions ✓/exhaust fumes and normal air conditions	3.3
(3)	3.3.2	Exhaust gases ✓have a negative effect ✓/ positive effect/ no effect on the percentage of seeds that germinate ✓	3.3.3
(2)	3.3.3	She replicated the investigation three times ✓	3.3.4
(2)	3.3.4	Little/no O ₂ in exhaust fumes ✓ compared to normal atmospheric air negatively affects germination in seeds. ✓ OR More O ₂ in normal atmospheric air ✓ compared to exhaust fumes favours germination ✓ OR More CO/pollutants in exhaust fumes ✓ compared to normal atmospheric air ✓ negatively affects germination in seeds. ✓ OR Less CO/pollutants in normal atmospheric air ✓ compared to exhaust fumes favours germination ✓	3.3.5
(2)	3.3.5	$(27 + 31 + 45) \div 103 = 3 = 34.3\%$	3.3.6
(2)	3.3.6	Education ✓ Monitoring ✓ of air quality Developing and implementation of government policy/legislation ✓ Penalties for polluting air/soil ✓ Prevent the release of chemicals ✓ Report air pollution ✓ Filters on exhausts/catalytic converters ✓ Using alternative fuel ✓/reduce use of fossil fuels	(Mark first TWO only)
(12)	[30]	TOTAL SECTION B:	60

SECTION C

QUESTION 4

4.1 4.1.1

Changes in the population size of dark peppered moths and the amount of pollution over time

4.1.2

Population size/amount of pollution

(1)

4.1.3

As the pollution increases the number of dark peppered moths increase

(2)

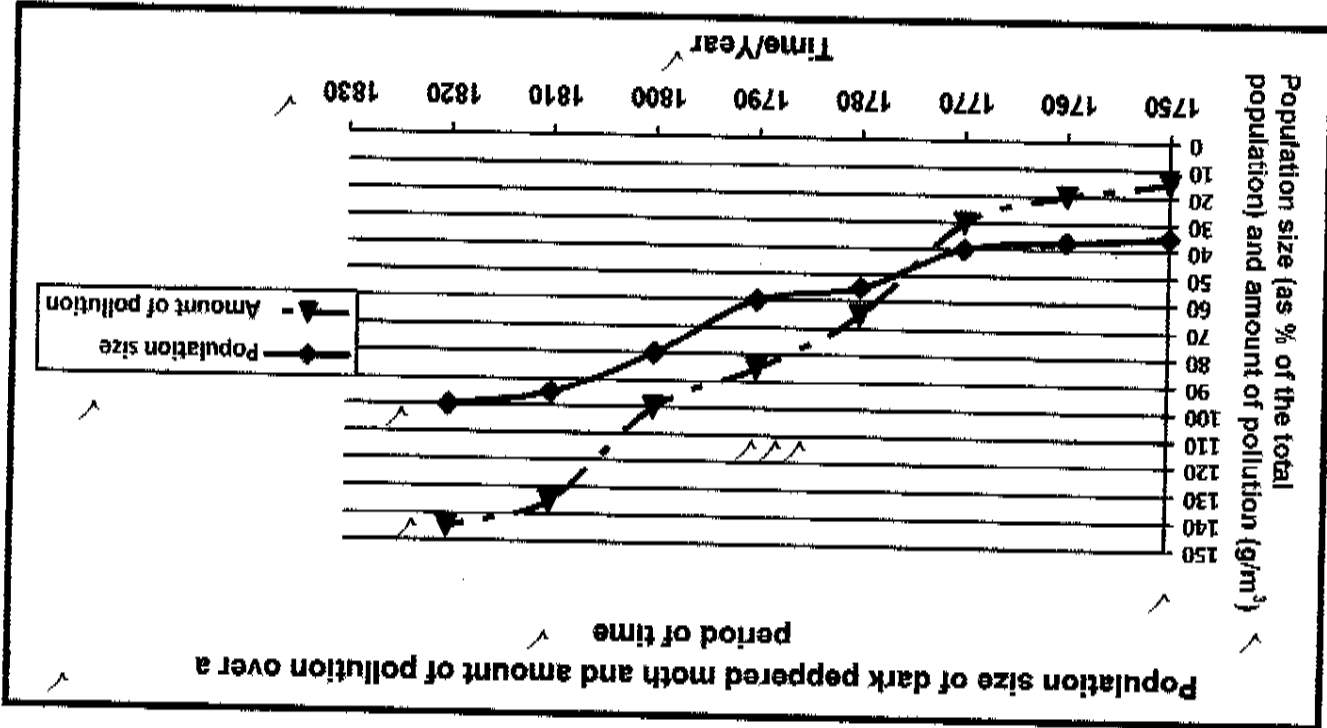
OR

As the pollution decreases the number of dark peppered moths decrease

(2)

4.1.4

Population size of dark peppered moth and amount of pollution over a period of time



Rubric for the mark allocation of the graph

Correct type of graph	1
Caption for graph	1
Correct label for X-axis	1
Graphs labelled/key provided for 2 graphs	1
Correct label for Y-axis including units	1
Appropriate scale for X-axis	1
Appropriate scale for Y-axis	1
Drawing of graphs	1
All points joined for graph A	1
All points joined for graph B	1
1 - 1 to 8 points plotted correctly	1
2 - 8 to 15 points plotted correctly	1
3 - all 16 points plotted correctly	1

NOTE:

If the wrong type of graph is drawn:

- Marks will be lost for 'correct type of graph'

- Marks will be lost for 'joining of points'

- Marks will be lost for 'correct type of axes'

- Mark the first graph only using the given criteria

- If axes are transposed:

- Marks will be lost for labelling of 'X-axis' and 'Y-axis'

Count not received

P. Preehlaff

LMALUSI

Please turn over

P.B. MAJOZI
External Moderator
(Umlazi)

(12)
(17)

[Handwritten signature]

Place firm over

G. Preetfall
DMALUSI

P.B. MAJOZI
External Moderator
(Malawi)

Copyright reserved

(2)	Biodegradable – Products that can be broken down by organisms such as bacteria and fungi e.g. any organic waste/faeces/vegetable matter, etc.	4.2.1	4.2
(2)	Non-biodegradable – Products that cannot be broken down by organisms such as bacteria and fungi e.g. glass/plastic, etc.	4.2.2	4.2
(2)	$\frac{200}{400} \times 100 = 50\%$	4.2.3	4.2
(1)	280 years	4.2.4	4.2
(1)	Health risk		
(1)	Aesthetics of the environment will be degraded		
(1)	Chemicals can be released into the environment		
(1)	Negative impact on food chain/biotic components		
(1)	Attract scavengers		
(8)	(any 1)		

[Handwritten mark]

24/01/2011
 A.A. CROWE
 EXTERNAL MODERATOR
 (Umalusi)

24/01/11
 A.A. CROWE
 EXTERNAL MODERATOR
 (Umalusi)

Copyright reserved

TOTAL SECTION C: 40
 GRAND TOTAL: 150

(15)
 (3) Synthesis

Marks	Description
3	Well structured – demonstrates insight and understanding of question
2	Minor gaps in the logic and flow of the answer
1	Attempted but with significant gaps in the logic and flow of the answer
0	Not attempted/nothing written other than question number/ All irrelevant information

ASSESSING THE PRESENTATION OF THE ESSAY

(12)
 (2) Content

(Mark first TWO only)

- Gastroenteritis ✓
- Cancer ✓
- Typhoid ✓
- Allergies ✓
- Cholera ✓
- Diarrhoea ✓
- Infections/rashes ✓

Effects on human physiology and health

(Mark first TWO only)

- Sewage ✓
- Waste from factories ✓
- Dumping of rubbish/waste ✓
- Soap and chemicals entering the water ✓

Sources of water pollution

(Mark first FOUR only)

- Legislation / monitoring of emissions from industries to discourage water pollution ✓
- Provide adequate sewage systems ✓ so that people do not urinate or pass faeces near a source of water ✓
- Provide clean containers to collect water ✓ so that pollutants do not contaminate the water ✓
- Educate people ✓ on the importance of caring for our environment ✓
- Reduce the use of pesticides ✓ so that less run off to our rivers ✓
- Provide purified / safe water to everyone to avoid use of contaminated water ✓
- Conduct research ✓ to find ways of reducing pollution ✓

Management strategies to improve the quality of water

4.3