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   TRUE   (1)

       1.1.2   FALSE   (1)

       1.1.3   FALSE   (1)

1.2.   keystone species = important role in the ecosystem; zebras eat long grasses exposing short, sweet roots; loss of zebra will decrease biodiversity; disrupt food chains (max 2)   (2)

1.3   1.3.1   interspecific competition   (1)

       1.3.2   more grazing for zebra; more foals surviving; /population growing (max 2)   (2)

1.4   lions eat zebra; brown hyenas scavenge the leftovers   (2)

1.5.   1.5.1   (A two-metre high) electrified fencing (stretching kilometres across zebras' territory) will disrupt zebra migrations + *statement*   (3)

       1.5.2   manage zebra populations; attaching radio collars to mares' necks; tracking/recording their migration/ movements/monitoring population size and structure   (2)

       1.5.3   ensure zebra populations remain viable/large enough to support tourism (other suitable answers)   (2)

1.6.   1.6.1   one stallion + several mares + their offspring form a harem; stallion protects mares when in heat/from harm; mares loyal and can remain with harem for life/16 years/long time; live together and travel as a herd; form social units of 50 or more zebra (4 good facts)   (4)

       1.6.2   no division of labour with zebra wild dogs/social insects have different roles in the pack /wild dogs have one breeding pair (alpha female and male) social insects have castes with different jobs/one queen that reproduces *accept other suitable differences*   (2)

       1.6.3   lines distort zebra's outline/make animal look bigger, confuse predator   (1)

1.7.   1.7.1   density independent   (1)

       1.7.2   C
            Population growth curve decreasing from carrying capacity/zebra numbers dropping from carrying capacity as they die from drought.   (2)

       1.7.3   s-shaped/logistic/sigmoid   (1)

1.7.4   YES: more zebra surviving will place extra pressure on grass; this can degrade grass so that it cannot regrow; whole ecosystem will be under pressure and carrying capacity will go down; this will have long-term implications for herbivores/other grazers that could die out too NO: will help zebra survive only a short while as they look for other grazing lack of grass, which will be in short supply, will ultimately be the carrying capacity factor/environmental pressure/causing their death; a few extra water holes in such a large area will have no impact on long-term survival; lack of grass will cause them to die.
(Two good facts or one well explained.) (2)

[30]

QUESTION 2

2.1   2.1.1   endemic (1)
       2.1.2   population/species (1)
       2.1.3   predator-prey/predation (1)

2.2   they live on coast/sandy and rocky shores; make simple nests/shallow holes in sand to lay eggs; they eat marine organisms/feed on rocky shores; excrete nutrient rich guano; guano feeds algae; role is to control prey species in its area; they provide food for other predators (max 5) (5)

2.3   2.3.1   Near threatened (1)

       2.3.2   human disturbance = cars on beaches; introducing predators at breeding sites, e.g. domestic dogs eat young chicks; urban developments; mining disturbances; pollution; would prevent breeding/reduce population numbers/would reduce areas for breeding (3)

       2.3.3   **Yes:** must protect African Black Oystercatcher as it is a threatened species/ could become extinct if breeding sites are not protected

             OR

             No: beaches are public property and should be open to all for recreational activities control access *Any other suitable answers.* (2)

       2.3.4   educate public about importance of leaving nests/breeding sites alone (2)

2.4   2.4.1   all members of a "population" have equal chances of being selected and it eliminates bias/to ensure that the sample represents the true distribution. (2)

       2.4.2   Total 6 quadrats/m^2 = 5 + 2 + 3 + 4 + 8 + 1 = 23
                Ave in 1 m^2 = 23 ÷ 6 = 3,8
                Total area = 10 m^2 × 10 m^2 = 100 m^2
                Total no. of mussels = 100 × 3,8 = 380 (4)

       2.4.3   repeat the sampling more than once and average results; /don't let too much time lapse between sampling so births and deaths don't affect data
              Accept other suitable answers; not MIGRATION from area – move too slowly. (2)

2.5   2.5.1   A   (1)
A broad base showing a high birth rate;/small numbers of older people narrower bars   (1)

2.5.2   **Comparison of population pyramids ✓**

Population Pyramid A	**Population Pyramid C**
High dependent population	Young dependent population low
Low standard of living	High standard of living
High birth rate	Low birth rate/decreasing base of children
Poor medical care	High medical care
Less developed	More developed
Other suitable differences	

Heading row headings two differences   (4)

[30]

60 marks

SECTION B

QUESTION 3

ADVANTAGES TO SA OF FRACKING	DISADVANTAGES TO SA OF FRACKING
A: coal non-renewable Shale gas alternative to meeting energy demands/less reliance on fuel	**A:**
B: SA 5th largest gas reserves Won't have to import oil; will meet energy requirements	**B:**
C: burning coal, which increases global CO2; warming; air pollution will be reduced	**C:**

D: Eskom battling to meet SA energy requirements
     SA coal running out
     SA coal does bring in huge foreign exchange
     Fracking energy could be sold
	D:

E:	**E:** many side effects to fracking • Water pollution – SA water-scarce country • Air pollution – carcinogens • Noise and light pollution • Drought • Toxic chemicals (Elaboration of each = another mark)
F:	**F:** Karoo is a future World Heritage Site: • Ecologically sensitive • Desert biodiversity hotspot • Endemic succulents • Wide variety of insects and reptiles

G: Fracking will create jobs/relieve poverty
     Gas can provide 400 yrs of energy
     Provide a lot of money/R485 trillion
     Exploration is safe
	G:

H:	**H:** SA tourism revenue declines • Natural beauty that fracking will destroy • Palaeontology – rich fossil history in Karoo
OWN KNOWLEDGE: e.g. Businesses/economy will suffer with energy crises e.g. global warming	**OWN KNOWLEDGE:** e.g. destroying food chains/biodiversity e.g. effects future food stability e.g. palaeontology issues e.g. fissures in land

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	• 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 • Source references identified (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	• Up to ½ of potential detail in sources used to support argument	• Up to ¾ of potential detail in sources used to support argument	• Source detail – very close to full potential used to support argument	8
Use of own knowledge	• Some facts given beyond the source to support argument	• Many facts given beyond the source to support argument	• Some facts given beyond the source to support argument • Facts integrated into the argument	• Many facts given beyond the source 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
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

	1 mark	2 marks	3 marks	4 marks	Possible mark (40)
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