



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2016

LIFE SCIENCES: PAPER II

MARKING GUIDELINES

Time: 2 hours

100 marks

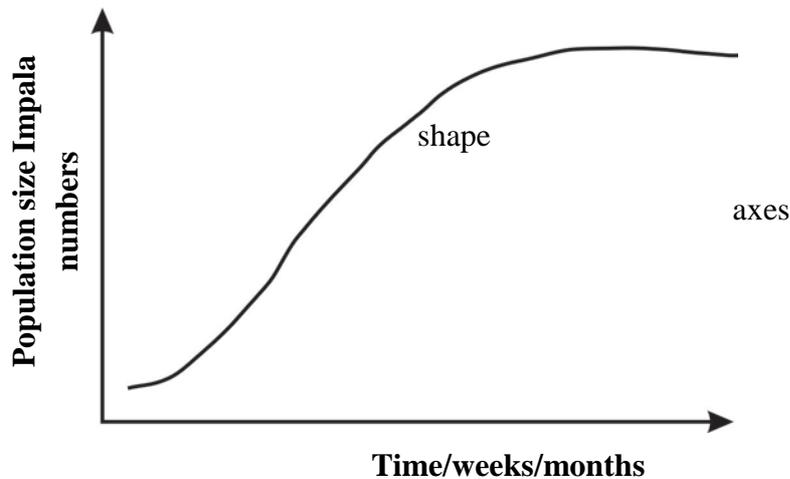
These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

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 interspecific competition (1)
- 1.1.2 resource partitioning/niche partitioning (1)
- 1.1.3 secondary succession (1)
- 1.2 1.2.1 closed – fences have been erected around reserve (2)
- 1.2.2 (a) immigration (1)
- (b) **Logistic growth/ S shaped/ sigmoid curve of impala**



- 1.3 1.3.1 vegetation/trees would become scarce/damaged; young, old and infirm giraffe would start dying/starving fewer giraffe births; giraffe would become thin/weaker/poor condition; aggression in adults increase in predator population ; increase in disease (2)
- 1.3.2 culling; to shoot excess numbers; selling giraffe to other reserves; introducing larger predators to feed on them; giraffe contraception to reduce numbers open up to hunting to reduce numbers/ to kill excess (2)
- 1.3.3 census/aerial photographs; animals are large enough to be easily seen/ counted (2)
- 1.4 Hunting at different times of day avoid chasing same prey; leopards kill buck; scavengers eat leftovers territorial behaviour – protection of food sources
Other suitable answers. (2)
- 1.5 **No/do not agree:** re-establish overgrazed land; prevent erosion; returning natural habitat; allows increase in biodiversity; investing in training local workforce; increase skills of people; education/conservation programmes to teach about wildlife; research done on indigenous plants and animals.

Yes/agree: land should be reclaimed for farming; is an important agricultural area; SA has a shortage of arable land; increasing population could lead to food shortages; farm not open to public/tourists, so no benefit to locals; human interference could have negative consequences in long run, e.g. lead to culling. (4)

- 1.6 1.6.1 predator-prey/predation predatory (1)
- 1.6.2 (a) shows the amount of the producers/food for the impala; helps to give a clearer understanding of all the factors that influence the size of the impala population; gives better understanding of the relative mass of grass/producers supporting this food chain reflect balance of resources between in food chain; allows one to see whether the impact on impala is due to predation/food i.e. an elaboration of the balance (2)
- (b) the impala numbers had increased and more grass was eaten (2)
- 1.6.3 individual/single grass plants would be very large numbers; gives a more accurate reflection of how much grass supports the impala population biomass is an indicator of energy requirements at each trophic level (2)
- 1.6.4 $550 - 600 \text{ kg} (\div 45 \text{ kg})$
 $= 12/13 \text{ leopard}$ (2)
- [30]**

QUESTION 2

- 2.1 2.1.1 they have a division of labour/different jobs are done by a variety of bees/ there are different castes/queen, drones and workers are present/queen lays eggs while workers do different jobs either a description of a job or mention of the fact that there are different jobs (1)
- 2.1.2 bees ensure seed production/the continuation of plants/pollination i.e. food for livestock; plants produce food for humans/other animals such as livestock/without bees there would be no food for livestock (and therefore humans)/food security (2)
- 2.2 2.2.1 Drones (1)
- 2.2.2 Propolis (1)
- 2.2.3 Pollination (1)
- 2.2.4 CCD (1)
- 2.3 2.3.1 increase until 1960/61; then decline until 1988–89 after which it increases slightly until 1992/3 (max 2) (2)
- 2.3.2 1992/3–1997/1998 (1)
- 2.3.3 2040–2055 (1)
- 2.3.4 density-dependent – many bees close together in a nest cause the disease to spread more quickly (2)

2.4 2.4.1 **Table showing stages in the life cycle of worker bees and their roles in the colony**

Age/stage of worker bee (weeks)	Role/job
1/birth–1	Clean out dirty honeycomb; feed larvae
2/1–2	Build honeycomb; collect food from foragers
3/2–3	Guard the hive; remove corpses
3–5/7	Forage for nectar, pollen, water
5–7	Dies

Heading:

Headings of columns:

Age ranges all correct:

Correct jobs: 1–2 correct 3–5 correct

(5)

2.4.2 patrol and defend territories; become very aggressive if threatened; signalling behaviour head butting to show aggression/ward off threat/foreign bees; need to protect their food supply and nectar when there is a shortage of nectar-producing flowers (How and why must be linked)

(4)

2.5 **Disease:** American Foulbrood disease is a highly contagious disease; AFB destroys entire colonies; as there is no known cure it could wipe out all SA's bees/hives can be destroyed/reducing the number of bees pollinating of crops will not take place less food for South Africans spores can survive for half a century/40% bees killed in W Cape already this year; disease infects embryos

OR

Access to food for bees: Expansion of urban areas into viable forage land is greatly affecting access to food for bee colonies/can lead to many bees dying of starvation; pollinating of crops will not take place = less food for South Africans. no space for nests

Answer must be integrated – explanation of threat good elaboration of importance to SA

(3)

2.6 2.6.1 large mammals/big five are tourist attractions/bees are small, not highly visible insects/bees annoyance to humans/size leads to them being overlooked/small number of rhino (other suitable answer)

(1)

2.6.2 more important to conserve bees; as whole food chains/food resources for most animals depend on bee pollination; endangered mammals dying out will not directly influence our livelihood/remaining alive; bees have much greater role in maintaining biodiversity

(4)

[30]

60 marks

QUESTION 3 ESSAY**MEMO**

FOR POLICY	AGAINST POLICY
A: <ul style="list-style-type: none"> • Far more births than deaths. 	<ul style="list-style-type: none"> • Declining ages 5–19.
B: <ul style="list-style-type: none"> • Population approximately trebled since 1950. • Approximately 4 times greater population density. • 44 people per m² – stress of resources (Max 1 mark for use of stats) • 24th largest country in the world. 	<ul style="list-style-type: none"> • 2015 growth rate only 0,89%/slowing down. • SA density is much less than other countries.
C:	<ul style="list-style-type: none"> • Age dependency ratio unfavourable. • Pressure on productive population in South Africa is high. • Less than 50% responsible for the rest.
D: <ul style="list-style-type: none"> • Tsunami – world cannot support more people. • Resources are finite. • Growth rate exponential. 	
E: <ul style="list-style-type: none"> • AIDS/HIV no longer a death sentence. • Infant mortality rate has decreased, more babies surviving. • Life expectancy has improved. 	<ul style="list-style-type: none"> • Life expectancy has improved. • Overall standing of living has improved. • SA can afford more births. • AIDS still responsible for higher than normal no. of deaths • SA has high infant death rate • Life expectancy still not as high as 1990 level
F:	<ul style="list-style-type: none"> • Forced sterilisations and abortions • Unethical/against human rights
G: <ul style="list-style-type: none"> • Overpopulation. • Environmental degradation. • Migration and social instability. • Displacement of people. • Exceed sustainable foot print of 1,8 hectare. 	<ul style="list-style-type: none"> • Discrimination. • Need to control immigration, etc. as controlling birth rate is only 1 parameter that affects population size. • Population numbers not only influenced by birth rate but also by migration and war.

<p>H:</p> <ul style="list-style-type: none"> • Policy was effective. • Positive Impact of limiting children. • Policy led to drop in birth rate – effective • Indicate not many want large families. • Many children too expensive to raise. 	<ul style="list-style-type: none"> • Very intrusive • Increased abortion/infanticide • Won't ignite a baby boom • Would lead to an aging population • Economic concerns/labour shortage as seen in China • Could increase abortion/sterilisation rates, etc. (max 2) • Skewed sex ratio – very few females • Increased infanticide • Many people did not want large families • Many children – very expensive to raise
<p>OWN:</p> <ul style="list-style-type: none"> • Global warming; desertification = less arable land; leads to food insecurity. • Over-population lower carrying capacity • Exceed carrying capacity by 2050 • Shape of pyramid indicates increased demand on resources in future • Would reduce abuse of child grants • SA has limited work opportunities 	<ul style="list-style-type: none"> • Declining children will lead to less revenue = pressure on healthcare, pensions, etc. • Can lead to eugenics movements xenophobia, etc. • Social implications – spoilt children • Education can limit birth rate • Can lead to eugenics movements. (selective breeding to improve human genetic make-up) • Psychological/social impact to of one child families • Education can reduce birth rate • Can result in twins being separated at birth • Limit on birth rate won't lower SA footprint • Once carrying capacity is exceeded - numbers will drop anyway. • Certain religions don't believe in contraception or policies to limit the birth rate

Details will be expanded at standardisation of memo at marking session.

(Will include arguments for source facts in SA context. Relating source facts to SA context will be discriminator for scientific merit and an excellent essay.)

Using the SA context will lead to high integration of facts

Do not mark alternative solutions or discriminatory statements. Write FOR, AGAINST or NO DECISION at top of the page!

40 marks

Total: 100 marks

Note: Essay should be 2½ to 3 pages in length.

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	<ul style="list-style-type: none"> Decision given Key points present for and against the argument 	<ul style="list-style-type: none"> Decision given Key points developed for and against the argument 	<ul style="list-style-type: none"> Decision given Key points developed for and against the argument Source references identified (e.g. Source A/own information) 		6
Decision	<ul style="list-style-type: none"> Vague Changed position within essay 	<ul style="list-style-type: none"> Clear decision made 			2
Use of knowledge from sources × 2	<ul style="list-style-type: none"> Up to ¼ of potential detail in sources used to support argument (1–3) 	<ul style="list-style-type: none"> Up to ½ of potential detail in sources used to support argument (4–6) 	<ul style="list-style-type: none"> Up to ¾ of potential detail in sources used to support argument (7–9) 	<ul style="list-style-type: none"> Source detail – very close to full potential used to support argument (10) 	8
Use of own knowledge	<ul style="list-style-type: none"> Some facts given beyond the source to support argument (1) 	<ul style="list-style-type: none"> Many facts given beyond the source to support argument (1) 	<ul style="list-style-type: none"> Some facts given beyond the source to support argument Facts integrated into the argument (1) 	<ul style="list-style-type: none"> Many facts given beyond the source to support argument Facts integrated into the argument (1) 	4
Content Relevance	<ul style="list-style-type: none"> Repetition mostly avoided Some minor digression Supporting argument relevant 	<ul style="list-style-type: none"> Repetition mostly avoided Some minor digression Supporting argument relevant Quality of source extracts acknowledged 			2
Quality of argument supporting decision × 2	<ul style="list-style-type: none"> Writing consists of facts with little linkage or reasoning Reasoning incorrect 	<ul style="list-style-type: none"> Maximum if no clear decision in support Reasoning correct, but hard to follow Ordinary: some linkage evident 	<ul style="list-style-type: none"> Supports the position Reasoning is clear Minor errors in flow Linkage sometimes missed 	<ul style="list-style-type: none"> Strongly supports a clear position Reasoning is very clear and succinct Flow is logical Compelling with regular linkage Well-integrated argument 	8

	1 mark	2 marks	3 marks	4 marks	Possible mark (40)
Fairness – counter opinions to decision	<ul style="list-style-type: none"> One to two counter opinions given from the sources 	<ul style="list-style-type: none"> Three to four counter opinions given from the sources 	<ul style="list-style-type: none"> Integration of one to two counter opinions from the sources into argument 	<ul style="list-style-type: none"> Integration of three to four counter opinions from the sources into argument 	4
Presentation	<ul style="list-style-type: none"> Writing is almost unintelligible Tone, language, terminology unscientific and very weak Introduction and/or conclusion not present 	<ul style="list-style-type: none"> Tone, language, terminology weak Introduction and conclusion present 	<ul style="list-style-type: none"> Tone is consistent and suited to scientific language Good and appropriate language and terminology Mostly appropriate paragraphing Introduction and conclusion have merit 	<ul style="list-style-type: none"> 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