

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**LIFE SCIENCES P2
PREPARATORY EXAMINATION 2008
MEMORANDUM**

MARKS: 150

TIME: 2½ hours

This memorandum paper consists of 10 pages.

SECTION A**QUESTION 1**

1.1

- 1.1.1 D ✓✓
 1.1.2 C ✓✓
 1.1.3 D ✓✓
 1.1.4 C ✓✓
 1.1.5 B ✓✓ (5 x 2) (10)

1.2

- 1.2.1 Red Data List ✓
 1.2.2 Micro-evolution ✓
 1.2.3 CFC ✓
 1.2.4 Biodiversity ✓
 1.2.5 Outbreeding ✓ (5 x 1) (5)

1.3

- 1.3.1 H ✓
 1.3.2 F ✓
 1.3.3 A ✓
 1.3.4 C ✓
 1.3.5 G ✓ (5)

1.4

- 1.4.1 Sewerage ✓, industrial waste ✓, detergents ✓, animal waste ✓, fertilizers washed into rivers by rain ✓. Any 2 (2)
 1.4.2 Diarrhoea ✓ (1)
 1.4.3

- The researcher needs to visit clinics to collect statistics ✓
 - The researcher needs to visit hospitals to collect statistics ✓
 - Data should be collected from rural communities to gather information about number of reported cases of different diseases. ✓
 - Data should be accumulated and seasonally collected ✓
 - Type of water used should also be taken into consideration ✓
- Any 4 x 1 (4)

1.4.4

- Avoid swimming in or washing with contaminated water ✓✓
 - Use proper sanitation, be careful ✓✓
 - Sterilise/boiling drinking water ✓✓
- Any 2 x 2 (4)

1.4.5

- Provide proper ways to dispose of sewerage ✓ e.g use of VIP toilets, septic tanks, eradicate bucket system. ✓
- Animal waste on farms ✓ should be used as fertilizers ✓ or manage animal waste from farms. /Fencing of camps to keep animals out of rivers.

- Enforce harsh penalties on industries ✓ that release waste into rivers and streams. ✓
- Effective treatment of liquid waste ✓ from domestic and industrial sources ✓
- Monitor rivers ✓ to find source of water pollution early ✓

Any 2 x 2 (4)

1.5

1.5.1

HUMAN	CHIMPANZEE
Foramen magnum more central / in the middle/ Spinal cord exits underneath skull ✓	Foramen magnum at back of skull /Spinal cord exits at the back of skull ✓
Rounded / bigger skull ✓	Narrower / smaller skull ✓
Small canines ✓	Large canines ✓
No gap between teeth ✓	Gaps between teeth ✓
Dental arch /teeth arrangement more rounded ✓	Dental arch / teeth arrangement more rectangular ✓
Pelvis wide/ bowl shaped ✓	Pelvis tall / narrow ✓
Sacrum bigger / shorter ✓	Sacrum longer / narrow ✓

Any 4 x 2

Tabulate ✓ +1

(9)

1.5.2 Human ✓ and Australopithecus ✓

(2)

1.5.3 The foramen magnum of both Human and Australopithecus is placed in the middle of the skull ✓ adaptation for upright walking/bipedalism ✓

(2)

1.5.4 Human has larger skull ✓/brain than Australopithecus / rounder skulls

Any 1 x 2

(2)

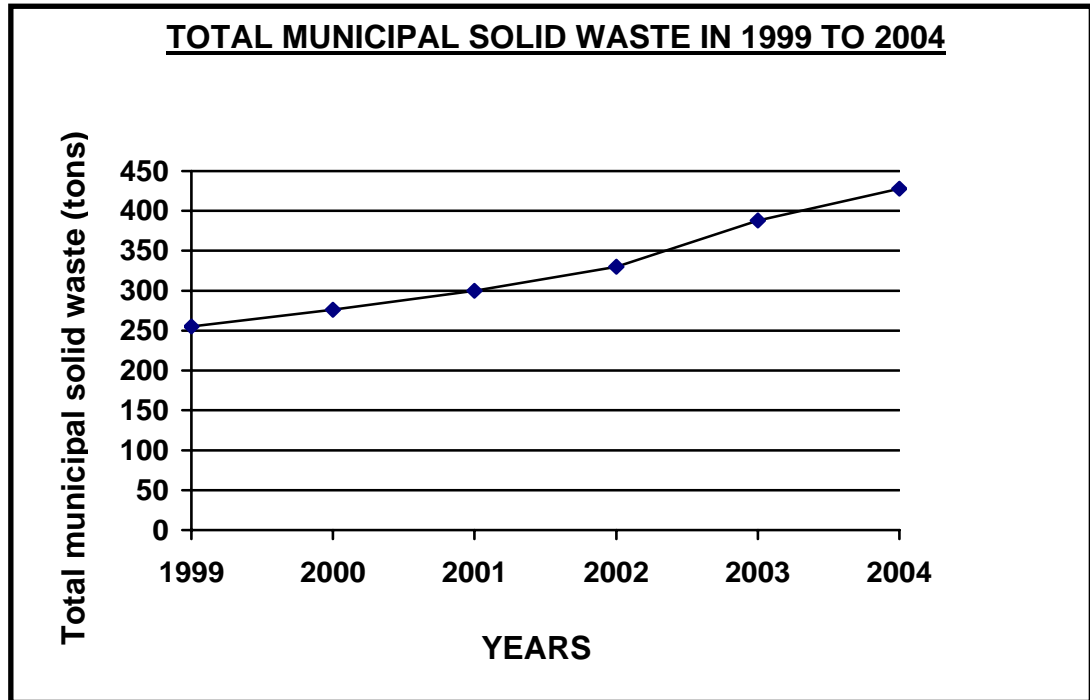
TOTAL SECTION A: 50

SECTION B

QUESTION 2

2.1

2.1.1



Criteria	Mark allocation		
Correct type of graph	1		
Title/caption of graph	1		
Variables correct axis, year on X and waste on Y	1		
Appropriate scale x-axis and label	1		
Appropriate scale y-axis	1		
Correct label for y-axis	1		
Correct unit on y-axis	1		
Plotting	3	2	1
	All 6 points correct	3-5 points correct	1-3 points correct

(10)

2.1.2 There is an increase ✓/ higher / accelerated production of MSW over time ✓/years (2)

2.1.3 2004 ✓ (1)

2.1.4 $(388 - 300) \checkmark = 88 \checkmark$ tons ✓ (3)

- 2.1.5 Household waste ✓
Industrial waste ✓
Medical waste ✓
Agricultural waste ✓ Any 2 (2)
- 2.1.6 Construction of landfills ✓ Could create negative impact on environment ✓
Recycling of materials such as glass, plastic, metal ✓ Decrease impact on environment ✓
Construction of rubbish dumps ✓ Negative impact on environment ✓
Combustion ✓ Positive on land pollution, but negative on air pollution ✓
Composting ✓ Positive impact on environment ✓ Any 2 x 2 (4)
- 2.2 Bio-degradable: The ability of a substance to be broken down ✓ into simpler substances by the natural process of decay – example: crop wastes ✓, etc.
Non biodegradable: Substance can't ✓ be broken down into simple substances by the natural process of decay – example: heavy metals ✓/
radioactive materials Any 2 x 2 (4)
- 2.3 The *Glossopteris* lived on Gondwanaland / Pangaea ✓ millions of years ago when all landmass was one continent. The continents are on separate tectonic plates ✓ which drifted apart due to continental drift ✓ / volcanic activity. *Glossopteris* went extinct and remains are found on different continents ✓ which when put together will show one habitat ✓ Any 4 (4)

TOTAL QUESTION 2: 30**QUESTION 3**

- 3.1
- 3.1.1 The serum contains antibodies ✓ against chimpanzee protein ✓ (2)
- 3.1.2 Pig, ✓ it only forms an very low % ✓ precipitate when the blood is exposed to serum. (2)
- 3.1.3 A high percentage ✓ of precipitate formed indicates a close relationship ✓ with chimpanzees
OR
A low percentage ✓ of precipitate formed indicates a no ✓ relationship with chimpanzees
OR
A high percentage ✓ of precipitate formed indicates a weak ✓ relationship with chimpanzees
OR
A low percentage ✓ of precipitate formed indicates a strong ✓ relationship with chimpanzees (2)
- 3.1.4 Temperature ✓, pH ✓, concentration of serum ✓
amount of serum and blood the same ✓ Any 2 (2)

3.2

- 3.2.1 Carboniferous period ✓✓ (2)
- 3.2.2 Yes, ✓ they evolved from a common ancestor ✓
OR
No, ✓ they evolved separately from common ancestor ✓ (2)
- 3.2.3 Dinosaurs ✓ (1)
- 3.2.4 Relative dating: ✓ Fossil age is estimated relative to other layers ✓
/ bottom layer is older than top layer
Radiometric dating: ✓ Carbon-14 or Uranium-238 is used ✓
know how long it takes for these unstable elements to decay ✓
into other products ✓
calculate the number of atoms of a radioactive element and
their product in a sample ✓ can calculate how old that rock/
sample is ✓ Any 4 (4)
- 3.2.5 Ice ages ✓ caused by changed orbit of earth or continental drift ✓ /
Climates changed and animals could not survive or adapt/
Melting ice caused massive floods, tsunamis/
Mid atlantic ocean current stopped and no nutrients, energy,
heat or food distributed to world oceans
Asteroid ✓ comet, star collided with earth caused rock falls,
earth quakes, tsunamis killed many and dust clouds covered
the sun ✓ No photosynthesis / plants died and all after that
Volcanic activity ✓ massive rock falls, dust covered earth, also
dust blocked out sun ✓ / no photosynthesis / cold no survival
Disease ✓ Flu or other bacterial, virus outbreaks ✓ / could
have caused mass extinction of several species
Any 2 x 2 (4)
- 3.3.1 A species is one or more populations whose members actually or
potentially interbreed ✓ under natural conditions, produce
fertile offspring ✓ and are reproductively isolated ✓ from other
such groups. (3)
- 3.3.2 Geographic speciation ✓
Physical isolation such as mountains turns a single population into two ✓
Once two populations are reproductively isolated, they are free to follow
different evolutionary paths ✓
Different geographic regions are likely to have different selective pressures ✓
such as temperature, rainfall, predators and competitors are likely to differ
between two areas ✓
Thus, over time, the two populations will differentiate ✓ to the point that
reunion of the two populations does not occur if contact is re- established ✓
The fate of the populations depends upon time and factors related to their
different environments ✓
Any 6 (6)

TOTAL QUESTION 3: 30
TOTAL SECTION B: 60

SECTION C**QUESTION 4**

4.1

- 4.1.1 A species of plant or animal that grows naturally ✓ in that habitat. It is not planted there or brought in and found nowhere else ✓ (2)
- 4.1.2 It was the same unit used in 1995 and in 2000 ✓ / It can be compared easily / Less variables to work with. (1)
- 4.1.3 fynbos plants: 171 ✓ Port Jackson Willow plants: 38 ✓ (2)
- 4.1.4 In 2000 the fynbos decreased ✓ while the alien plants increased ✓
In 2005 the fynbos increased to more than in 1995 ✓, while alien plants decreased to lower than 1995 ✓ (4)
- 4.1.5 The legislation and projects were partly ✓ successful ✓ / it is not completely solved (2)

4.2

4.2.1 Natural selection – those organisms with the most beneficial ✓ traits are more likely to survive and reproduce ✓. (2)

4.2.2 Organisms produce more offspring ✓ than can survive. These organisms compete for limited resources ✓

There is variation ✓ in populations. Organisms change over time, those living today are different to those who lived in the past ✓, i.e.

Change is gradual and slow, taking place over a long time ✓

The mechanism of evolutionary change was natural selection ✓

All organisms are derived from common ancestors ✓ by a process of branching, i.e. organisms pass genetic traits to the next generation ✓

Any 6 (6)

4.2.3 (a) Comparative anatomy
The arm of a human and the flipper of a dolphin perform different functions ✓, yet the type and arrangement of bones are similar ✓ called homologous structures ✓ reveal that they may have evolved from a common ancestor ✓ Closely related species have more common structures like horses and zebras ✓
Any 3 (3)

(b) Comparative embryology
Embryology is the study of stages of organism's development before birth. The embryos of all vertebrate groups are amazingly similar ✓ They all have gill slits ✓ / fish like kidneys / two chambered heart / a nerve cord and a tail ✓ All these features stay intact in fish ✓, but the others develop in stages further and lose the ancestral (fish like) features ✓ In mammals the nerve cord develops into a closed spinal cord, lungs develop and the human embryo develops a 4 chambered heart and loses the tail ✓ The embryo passes through all the stages of its ancestor during its development ✓
Any 3 (3)

4.3 Consequences

They may become extinct ✓ Destruction of natural habitat and resources ✓ / disturbing eco system. (2)

Strategies

Set out legislation ✓ by conservation authorities to control removal ✓
Collect and distribute seeds ✓ to spread the number of plants over a wide area ✓

Domestic cultivation ✓ by traditional healers ✓ / nurseries.

Monitoring of the number of plants ✓ to ensure that they are not decreasing ✓

Any 4 x 2 (8)

Misconception

More research and clinical testing to be done ✓

Educate people ✓ to clear up misconception / false hope (2)

Synthesis:

1	2	3
Significant gaps in the logic and flow of the answer	Minor gaps in the logic and flow of the answer	Well structured, demonstrates insight and understanding of the question

Content = 12
Synthesis = 3
[15]

TOTAL SECTION C: 40

GRAND TOTAL: 150