



NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2014

**LIFE SCIENCES: PAPER II**

**MARKING GUIDELINES**

Time: 2½ hours

150 marks

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**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.**

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**QUESTION 1**

1.1 Select the term in Column B that best matches a description in the Column A. Write the letter of the matching term in the corresponding space provided between the brackets.

Each letter may only be used once.

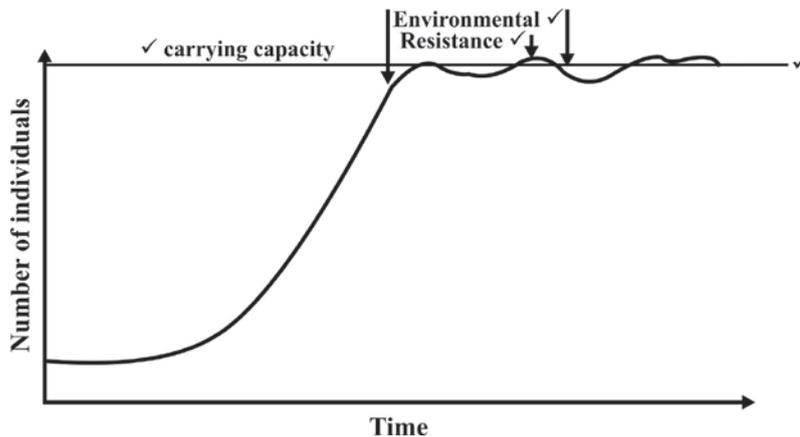
**Column A**

**Column B**

[E]	The reproductive hormone that remains at a consistently high level during pregnancy	A	Ovulation
[A]	Rupture of the Graafian follicle	B	Oestrogen
[G]	Attachment of the developing embryo as it sinks into the endometrium	C	Placenta
[J]	The most common site of fertilisation	D	Amnion
[I]	Process by which the embryo grows	E	Progesterone
[L]	Responsible for transport of foetal waste products	F	Meiosis
[C]	Acts as a barrier against pathogens and drugs	G	Implantation
[D]	A strong membrane around the embryo	H	Uterus
[K]	Substance that protects and cushions the foetus from impact injury	I	Mitosis
[H]	Labour is initiated by contraction of certain muscles in this organ	J	Oviduct
		K	Amniotic fluid
		L	Umbilical cord

(10)

1.2



**Graph to show the growth form of a population**

1.2.3 Food supply /shark attacks/predation/quality of water/aquatic factors/temperature of water. (1)

- 1.3 1.3.1 D (2)
- 1.3.2 A (2)
- 1.3.3 D (2)
- 1.3.4 C (2)
- 1.3.5 B (2)

1.3.6



Stigma

Anther

Filament or other correct label associated with sexual reproduction – style, ovary, petal, ovule

meaning [L/S section through a flower]

LS diagram of flower drawn

(5)

1.3.7 Results in genetic variation /adaptability to change in climate, etc./possible better resistance to disease/reduces inherited disease possibilities. (2)

1.3.8 Pollination is the transfer of pollen from anther to stigma.

Fertilisation is fusion of male and female gametes.

(4)

1.3.9 Pros. Cost-effective and timesaving since grafted/GMO/cloned saplings grow faster than seedlings reaching productivity earlier. Product (peach) quality is consistent for food markets.

Cons. Artificial process involving cost which is not case if nature takes its course/bees do their job. Reduction of genetic variation/fertility rates. Can result in huge crop loss from disease/pests. (Debate: 2 for pro + 2 for con)

(4)

[40]

**QUESTION 2**

- 2.1 2.1.1 population (1)
- 2.1.2 pioneer (1)
- 2.1.3 resource partitioning /type of partitioning (1)
- 2.1.4 ecosystem (1)
- 2.1.5 emigration (1)

- 2.2 2.2.1 An animal that captures/stalks/hunts kills other animals for food/eats (3)
- 2.2.2 The density (number per area) of the prey influences the density of the predator (and visa versa) and so they regulate each other's numbers. (3)
- 2.2.3 Zebra stripes tend to break up the form of individual animals in a herd and so confuse the lions/many animals moving in different directions/difficult for predator to choose one zebra to catch. (Any 3 logically connected points) (3)

- 2.3 2.3.1 legal bone exports/canned hunting /farmers/people/poaching (2)
- 2.3.2 2020 (1)
- 2.3.3 farmers shoot on sight whether or not habitual or opportunistic predators/ to protect livestock; bone exporters/to asian market canned hunting/specially bred lions released for hunting. (4)
- 2.3.4  $(100\ 000 - 32\ 000 = ) 68\ 000$  (2)

2.3.5 Education of farmers so that they shoot only habitual killers. Improve the containment of lions in reserves. /Make canned hunting/bone trade illegal./ Legal consequences/advertise the plight of the lions for increased awareness/relocate problematic lions/fundraising to prevent poaching/ breeding programmes like cheetah programme (Any 4) (4)

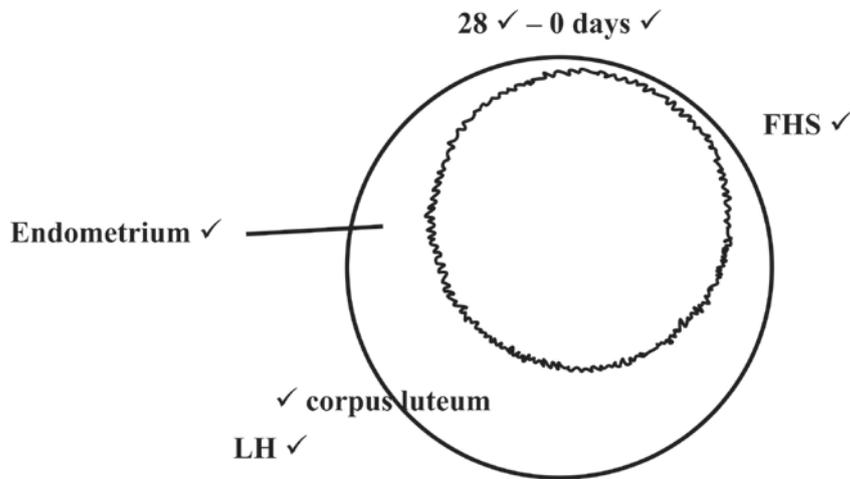
2.3.6 Lion is legal and rhino illegal resulting in more lion deaths. Or lion bone vs rhino horn Or canned hunting of lion vs poaching of rhino (3)

[30]

**QUESTION 3**

- 3.1 3.1.1 (a) production of milk/secretion or release of milk (1)  
 (b) prolactin/oxytocin Note: answer in (b) must match (a) (1)  
 3.1.2 She tested positive for a genetic mutation that gave her a high cancer risk. (3)  
 3.1.3 Yes. By undergoing the surgery she has ensured she will not get/die from breast cancer.  
 No. Few people have her money for the surgery/ reconstructive surgery./There can be complications with surgery/very painful operation. (Other logical answer) (2)
- 3.2 3.2.1 A vas deferens/sperm duct  
 B urethra  
 C epididymis (3)  
 3.2.2 D produces sperm/male gametes/testosterone  
 E produces/secretes fluid (to promote movement of the sperm)/provide nutrition/correct pH for the sperm (2)  
 3.2.3 Semen is a fluid containing sperm and secretions from the (accessory) glands/alkaline fluid. (2)
- 3.3 Ovulation which is the release of an egg from the ovary; menstruation which is the flow of the endometrium out of the body /Egg formation/describe hormonal changes (4)

3.4



Day 14 ✓ ovulation ✓ (8)

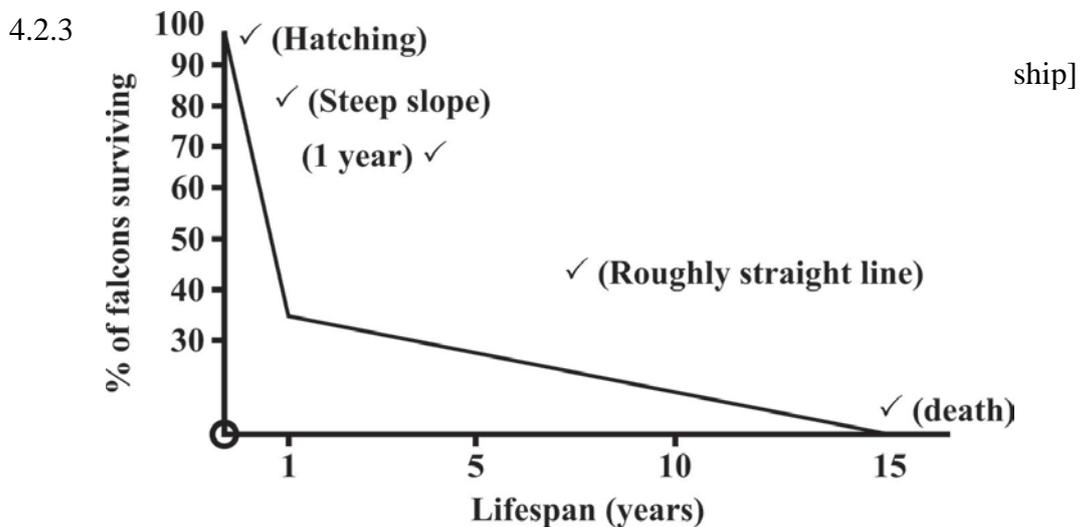
If candidate swings diagram, mark in relation to orientation. If 'days' is incorrect other information can be marked correct in relation to 14<sup>th</sup> day/ovulation.

- 3.5 TWO marks for use/application; TWO marks for how it prevents pregnancy  
 Male condom – fits over an erect penis and must be applied before copulation; it catches the semen and prevents the sperm reaching the egg.  
 OR  
 Female condom – fitted inside the female before sex to line the vagina; it prevents the sperm travelling up through the cervix to fertilise an egg.  
 OR  
 Diaphragm – fitted inside the female to cover the opening in the cervix; it prevents the sperm travelling up through the cervix to fertilise an egg. (4)

[30]

**QUESTION 4**

- 4.1 4.1.1 A (protein) chemical/steroid/metabolic regulator; produced in one part of the body and controls activity of another/messenger (2)
- 4.1.2 Pancreas/islets of Langerhans (1)
- 4.1.3 C (1)
- 4.1.4 Lowers the level of the blood sugar/makes cell membranes more permeable to glucose/increases the rate at which glucose is convert to glycogen in the cells (liver/muscles) (any TWO connected points) (2)
- 4.1.5 (a) Exercise/fright/stress/an example (1)
- (b) As the level of glucose goes down so the level of glucagon goes up ;/as glucagon goes up so blood sugar goes up;/as blood sugar goes uo the glucagon goes down (2)
- (c) negative feedback (look at (b) in case 'positive' applies) (1)
- 4.2 4.2.1 (a) internal fertilisation (1)
- (b) ovipary (1)
- 4.2.2 nesting on high cliffs (safe from predators ); territory protection (protects food sources ); shared incubation/shared feeding/parental care (so young get better nourishment/warmth) ;Courtship (species fitness) ; internal fertilisation (better chances of sperm and egg meeting) ; K strategy (few offspring to ensure survival) ; mate for life (less energy used for seasonal courtship) (4)
- (Any 2 point combinations) (4)



Survivorship Curve of the Peregrine Falcon (5)

- 4.2.4 Many chicks did not get to hatch since eggs broke during incubation (Or other sensible answer) (2)
- 4.2.5 (a)  $\frac{20 \times 24}{8} = 60$  (3)
- (b) The time between the first and second capture was too long, i.e. a year lots of deaths; migration of birds makes this method invalid/not a closed population due to migration; lack of sampling/too few initial captures/lack of average carried out in the breeding season not a stable population (4)

**[30]**

**QUESTION 5**

The IEB standard rubric will be used to assess the responses to the question – which is open ended.

The following are guidelines to the content and sources relevant to either argument.

<b>Rubric reference</b>	<b>I DO think</b>	<b>I DO NOT think</b>
Support argument assisted with the following sources	Source C (pyramid of 2013), Source D, Source E	Source A; B; C (pyramid of 1991, graph), Source F, G
Argument against noted using some information from the following sources	Source A; B; C (pyramid 1991, graph), Source F, G	Source C (pyramid of 2013), Source D, Source E

**[20]**

	<b>1 mark</b>	<b>2 marks</b>	<b>3 marks</b>	<b>4 marks</b>
<b>Content: Thoroughness</b>	<ul style="list-style-type: none"> <li>Up to 1/3 of potential detail in sources cited (e.g. 1 to 4 facts)</li> </ul>	<ul style="list-style-type: none"> <li>About half of potential detail in sources cited (e.g. 4 to 8 facts from sources)</li> </ul>	<ul style="list-style-type: none"> <li>All main topics in sources covered</li> <li>About ¾ of potential detail in sources cited (e.g. 9 to 12 facts = 11 + 1 original fact*)</li> <li>One instance of significant information beyond the sources.</li> </ul>	<ul style="list-style-type: none"> <li>All main topics covered</li> <li>Source detail very close to full potential</li> <li>At least (x) significant instances of information beyond the sources (e.g. 13 – 16 facts; 2 must be original &amp; beyond the sources) = 11/14 + 2</li> </ul>
<b>Content: Relevance</b>	<ul style="list-style-type: none"> <li>Mostly digression and/or repetition</li> </ul>	<ul style="list-style-type: none"> <li>Around half is digression and/or repetition</li> </ul>	<ul style="list-style-type: none"> <li>Repetition mostly avoided</li> <li>Some minor digression</li> <li>Argument relevant</li> </ul>	<ul style="list-style-type: none"> <li>Isolated incidences of minor repetition</li> <li>No digression</li> <li>Argument relevant</li> </ul>
<b>Supporting Argument i.e. for</b>	<ul style="list-style-type: none"> <li>Writing consists of facts with little linkage or reasoning</li> <li>Reasoning incorrect</li> </ul>	<ul style="list-style-type: none"> <li><b>Maximum if no clear decision to support</b></li> <li>Reasoning correct, but hard to follow</li> <li>Ordinary; some linkage is evident</li> </ul>	<ul style="list-style-type: none"> <li>Supports the position</li> <li>Reasoning is clear</li> <li>Minor errors in flow</li> <li>Solid but not compelling; linkage sometimes missed</li> </ul>	<ul style="list-style-type: none"> <li>Strongly supports a clear position</li> <li>Reasoning is very clear and succinct</li> <li>Flow is logical, showing evidence of clear planning</li> <li>Compelling with regular use of linking language</li> </ul>
<b>Fairness i.e. Argument against</b>	<ul style="list-style-type: none"> <li>One counter-opinion given</li> </ul>	<ul style="list-style-type: none"> <li>Two counter-opinions given</li> </ul>	<ul style="list-style-type: none"> <li>Three or more counter-opinions given</li> </ul>	
<b>Position</b>	<ul style="list-style-type: none"> <li><b>Clear decision made</b></li> </ul>			
<b>Presentation</b>	<ul style="list-style-type: none"> <li>Writing is almost unintelligible</li> <li>Tone, language and terminology unscientific and exceptionally weak</li> <li>Introduction <b>and/or</b> conclusion <b>not</b> present</li> </ul>	<ul style="list-style-type: none"> <li>Tone, language and terminology is weak</li> <li>Attempts at correct paragraphing</li> <li><b>Introduction and conclusion</b> present, no matter how weak</li> </ul>	<ul style="list-style-type: none"> <li>Tone is consistent and suited to scientific argument</li> <li>Good and appropriate language and terminology</li> <li>Mostly appropriate paragraphing</li> <li><b>Introduction and conclusion</b> have merit</li> </ul>	<ul style="list-style-type: none"> <li>Tone mature and suited to scientific argument</li> <li>Excellent and appropriate use of language and terminology</li> <li>Correct paragraphing with good transitions</li> <li>Interesting <b>introduction</b>, satisfying <b>conclusion</b></li> </ul>

**Total: 150 marks**