NATIONAL SENIOR CERTIFICATE EXAMINATION
SUPPLEMENTARY EXAMINATION MARCH 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.

QUESTION 1

1.1 matching columns
(a) 3
(b) 4
(c) 1
(d) 5

1.2 ovoviviparous eggs laid and fertilised in pouch expelled alive from pouch

1.3 5/1000 × 100/1 = 0,5%

1.4 it enables a shorter cycle of reproduction while the male has the young in his pouch, the female can prepare more eggs soon after the male has given birth to the last litter he is ready to receive more eggs maximizes number of offspring that can survive

1.5 the infant seahorses are so small they cannot eat most of the tiny plankton that are fed to the adults special food has to be grown so the fry do not starve

1.6 TABLE: **Comparison of pregnancy and birth between seahorses and humans**

	Humans	Seahorses
Pregnancy	1. embryo develops in uterus 2. embryo protected by uterine wall and membranes 3. embryo/foetus obtains nutrients through placenta/umbilical cord/ directly from mother's blood	1. embryo develops in egg 2. embryo protected by pouch and egg shell 3. embryo/foetus obtains nutrients from egg/yolk
Birth	1. young born alive 2. takes place through birth canal/ cervix dilates/vaginal birth 3. uterine contractions expel foetus	1. young hatch from eggs 2. expelled from pouch 3. contractions of pouch expel young

× 2 = + column headings + heading =

1.7 Extent of parental care: the father cares for the young as they grow regulating the water salinity in the pouch to prepare them for life in the sea (max 2)
After hatching: offspring have no care or protection after they are born; infant seahorses are susceptible to death from predators/no protection and being swept into ocean currents where they drift away from feeding grounds (max 3)

However, successful by fish standards the eggs are protected in the pouch ensures fairly high survival rate compared to other fish/eggs of other fish are abandoned immediately after fertilisation (max 2)

1.8 Published in National Geographic News/taken from a scientific study/ references given/journal article/scientists involved and quoted

QUESTION 2

2.1 2.1.1 Growth takes place from vegetative structures, e.g. stems, bulbs, corms not from seeds no pollination flowers/reproductive structures not involved

2.1.2 (a) Excess food stored in structures/bulbs/underground stems, etc. until growing season/climate allows new plants to develop overwintering ***(three points)***

(b) store nutrients important food sources

2.1.3 ONE advantage: produce many plants of a desired variety /quickly
ONE disadvantage: if susceptible to disease/changed conditions all plants will be affected/die

2.2 2.2.1 (a) the endometrium tissue grows outside the uterus

(b) shedding of the endometrium (more than) blood and mucus from the vagina

2.2.2 (a) B

(b) thickened layer that receives/cushions a fertilised ovum/egg/ developing embryo for implantation provides nutrients for implanted blastocyst/egg/embryo becomes vascular or glandular

(c) oestrogen released from developing Graafian follicle/ovary causes repair build-up of new endometrium in preparation for pregnancy suppresses release of FSH from pituitary low FSH prevents possibility of further follicles being developed so that only one egg produced at a time ***(five correct facts)***

2.2.3 (a) reproductive ages range from puberty till menopause graph data (20-54) this is when oestrogen levels are at the highest regulates menstrual cycle/build-up of endometrium graph data (10-19) indicate low endometriosis still low levels oestrogen ***(four correct facts)***

(b) 4 – 4,5%

(c) age ranges are very broad/more ages would give more reliable data /more recent data /more reliable /link to oestrogen levels /shows relationship /sample size larger

2.2.4 YES: a lot of dioxin in environment women could easily be exposed to it /rhesus monkeys also primates therefore dioxin could have similar effect on humans
NO: rhesus monkeys are not humans effects in humans not same as in monkeys effects only seen in one population of monkeys sample group not large enough to provide reliable results

QUESTION 3

There are more disadvantages associated with artificial hormones and medicines than there are advantages.

more advantages	*more disadvantages*
A: cancer hormone therapies can cure many serious forms of cancer	A: no abuse
B: human insulin for diabetes less likely to cause allergic reactions.	B:
C: HGH injections are approved for treating: CHILDREN: short build and pituitary dwarfism, as well as poor growth due to a number of medical causes including: Turner's syndrome, etc. Children born small for gestational age ADULTS: Short bowel syndrome, HGH deficiency due to rare pituitary tumours; Muscle-wasting disease associated with HIV/AIDS.	C: HGH abuse – not medically approved; used along with other performance-enhancing drugs to build muscle and improve athletic performance. • Yet HGH's effect on athletic performance is unknown. • Also anti-aging use • Serious side effects: High cholesterol levels increase the risk of diabetes and contribute to the growth of cancerous tumours
D: Thyroxin – severe disorders if hyper- and hypothyroidism Effects many body functions	D:
E: Hormones assist in reducing symptoms of menopause	E:
F:	F: Lance Armstrong, cheating for glory – Erythropoietin, testosterone and cortisone
G: Ritalin – essential to some with ADHD to ensure academic progress	G: Ritalin – abuse for studying, unfair?, etc.
Extra: • debilitating hormonal genetic disorders • HRT – reduces osteoporosis risk	Extra: • Steroid use – side effects • increased cancer risk with HRT

	1 mark	2 marks	3 marks	4 marks	Possible mark (40)
Planning × 2	• Key points present	• Key points developed	• Key points developed • 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 ⅓ of potential detail in sources used	• Up to ½ of potential detail in sources used	• Up to ¾ of potential detail in sources used	• Source detail very close to full potential used	8
Use of own knowledge	• Some facts given beyond the source	• Many facts given beyond the source	• Some facts given beyond the source • Facts integrated into the argument	• Many facts given beyond the source • Facts integrated into the argument	4
Content relevance	• Repetition mostly avoided • Some minor digression • Argument relevant	• Repetition mostly avoided • Some minor digression • 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
Fairness-counter opinions to decision	• One to two counter opinion given	• Three to four counter opinions given	• Integration of one to two counter opinions into argument	• Integration of three to four counter opinions 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

Total: 100 marks