NATIONAL SENIOR CERTIFICATE EXAMINATION
MAY 2022

LIFE SCIENCES: PAPER II

MARKING GUIDELINES

Time: 2 hours 100 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A

QUESTION 1

1.1 1.1.1 C

1.1.2 B

1.1.3 D

1.1.4 A

1.2
- Area is drought prone
- therefore growth or number of the plants is limited by scarcity of water

1.3 1.3.1 Secondary
- The succession occurs on an area where plants had previously grown/after a major disturbance.
- Plants and animals recolonise a habitat after a major disturbance /natural disaster.
- It occurred in a place where there was already soil, i.e. not bare.
- Rock/plants were growing there before/soil was present.

1.3.2 Table showing comparison between primary and secondary succession.

Primary	**Secondary**
Occurs on bare rock/ash/soil	Occurs on existing soil
Pioneer plants include lichens, mosses	Pioneers include annual/ herbaceous plants
Slower	Faster rate

Column headings provided (can also be row headings)
Answers in the table must be comparative

1.4 1.4.1
- Fire is needed to release seeds from some plants
- Fire is required to recycle nutrients
- to clear area of dead vegetation

1.4.2
- Severity will increase
- as there is less rain predicted
- change in severity of droughts/conditions required for a fire
- higher temperatures predicted
- therefore more chance of fires
  (answer must relate to climate change)
  i.e. 1 for climate change effect, 1 for effect on fire regime

1.4.3
- The higher the biomass of alien vegetation
- the more intense the fires

1.4.4
- Originally burnt regularly
- Regular burning cleared the excess dead vegetation and alien vegetation
- stopped in 1980s
- focus shifted to forestry management to prevent fires to protect urban developments
- therefore there is more vegetation to burn in a fire

(At least 1 mark for before changes and at least 1 mark for after changes in burning regime)

1.5
- more chance of someone setting a fire as there is more vegetation to burn
- more space cleared for development and agriculture
- more alien vegetation invading from gardens, possible extinction of species

1.6
A Bracken
B Bobartia
C Conebush
D Blushing Bride

QUESTION 2

2.1 Yes
- there is a fence around the reserve
- no emigration or immigration can take place

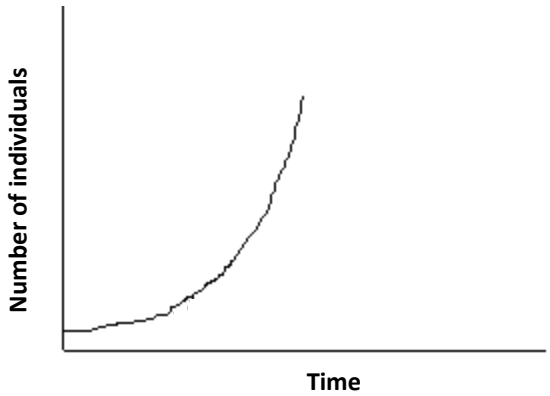
2.2 2.2.1
- Animals who live in groupings
- and either divide roles
- or get benefits such as protection.
- different castes (accept examples of different castes)

2.2.2
- They communicate well while hunting
- different wild dogs go hunting at different times
- lead dogs chase until they tire then others take over
- many attack at once so they can bring down large prey
- one bites lip to distract, others disembowel to kill prey quickly

(accept examples of above behaviours)

2.3
- They are more likely to agree to the protection of wild animals/vested interest in own future/feel empowered to make decisions about their livelihood
- to prevent poaching,
- ethical as these people originally made a living from this area,
- gives them more job opportunities, economic upliftment.
- Locals have more knowledge of the area

2.4 Heading: Graph showing the population growth curve of sable antelope
Two axes labelled
– lag phase shown
– exponential growth shown



2.5 2.5.1
- small sample size/only used 10 animals
- only done once/need to repeat/only done in one field,
- other organisms could have eaten the grass,
- other factors could have been responsible for change in grass biomass, e.g. competition

2.5.2 *Panicum maximum*/*Chrysopogon serrulatus*
- The smallest percentage *Chrysopogon serrulatus 10–13%*
- *Panicum maximum 18–20%*
- of these species of grass remains

2.6 2.6.1 **Yes** –
- makes money for conservation
- /animals hunted are not endangered
- /killed quickly
- maintain population size around carrying capacity

No –
- killing is not ethical
- /encourages poaching
- /supposed to be conserving animals not killing them
- could target endangered animals

(Accept other suitable answers)

2.6.2 Wildebeest
- the numbers of individuals are already above carrying capacity,
- therefore losing excess individuals means that there is less chance of wildebeest becoming threatened as a species/habitat being destroyed by excess wildebeest in the area (as they are above carrying capacity

2.7 resource partitioning
- Reduces competition when looking for food as they hunt at different times
- Lions diurnal (and brown hyena nocturnal)
- Lions are predators/hunters (and hyena are scavengers)

SECTION B

QUESTION 3

Yes, countries should control population growth	No, countries should not control population growth
Source A Population growth is exponential Have reached carrying capacity already Life expectancy is high Mortality rate is low optimum population of Earth is 1,5 to 2 billion people – not 7 billion as at present or 9 billion as expected in 2050 If population growth is not curbed, 'death rate solution' – death rate is raised through war, famine or pestilence Have to humanely and as rapidly as possible move to population shrinkage	**Source A** Life expectancy is high Mortality rate is low Carrying capacity dependent on lifestyle
Source B Poverty, carbon dioxide emissions increased pollution, drought Many people do not agree with contraception or abortion as a means to reduce population size	**Source B** Assist the economic development of poorer countries broadening access to education ensuring access to contraception and abortion
Source C Increase in population can result in warfare and genocide (e.g. Rwanda) Unemployment Less land for farming	**Source C** Immigration can deal with population decrease Fertility rates are at or close to the 'replacement rate' of 2,1 children per woman, rates are actually declining in many countries Cutting population results in too many older people. With fewer people, economic growth, stable finances and society structure become harder to maintain CAP as 1 if just list. Solutions include higher taxes, less generous welfare provision and later retirement CAP as 1 if just list. Immigration poses problems – xenophobia/ racism

Source D Singapore promotes sterilisation to reduce population growth Singapore's reproduction rate has fallen from 3,19 in 1957 to 0,765 – well below the replacement level of 1,025 Requires consent from the person undergoing sterilisation Right to have children 'responsibly' Childbearing at a level that poses no threat to either the environment or society Governments may justify limiting an individual's reproductive freedom on the grounds that uncontrolled childbearing threatens the collective welfare	**Source D** Singapore sterilisation mostly performed on females – sexist Can be abused – parents/spouses can give permission to have person sterilised Ethical objections to birth control programmes that use incentives of money, food or other benefits. Incentives violate the reproductive freedom of poor people Incentive programmes likely to work on poor people only Eugenics – tend to reduce certain classes and castes in society by causing them to have smaller families Programmes offend human dignity by treating children as a commodity Such programmes may encourage people to abort foetuses Women have the right to decide their number of children Reproductive rights include freedom from coerced (forced) sterilisation, abortion, and contraception. Control over their own reproduction is a basic need and a basic right for all women
Source E Ecological footprint of people on earth is high	**Source E**
Source F Anasazi people – starving and warfare due to population size Deforestation, depleted soils, erosio	**Source F**
Source G Cartoons and quotes are anecdotal Quotes express problems that are evident with population growth Increase in population cannot be supported by limited resources	**Source G** Cartoons and quotes are anecdotal
OWN Most population growth occurs in countries least equipped to meet rising demands on agriculture and the environment Discuss link between population growth and climate change Discuss link to how new pandemics happen with overpopulation Details of ecological footprint Discuss China's one-child policy Overconsumption, disposable society	**OWN** Discuss how older populations result in social problems (pensions, societal issues, less people working) Discuss xenophobia, etc. in SA Can discuss eugenics Discuss China's one-child policy Improving maternal and child health, nutrition and education and increasing access to and the use of modern family planning works better than coercion

Total: 100 marks

Note: Essay should be 2½ to 3 pages long.
Time allocation suggestion: Reading of sources 10 min.; Planning 10 min.; Writing essay 40 min.

	1 mark	2 marks	3 marks	4 marks	Possible mark (40)
Planning **× 2**	• Decision given • Key points present for and against the argument	• Decision given • Key points developed for and against the argument	• Decision given • Key points developed for and against the argument • Sources referenced (e.g. Source A/own information)		6
Decision	• Vague • Changed position within essay	• Clear decision made			2
Use of knowledge from sources **× 2**	• Up to ¼ of potential detail in sources used to support argument 1–2	• Up to ½ of potential detail in sources used to support argument 3–5	• Up to ¾ of potential detail in sources used to support argument 6–8	• Source detail – very close to full potential used to support argument 9+	8
Use of own knowledge	• Some facts beyond the source given to support argument	• Many facts beyond the source given to support argument	• Some facts beyond the source given to support argument • Facts integrated into the argument	• Many facts beyond the source given to support argument • Facts integrated into the argument	4
Content relevance	• Repetition mostly avoided • Some minor digression • Supporting argument relevant	• Repetition mostly avoided • Some minor digression • Supporting argument relevant • Quality of source extracts acknowledged			2

	1 mark	2 marks	3 marks	4 marks	Possible mark (40)
Quality of argument supporting decision × 2	• Writing consists of facts with little linkage or reasoning • Reasoning incorrect	• **Maximum if no clear decision in support** • Reasoning correct, but hard to follow • Ordinary: some linkage evident	• Supports the position • Reasoning is clear • Minor errors in flow • Linkage sometimes missed	• Strongly supports a clear position • Reasoning is very clear and succinct • Flow is logical • Compelling with regular linkage • Well-integrated argument	8
Fairness – counter opinions to decision	• One to two counter opinions given from the sources	• Three to four counter opinions given from the sources	• Integration of one to two counter opinions from the sources into argument	• Integration of three to four counter opinions from the sources into argument	4
Presentation	• Writing is almost unintelligible • Tone, language, terminology unscientific and very weak • Introduction **and/or** conclusion **not** present	• Tone, language, terminology weak • Introduction **and** conclusion present	• Tone is consistent and suited to scientific language • Good and appropriate language and terminology • Mostly appropriate paragraphing • Introduction and conclusion have merit	• Tone is mature and suited to scientific language • Excellent and appropriate language and terminology • Correct paragraphing with good transitions • Interesting introduction, satisfying conclusion	4
Scientific merit	Essay shows academic rigour, accurate reasoning, insight and cohesiveness.				2