education

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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES P2

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MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 8 pages.

SECTION A

QUESTION 1

1.1
1.1.1 A✓✓
1.1.2 C✓✓
1.1.3 C✓✓
1.1.4 D✓✓
1.1.5 C✓✓
1.1.6 D✓✓
1.1.7 C✓✓
1.1.8 B✓✓
1.1.9 B✓✓
1.1.10 D✓✓

(10 x 2) **(20)**

1.2
1.2.1 Oxygen✓
1.2.2 Biogeography✓
1.2.3 Nitrogen✓
1.2.4 Alien✓ species
1.2.5 Radiometric dating✓
1.2.6 Relative dating✓
1.2.7 Living fossils✓
1.2.8 Gondwanaland✓
1.2.9 Coelacanth✓

(9 x 1) **(9)**

1.3
1.3.1 A only✓✓
1.3.2 B only✓✓
1.3.3 A only✓✓
1.3.4 Both A and B✓✓
1.3.5 B only✓✓

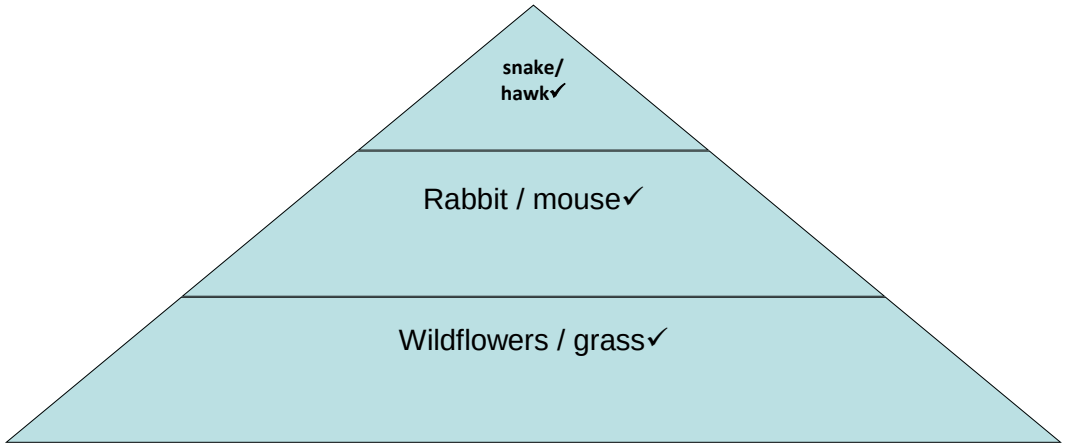
(5 x 2) **(10)**

1.4
1.4.1 Food web✓ (1)

1.4.2 A well-defined area✓ in which there is a close interaction between the plants, animals and the environment. ✓ (2)

1.4.3 (a) rabbit /mouse✓ (Any 1) (1)
(b) hawk✓ (1)

1.4.4



Food pyramid✓ (4)

1.4.5 They are a source of food for rabbit and mouse✓, they will need to find another source of food✓ or emigrate. This will affect the snake and hawk as they depend on them for food too✓.
The food chain/web will collapse✓

OR

The rabbit and mouse will die first, ✓
then there will be no food for the snake and hawk, ✓
and they will die✓ or emigrate✓ (Any 2) (2)

(11)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1 2.1.1 A circulation of water between the water vapour in the atmospheric air✓ and the water on and beneath the ground✓. (2)

2.1.2 Hydrogen✓ and oxygen✓ (2)

2.1.3 Aspect✓, slope✓ and altitude✓ (3)

2.1.4 Y✓ (1)

2.1.5 - Y facing south✓
- south facing side receives less solar radiation✓ (2)

2.1.6 - the sun provides radiant energy for plants to photosynthesise✓
- causes water to evaporate into water vapour✓
- warms moist air which rises✓ into the atmosphere where water condenses✓ (4)

2.1.7 **B** - transpiration✓ - water vapour rises into the atmosphere✓
C - condensation ✓- as the water vapour rises, it cools / forms water droplets✓
E - infiltration/percolation ✓ - some water is absorbed by the soil and some filters through the soil to reach the water table✓
(3 x 2) (6)
(20)

2.2 2.2.1 The sudden death of a large number of species✓ in short time. (1)

2.2.2 (Accept answer from) 55 - 60✓million years ago✓/mya (2)

2.2.3 Permian✓ extinction (1)

2.2.4 400✓ – 200✓ = 200✓ families
OR
400✓ – (210 to 230) ✓ = (190 to 170) ✓ families (3)

2.2.5 - Many genera were wiped out completely✓ during the extinction
- so, their niches were left open✓ /less predators.
- These niches were rapidly taken over by other genera✓ /species,
- who diversified and formed new genera✓/species by natural selection
(5)
(12)

2.3 2.3.1 Synapsids✓ (1)

2.3.2 External eardrum✓/laying eggs Any (1)
(Mark the first answer only)

2.3.3 Teeth✓
Hair✓
Warm blooded metabolism✓
Body lifted from the round ✓ Any (2)

2.3.4 Feathers✓ /hollow bones✓ /wings/beak Any (2)
(Mark first two answers only)

2.3.5 Small teeth✓ /vertebrae in tail/claws on front limbs Any (1)
(Mark the first answer only)

2.3.6 Missing link ✓/transitional fossil (1)
(8)
[40]

QUESTION 3

3.1 3.1.1 - They often strike down the victim in their productive years of life, ✓ removing the breadwinner from families✓

OR

- When non-fatal, they result in severe disability ✓and consequent impoverishment for entire families. ✓ (2)

3.1.2 R8 billion per annum✓ (1)

3.1.3 - healthy diet✓
- lower intake of fatty foods ✓
- maintaining a healthy weight✓
- exercise✓
- medication taken to lower cholesterol ✓
- stop smoking✓

(Mark first four only) (4)

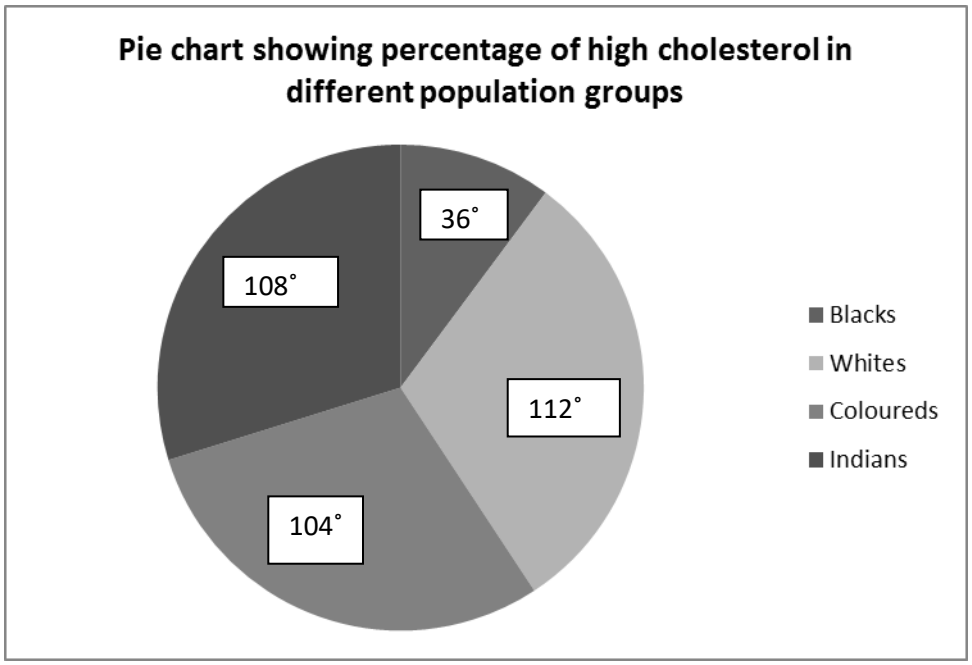
3.1.4 **Heart attack**: When the coronary vessels become blocked, there is not enough blood flow to the cardiac muscle. ✓ This may result in the death of the cardiac muscle cells ✓ and a person will have a heart attack. (2)

Stroke: a blood clot or a burst blood vessel prevents blood flow to the brain. ✓ The brain tissue is starved of oxygen, resulting in damage or even death of the tissue. ✓ (2)

(11)

3.2 3.2.1

H✓



T✓ K✓ P✓✓

Blacks: 28/276 x 360° = 36°✓
Whites: 85/276 x 360° = 112°✓
Coloureds: 81/276 x 360° = 104°✓
Indians: 82/276 x 360° = 108°✓

Criteria	Mark allocation
Calculations to determine proportion(C)	4
Suitable heading (H)	1
Correct type (T) of the graph	1
Key (K) to indicate proportions	1
Portions (P) correctly	1 mark = one to three correct portions constructed 2 marks = all four portions accuratly constructed

(9)

3.2.2 White South Africans✓ (1)
(10)

3.3 3.3.1 2: Tricuspid valve✓ (1)
3: Right atrium✓ (1)
6: Pulmonary artery✓ (1)

3.3.2 The blood from the left ventricle must be pumped to the rest of the body✓ while blood form the right ventricle is pumped to the lungs only✓ (2)

3.3.3 **Atrial systole**
- Atrial muscles contract✓ while
- Ventricle muscles remain relaxed✓
- Deoxygenated blood✓ is forced from the right atrium into the right ventricle✓
- Oxygenated blood✓ is forced from the left atrium into the left ventricle✓
- Bicuspid and tricuspid valves are open✓ while
- The semi lunar valves are closed✓ (Any 5) (5)

(10)

3.4 3.4.1 T✓

Forest biome	Succulant Karoo biome
Large trees and shrubs, dense ✓	No large trees, just shrubs, widely distributed✓
Layering of trees, shrubs, grass✓ / canopy, woody shrubs, ferns, herbaceous bulbs	No layering of trees and shrubs✓/ plants widely distributed
Leaves are large/ developed into climbers / epiphytes in trees / ✓	Leaves are small / developed into thorns / waxy cuticle / reduced stems / storing water ✓

(Table 1 + Any 2 x 2) (5)

3.4.2 (a) C✓- Fynbos✓ (2)
(b) G✓- Savanna✓ (2)
(9)
[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

***Pollution (P)✓:**

- Harmful substances released into the environment affect the physical, chemical and biological environment✓.
- They affect plant and animals life✓ and then disrupt the food chain✓ by releasing poisonous substances that cause diseases✓ and kill organisms and populations decreases✓/becomes endangered/extinct.
- Climatic change results in natural disasters✓ (hurricanes, tornadoes, drought, tsunami etc.) that cause mass destruction or extinction✓.

(1 compulsory* + any 2) (3)

Management:

- Reducing - cutting down on the amount of waste we make✓.
- Reusing - using something for several times✓.
- Recycling – turning the waste into something more useful✓.

(Any 2) (2)

***Habitat destruction by humans (H)✓:**

- The entire habitat is destroyed✓,
  reduction in population size✓,
  organisms moving to another area,
  organisms become endangered and faces extinction✓
- Over-exploitation result in a decrease in the population✓ size.

(1 compulsory* + any 1) (2)

Management:

- To rehabilitate the area✓
- Not to over-exploit resources✓ and
- To put control measures in place✓ such as licenses and penalties.

(Any 2) (2)

***Climate change (C)✓:**

- Climate change due to ozone depletion and global warming✓,
  reduces photosynthesis✓ in plants and
  slows down plant growth✓ and
  food production reduced✓.
- Reduction of numbers/types of organisms✓ causing
- Food chain disruption✓.

(1 compulsory* + any 1) (2)

Management:

- Reduce burning of fossil fuels✓.
- Afforestation✓.
- Use nuclear energy, wind and solar energy✓.

(Any 2) (2)

***Invasion by alien species (I)✓:**

- Compete with indigenous species✓ since there are no natural agents✓ to control their numbers.
- They reproduce rapidly✓ and out compete indigenous species✓.
- Population size of indigenous species reduced✓, species endangered✓/ become extinct.

(1 compulsory* + any 1) (2)

Management:

- Mechanical control✓ - eradication of alien species through felling, uprooting and burning of invaders✓.
- Chemical control✓ - some chemicals are very specific and will kill only the selected invader✓.
- Biological control✓ - by introducing disease causing organisms like fungi or insects that feed on the invader to control the plant population✓.
- Over use of pesticides and fertilizer✓.
- Over exploitation ✓.

(Any 2) (2)

RUBRIC TO ASSESS 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 sequence	All aspect required by the essay have been sufficiently addressed
In this essay	Only information relevant to ways on how biodiversity is threatened by man and explanation on how such threats can be managed	Logic in all the facts relating to ways on how biodiversity is threatened by man and explanation on how such threats can be managed	All FOUR topics are thoroughly described: **P = 4/5** **H = 3/4** **C = 3/4** **I = 3/4**
Mark	**1**	**1**	**1**

Content = 17
Synthesis = 3

TOTAL SECTION C: 20

GRAND TOTAL: 150