NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2011

LIFE SCIENCES: PAPER II

MARKING GUIDELINES

Time: 2½ hours 150 marks

These marking guidelines were used as the basis for the official IEB marking session. They were prepared for use by examiners and sub-examiners, all of whom were required to attend a rigorous standardisation meeting to ensure that the guidelines were consistently and fairly interpreted and applied in the marking of candidates' scripts.

At standardisation meetings, decisions are taken regarding the allocation of marks in the interests of fairness to all candidates in the context of an entirely summative assessment.

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, and different interpretations of the application thereof. Hence, the specific mark allocations have been omitted.

QUESTION 1

1.1

	Column A		Column B
[B]	Female hormone secreted by the ovary	A	Amniotic fluid
[J]	Rapid increase in the levels of this hormone causes ovulation	B	Progesterone
		C	Zygote
[E]	Gland at the base of the male bladder	D	Endometrium
[K]	Place where fertilisation normally occurs in humans	E	Prostate gland
[A]	Protects the foetus	F	Placenta
[C]	A fertilised egg	G	Testosterone
[F]	Provides nutrients and oxygen to the foetus	H	Epididymis
[L]	An organ enclosed by the scrotum	I	FHS
[D]	Lining of the uterus	J	LH
[G]	Stimulates development of male characteristics	K	Oviduct
		L	Testis
		M	Vagina

(10)

1.2 Six multiple choice questions are given below. Choose the most correct alternative in each question and write the letter in the space provided in the table.

Question	**1.2.1** (1)	**1.2.2** (1)	**1.2.3** (2)	**1.2.4** (2)	**1.2.5** (2)	**1.2.6** (2)
Answer	**B**	**C**	**B**	**C**	**C**	**A**

(1)

1.3 Give the correct biological term for each of the following descriptions. Write the term on the line provided.

A sticky fluid containing secretion produced by glands and mixed with sperm. *Semen*

Release of fluids and sperm by the penis. *Ejaculation*

Organ containing a Graafian follicle. *Ovary*

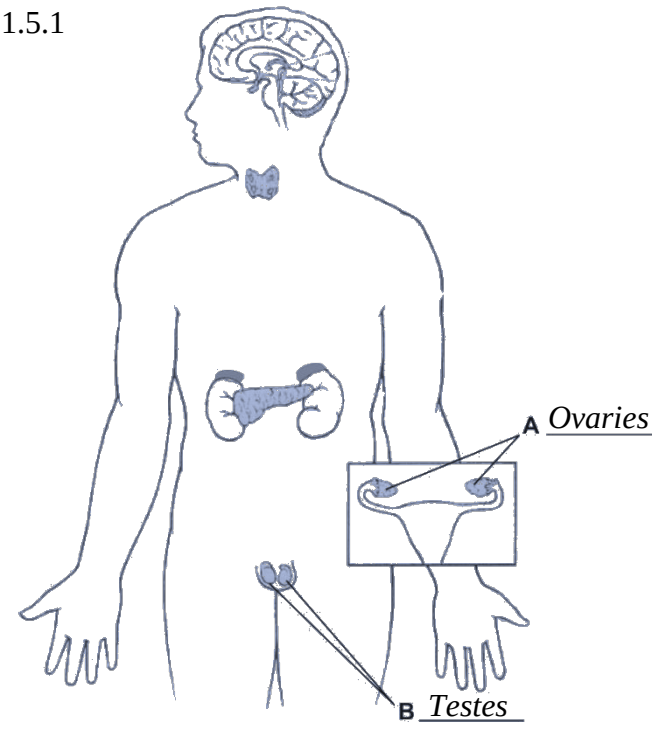
Swelling of the penis with blood when sexually aroused. *Erection* (4)

1.4

Answer	Item	Statement
B	1. Glucagon 2. Insulin	Converts glucose into glycogen
C	1. Controlled by aspects of the nervous and endocrine systems. 2. Effectors respond by adjusting the levels of the substance to restore balance.	Negative feedback
D	1. ADH 2. Growth Hormone	Controls the rate of metabolism
A	1. Thyrotropin (TSH) 2. Thyroxine	Is secreted by the pituitary gland
D	1. Glucagon 2. Adrenaline	Very high levels of blood sugar stimulates the release of this

(5)

1.5 1.5.1

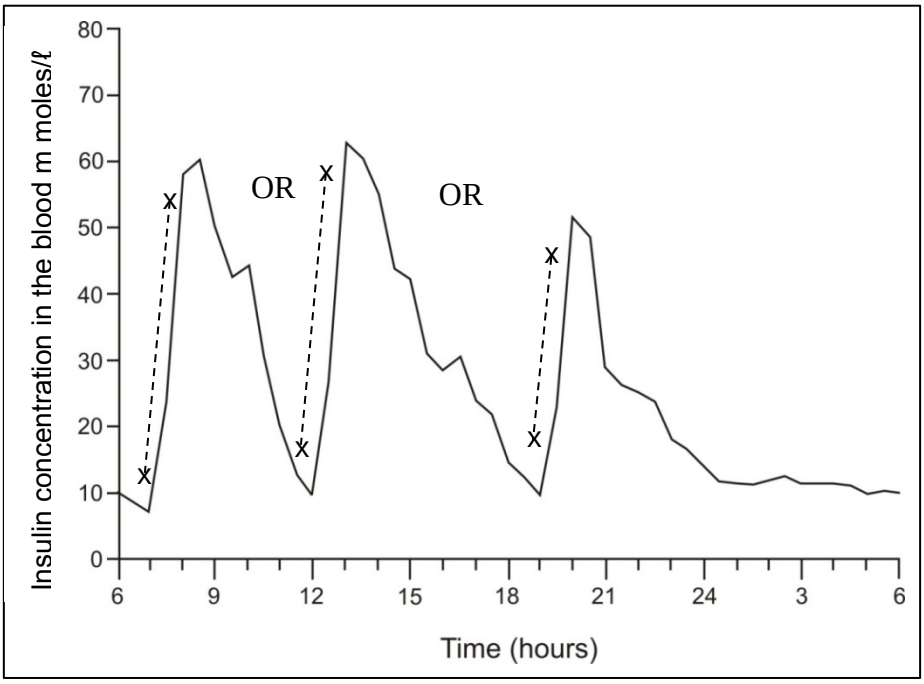


(i) *Diagram showing endocrine system/organs*

Complete the diagram above by adding the following:

(i) A title (1)
(ii) The adrenal glands (1)
(iii) Labels for A and B (2)

1.5.2 The graph below shows: Normal insulin production in a human over a 24 hour period.



(a) What is the normal level for insulin in a healthy person at night? *10 mmoles/ℓ* (2)

(b) Mark the graph clearly with an **X** to show when the person has consumed a meal *(anywhere along the dotted line between x and x).* (1)

(c) Suggest a possible reason why the insulin level after a meal at 20h00 was lower than after other meals.

The meal contained less carbohydrate therefore less glucose or

The person was very active soon after eating so glucose used up (2)

(d) What advice would you give an overweight friend who has just been diagnosed with diabetes?

Lose weight; eat a diet of low GI food/Take insulin injections

as prescribed by doctor/Avoid sugar/refined foods/exercise (2)

[40]

QUESTION 2

2.1 2.1.1 Population size is the number of organisms in a population. (1)

2.1.2 (a) decrease (1)

(b) the birth rate is low the death rate is high OR the immigration rate is lower than the emigration rate; resulting in a nett loss. (3)

2.2.1 trap (1)

2.2.2 must not harm the animal; must not attract predators; OR not affect movement; or behaviour (2)

2.2.3 Total population = $\frac{\text{total no. mice initially marked X total no. in second catch}}{\text{No. of marked mice in the second catch}}$

$= \frac{55 \times 40}{11}$

= 200 mice (4)

2.2.4 open population; so there could have been immigration / emigration; must recapture within a few days
new births – increasing the number; must recapture within a few days
dates for recapture too far apart – more likely that population changes in numbers; must recapture within a few days.
Single sample – calculation can be misleading; do a number of samples to produce an average.
And other reasonable answer (3)

2.2.5 (a) March or April (1)
(b) August or September (1)

2.2.6 Predation is a relationship where the predator kills and eats a prey species. (2)

2.2.7 (a) prey numbers more than predator
lag effect shown
axes labelled
South African predator – prey labelled (4)

(b) If the density of the prey species increases, the density of the predators feeding on it tends to increase, which often causes a decrease in the prey numbers, and a prey number decrease so does the predator density (4)

2.2.8 (a) there is temporal partitioning of resources or other reasonable example (2)
(b) they fly in a swirling flock/aggregate in huge flocks (1)

[30]

QUESTION 3

3.1 3.1.1 Longitudinal Section/L.S. (1)

3.1.2 A filaments – function: support the anther
B stigma – function: place on which pollen germinates/to receive the pollen grains. (4)

3.1.3 (a) ovary (1)
(b) (No) This fruit is poisonous and would make you very ill/cause death (2)

3.1.4 Any reasonable answer with 2 facts involving potatoes as a food source. E.g. Yes – we eat them everyday as they provide a lot of energy/ carbohydrate
Or No – they are too high in carbohydrate and you will get fat if eating a lot (2)

3.1.5

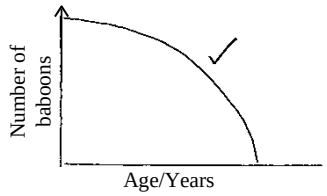
	Potato flower seeds	**Potato tuber 'eyes'**
Type of reproduction	Sexual	Asexual/vegetative
Description of benefits of this type of reproduction	1. variation in genes so less prone to disease 2. variation in phenotype allows individuals to be better adapted to environment changes OR Many more offspring since hundreds of seeds per flower	1. pollination not necessary and can occur at any time 2. happens faster without gamete production OR Produce offspring with the same genotype so same cultivar (variety) is maintained/predictable genotype. If species is well adapted to environment all the offspring will be equally suited

(10)

3.2 3.2.1 (a) False
(b) True
(c) True (3)

3.2.2 In the rainy season animals are more likely to become ill females are more vulnerable to disease when mating/newborn get sick easily in wet weather (2)

3.2.3 Contraceptive pill/injection (1)

3.2.4 

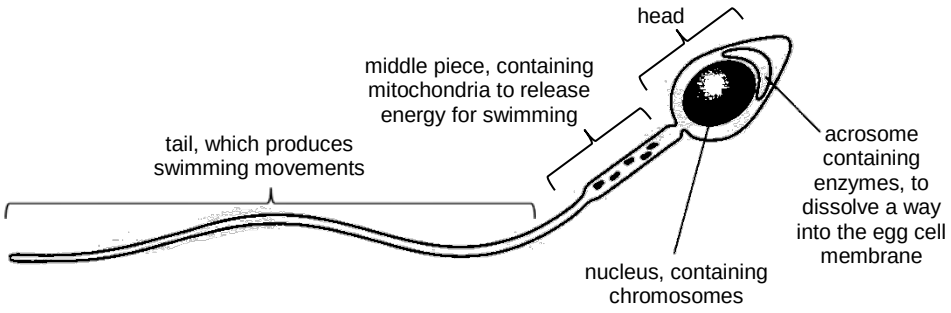
(3)

3.2.5 troop protect young/orphans are adopted/feeding together ensures more safety whilst preoccupied from predators/share search for food (1)

[30]

QUESTION 4

4.1 Show three regions in the drawing
Three correct labels
Two correctly annotated with function



(8)

4.2 For example: rhythm of contractions may force baby into pelvic bones if dilation is not complete/Breech baby that does not turn/umbilical cord around the neck could die during second stage delivery
Any other reasonable answer (3)

4.3 Fertilisation is the fusion of a male (sperm) and female (egg) gamete whereas implantation is the embedding of the embryo in the uterine wall (2)

4.4 4.4.1 (a) contraceptive pill/injection (1)
(b) condom/diaphragm/female condom/tubular ligation/vasectomy (1)
(c) IUD/'morning after pill' (1)

4.4.2 sperm analysis ultra sound/x-rays of woman's reproductive organs (2)

4.4.3 More FSH given (by injection) to produce more oestrogen so more Graafian Follicles mature
Or more testosterone given to male to raise the sperm count (3)

4.4.4 (a) miscarriage is loss of a baby/foetus not carried to term (2)
(b) within first three months of pregnancy (1)
(c) abnormality of the foetus infections/lack of certain hormones/ injury (2)

4.4.5 Surrogate mother has no legal rights over the child – is this moral?
To what extent should the mother be able to control/influence the behaviour of the surrogate during pregnancy? – legal and moral issue
The dilemma if the surrogate does not want to give up the baby; wants visitation rights; interferes in the marriage relationship
Any 4 points (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.

Rubric reference	**I DO think humans have a right ...**	**I DO NOT think humans have a right ...**
Content: thoroughness	Source B – traditional use of horn in medicine and other objects – use of economic stats to support economic growth Source E – rite of passage Source F – aspects of ethical hunting	Source A – poaching of rhino Source B – economic stats used for a greed perspective – no scientific proof of traditional medical claims
Supporting argument	Source D – legalisation of lion hunting Source E – hunters are conservationists	Source C – use answers to myths Source F – killing of big five for ego/manhood
Argument against noted	Source C – myths around lion hunting Source A – poaching to extinction Source F – against trophy hunting	Source D – legalisation change to lion hunting Source E – hunters as conservationists/ rites of passage in culture

[20]

Total: 150 marks

QUESTION 5 Rubric

	1	2	3	4
Content: Thoroughness	• Up to 1/3 of potential detail cited	• About half of potential detail cited	• All main topics covered • About ¾ of potential detail cited • One instance of significant information beyond the sources.	• All main topics covered • Source detail very close to full potential • At least (x) significant instances of information beyond the sources
Content: Relevance	• Mostly digression and/or repetition	• Around half is digression and/or repetition	• Repetition mostly avoided • Some minor digression	• Isolated incidences of minor repetition • No digression.
Supporting Argument i.e. <u>for</u>	• Writing consists of facts with little linkage or reasoning • Reasoning incorrect	• Max if no decision to support • Reasoning correct hard to follow and lengthy • One paragraph placed illogically • Ordinary; some linkage is evident	• Supports the position • Reasoning is clear but bit lengthy • Minor errors in flow • Solid but not compelling; linkage sometimes missed • No new info in conclusion	• Strongly supports a clear position • Reasoning is very clear and succinct • Flow is logical, showing evidence of clear planning (no after-thoughts) • Compelling with regular use of linking language • No new info in conclusion • Refer to at least one incidence of bias, anecdote, false argument, emotive language, etc where relevant
Fairness i.e. Argument against	• Few counter opinions given. • Merit to counter opinion not given	• Counter opinions often given (x) • One instance of merit to counter opinion in order to get a 4.	• Counter opinions regularly given (x) • A few instances (x) of merit to counter opinions.	
Position	• Clear decision made			
Presentation	• Writing is almost unintelligible • Language exceptionally weak • Inappropriate language	• Tone is inconsistent and/or in places inappropriate • Language is weak but appropriate • No terminology • Intro and conc present, no matter how weak	• Tone is consistent and suited to scientific argument • Good and appropriate language • Some good use of terminology • Intro and conc have merit • Some generalization but not exaggerated	• Tone highly mature and suited to scientific argument • Excellent and appropriate language • Good use of terminology • Correct paragraphing with good transitions • Interesting intro, satisfying conc • No sweeping generalisation