Grade 10	Hillcrest High School	November 2013
Time: 2.5 hours	Life Science Exam	Marks: 150
Examiner: Mrs.D. Gerry	**Paper 2**	

INSTRUCTIONS AND INFORMATION:

- *Write **your name** and your Life Science **teachers Name** on your Answer paper.*
- *Answer all the questions.*
- *Number your answers exactly the same as the question paper.*
- *It is in your interest to write legibly and to present your work neatly.*

SECTION A

Question 1

Indicate the correct answer by writing down the letter of your answer next to the question number.

1.1.1 The biotic component of an ecosystem is it's...:

A. plants and animals
B. nitrogen
C. temperature
D. mineral salts

1.1.2 Organisms that live in water are called...

A. terrestrial
B. xerophytes
C. aquatic
D. mesophytes

1.1.3 Which of the following describes a community within an ecosystem?

A. All the animals in an area
B. All the plants in an area
C. All the plants and animals in an area
D. The total number of one specie in an area

1.1.4 Which of the following processes occur during the nitrogen cycle:

i) Consumption of plant protein by herbivores
ii) The decay of dead organisms by decomposers
iii) The conversion of nitrates to nitrites by bacteria
iv) The absorption of nitrates by plants

A. i, ii, and iii
B. i, iii and iv
C. i and iv
D. i, ii, and iv

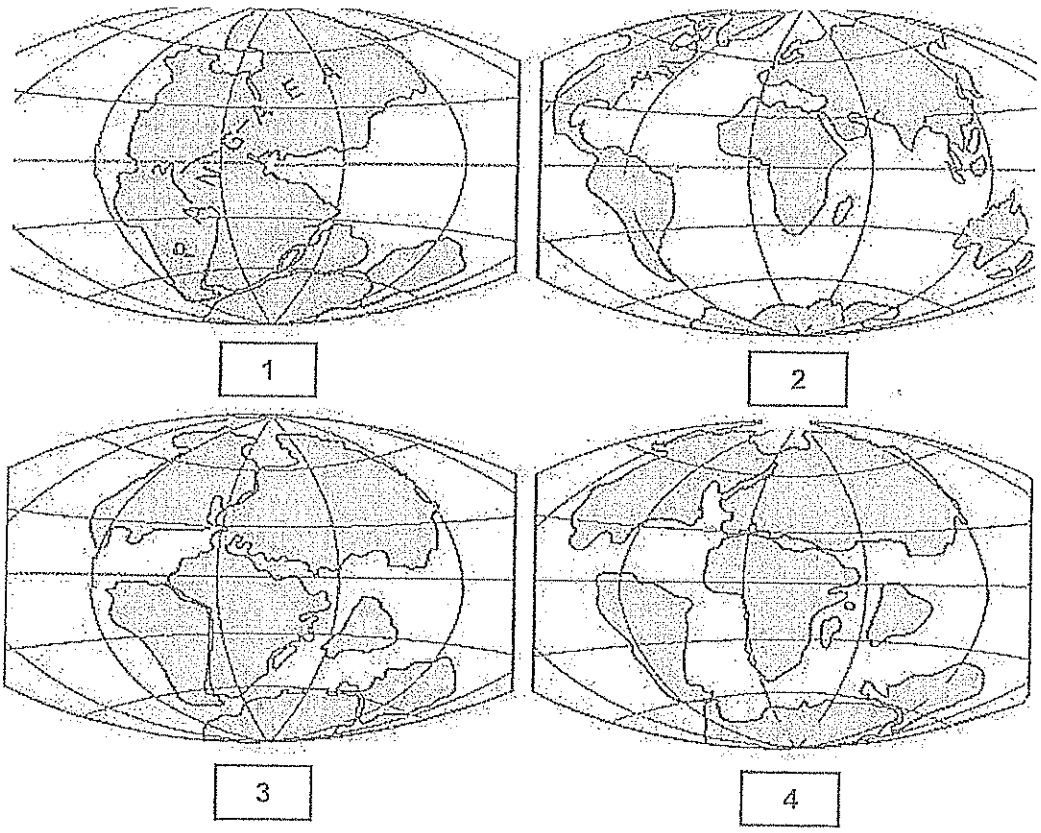
1.1.5 Every species is given a two word Latin name called a ...

A. Linnaeus
B. dipole
C. binomial
D. polynomial

1.1.6 The correct way to write the scientific name for a domestic dog is...

A. canis familiaris
B. Canis Familiaris
C. CANIS familiaris
D. Canis familiaris

Refer to the diagram and answer questions 1.7 to 1.10.



1.1.7 Diagram 1. Represents earths land formation during which of the following periods?

A. Permian
B. Triassic
C. Jurassic
D. Tertiary

1.1.8 The correct sequence of events during the above process is...

A. 4, 3, 2, 1
B. 1, 3, 4, 2
C. 1, 2, 3, 4
D. 1, 4, 3, 2

1.1.9 The diagrams above illustrate...

A. Techtonic plates
B. Continental drift
C. Asteroid impact
D. Volcanic activity

1.1.10 The southern divide of continents was named:

A. Gondwana land
B. Southern land
C. Laurasia
D. Antarctica

(10x2=20)

1.2 Provide the correct biological term for each of the following:

1.2.1 Factors which include aspect, slope and altitude
1.2.2 A set of interconnected food chains
1.2.3 A biome that is characterised by having large trees and shade loving shrubs
1.2.4 An organism that is not indigenous to an area and has become a problem
1.2.5 Plants that are adapted to living in dry habitats
1.2.6 The death of all individual species living in the world at one time
1.2.7 The wall of tissue separating the left and right sides of the heart
1.2.8 Organisms responsible for decomposition of organic matter
1.2.9 Species that no longer exist
1.2.10 Unicellular organisms that lack a membrane-bound nucleus (10)

1.3.1 The following question consists of a statement in the first column and two items in the second column (marked A and B) in the second column.

Indicate whether the statement applies to item(s):

- A only
- B only
- Both A or B
- None

No.	Statement	Items
1.3.1	Possible cause of the sixth mass extinction	A. Climate change B. Human Impact
1.3.2	The loss of water in vapour form	A. Transpiration B. Evaporation
1.3.3	When carbon dioxide is removed from the atmosphere	A. Respiration B. Photosynthesis
1.3.4	A fossil that has characteristics belonging to two different	A. Transitional fossil B. Cast fossil
1.3.5	The part of the earth where life is found	A. Atmosphere B. Hydrosphere
1.3.6	Contraction of the Atria and ventricles during the cardiac cycle	A. diastole B. systole
1.3.7	Structures in blood vessels that ensure one directional flow	A. ventricles B. SA nodes
1.3.8	Organisms that cannot produce their own food	A. heterotrophic B. autotrophic
1.3.9	The study of the distribution of living organisms in specific geographical regions on earth.	A. archaeology B. biogeography
1.3.10	The position of an area in relation to the sun	A. Aspect B. Slope

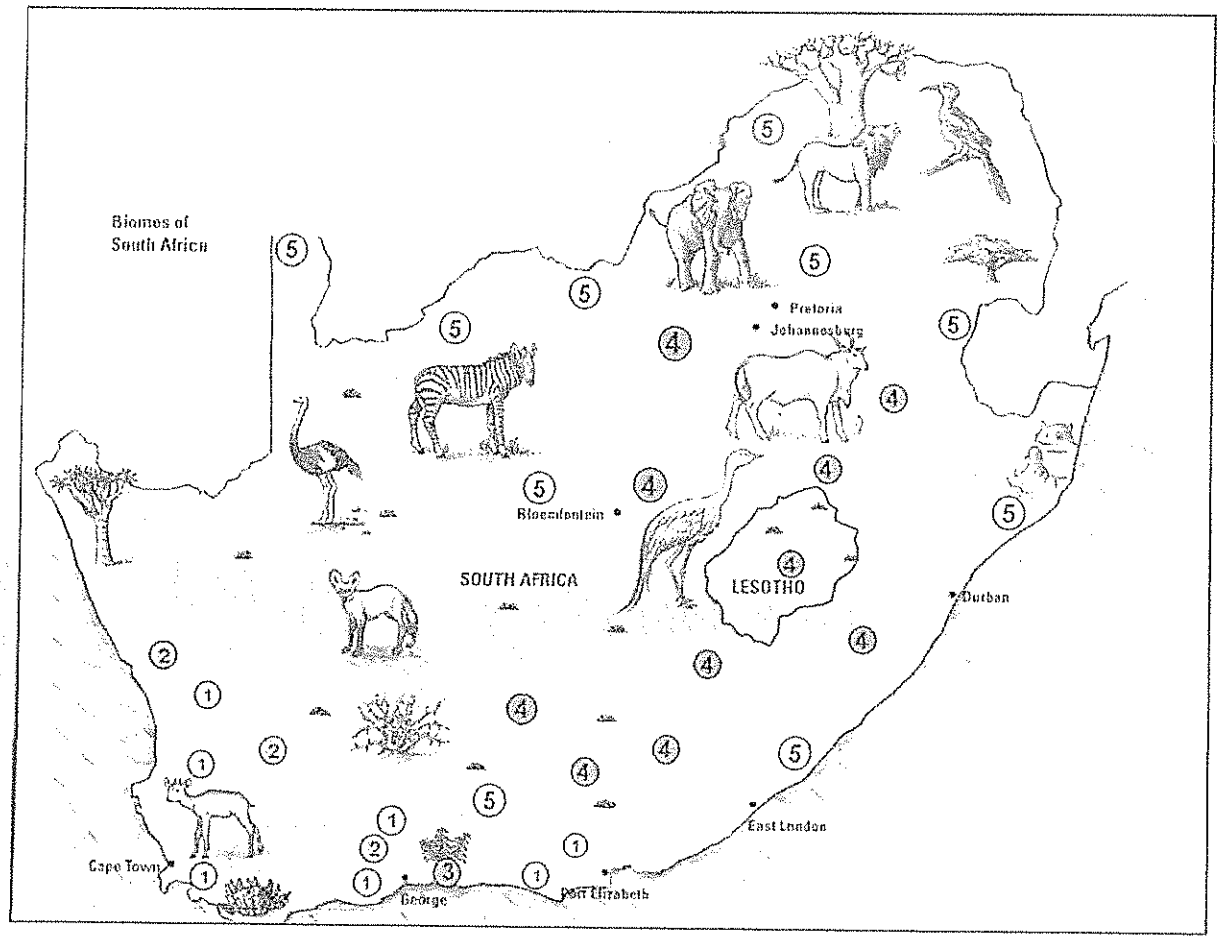
(10x2=20)

TOTAL SECTION A 50

SEC TION B

Question 2

2.1 The diagram below represents the distribution of Biomes of South Africa.

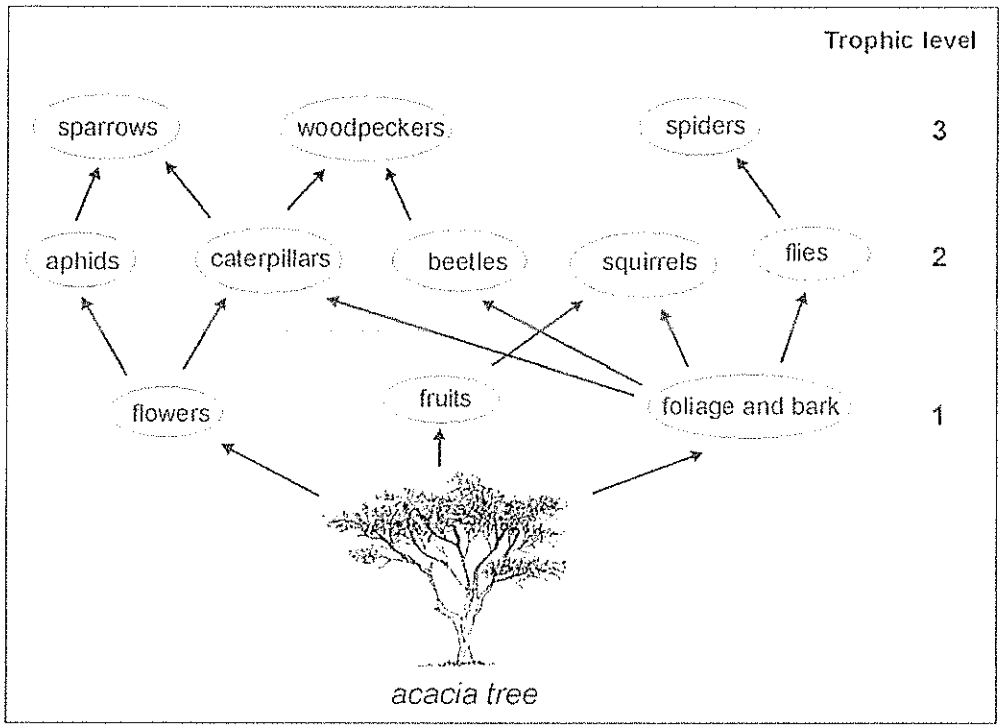


2.1.1 Name the biomes numbered 1 to 5 on the map. (5)

2.1.2 Write down the number only of the biome that:

a. has proteas, ericas and restios
b. the greatest number of succulent plant species in the world
c. is often referred to as the bushveld
d. consists mostly of grasses with deep, dark fertile soil
e. is made up of indigenous forest (5)

2.2 Study the diagram below and answer the questions that follow:



2.2.1 Name the organism that represents the following:
a. Herbivore
b. Producer (2)

2.2.2 The acacia tree contains 1000Kj/m2 per year of energy. Only 10% of this energy is passed on at each trophic level of the food chain. How much energy will be passed on to the sparrows. Show all your calculations. (4)

2.2.3 If all the caterpillars in this food chain were removed, explain what would happen to the sparrow population. (2)

2.2.4 using the information from the diagram, draw a food chain representing four trophic levels. (2)

2.3 Three soil samples taken from different regions were analysed for air content, permeability to water and humus content. The results obtained are shown in the table below.

SOIL SAMPLE	A	B	C
Air content (%)	30	10	60
Permeability to water(ml of water passing through 100g of soil per minute)	20	5	70
Humus content (%)	25	10	5

2.3.1 According to the results above which soil sample, A, B or C would be the following:

a. Loam
b. Clay
c. Sand (3)

2.3.2 Explain the disadvantages for the plants growing in soil sample B with regard to the permeability to water. (2)

2.3.3 Name TWO factors relating to the composition of soil sample B that resulted in its low permeability to water. (2)

2.3.4 State TWO advantages of a higher percentage of humus for the soil. (2)

2.3.5 Name the abiotic factor concerned with soil content and texture. (1)

2.4 Study the table below and then answer the questions that follow:

Decay of Carbon								
Years from the present	0	5730	11460	17190	22920	X	34380	40110
Numbers of half-lives elapsed	0	1	2	3	4	5	6	7
Percentage of original Carbon-14 remaining	100	50	25	12.5	6.25	Z	1.56	0.78

2.4.1 Name Two types of methods used to determine the age of fossils. (2)

2.4.2 Calculate the value of:

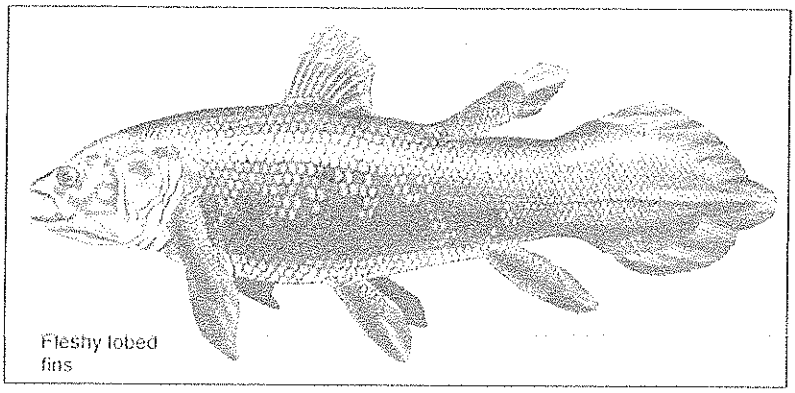
a. X (2)
b. Z (2)

2.4.3 Explain why it would not be possible to date a fossil which existed 80 million years ago using the decay of carbon-14. (2)

2.4.4 Give TWO reasons why there are gaps in the records. (2)

Question 3

3.1 Study the diagram below and answer the questions that follow.



3.1.1 Identify the animal shown in the diagram. (1)

3.1.2 When and where was it first discovered in South Africa? (2)

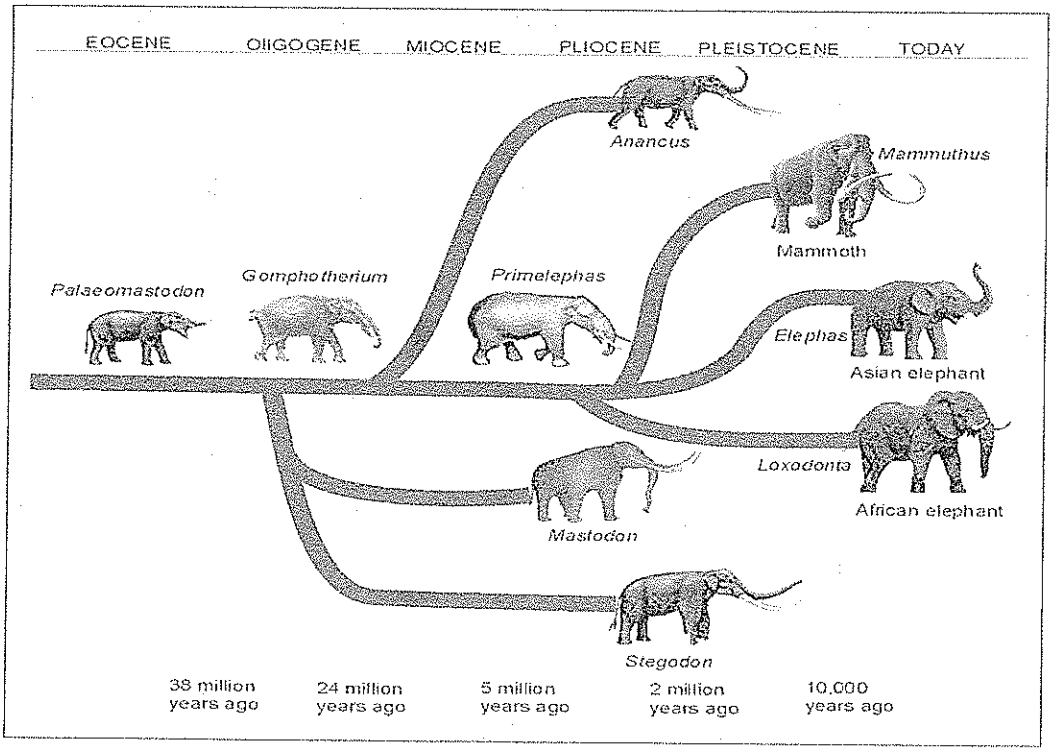
3.1.3 Which two groups of animals is this 'living fossil' thought to be the link between? (2)

3.1.4 Provide a reason for your answer to 3.1.3. (2)

3.1.5 Why is this animal called a living fossil? (2)

3.1.6 Name one way in which the body of this fish differs from bony fish we see today. (1)

3.2 The diagram below represents the evolution of the modern day elephant.



3.2.1 Name the ancestor of the elephant. (1)

3.2.2 When did the ancestor of the elephant first appear on earth? (1)

3.2.3 How does the ancestor differ from the modern day elephant? (3)

3.2.4 Give the scientific name of the African Elephant. (1)

3.2.5 According to the diagram, which evolved first – the African elephant or the mammoth? (1)

3.2.6 When did the mammoth become extinct? (1)

3.2.7 Is the African elephant under threat of becoming extinct?
Give a reason for your answer. (2)

3.3 During an investigation on fitness, the following results were obtained:

Table 1

	Learners who do not play sport or exercise	Learners who play sport or exercise twice a week	Learners who play sport or exercise three or more times a week
Average resting heart rate	93	72	65
Average heart rate after 5 minute fitness exercise	125	96	85

Table 2: Fitness level indicator:

Resting heart rate (beats/min)	Heart rate after 3 minutes of exercise (beats/min)	Fitness level
50	<80	Very fit
60	81-100	Above average fitness
75	90	Average fitness
90	100-115	Below average fitness
100	>135	Very unfit

3.3.1 Suggest a hypothesis for the investigation (2)

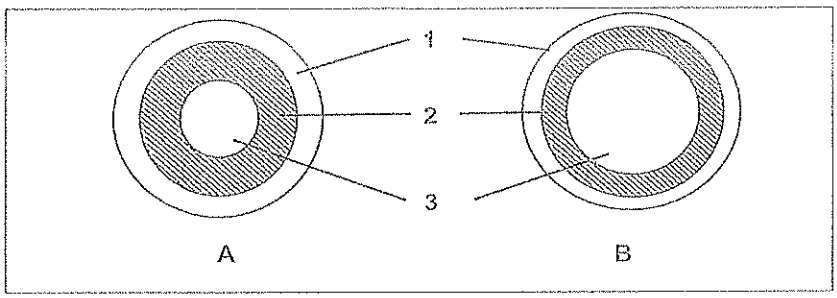
3.3.2 Identify the:

a. dependent variable (1)
b. independent variable (1)

3.3.3 Draw a bar graph to represent the results obtained as indicated in table 1.. (5)

3.3.4 Write a conclusion for the investigation. (2)

3.4 Study the diagrammatic representation below and answer the questions that follow:

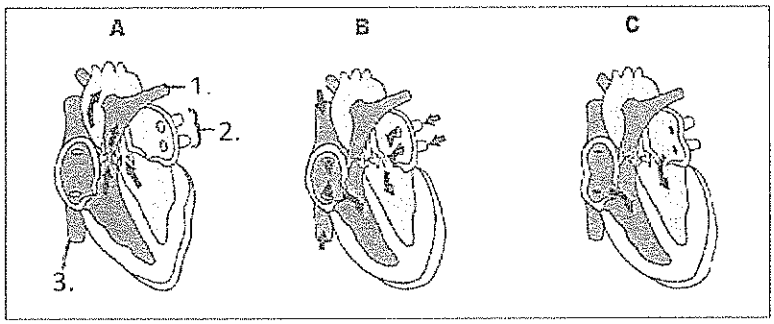


3.4.1 Which blood vessel A or B represents an artery? (1)

3.4.2 Suggest one reason for your answer to 3.4.1. (1)

3.4.3 Which blood vessel A or B has valves? (1)

3.4.5 Study the following representations of the cardiac cycle and answer the following questions:



3.4.6 Write down the letters of the diagram(s) that are associated with the:

a. Ventricular systole (1)
b. Atrial systole (1)
c. General diastole (1)

3.4.7 Provide labels for parts numbered 1, 2 and 3. (3)

TOTAL SECTION B 80

SECTION C

Question 4

Ecotourism is the fastest growing segment of tourism in South Africa. It generates jobs employing 1 in 25 people. About 5.6million foreign visitors arrive in South Africa for holiday purposes annually. These visitors bring in about 3.6% GDP (Gross domestic profit) into the country.

Write an essay to discuss the importance of ecotourism in South Africa and the principles and management that needs to be followed for effective ecotourism. Describe an example of ecotourism in South Africa to enhance your discussion.

Content (17)
Synthesis (3) [20]

TOTAL SECTION C 20

GRAND TOTAL 150