



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2010

LIFE SCIENCES: PAPER I

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

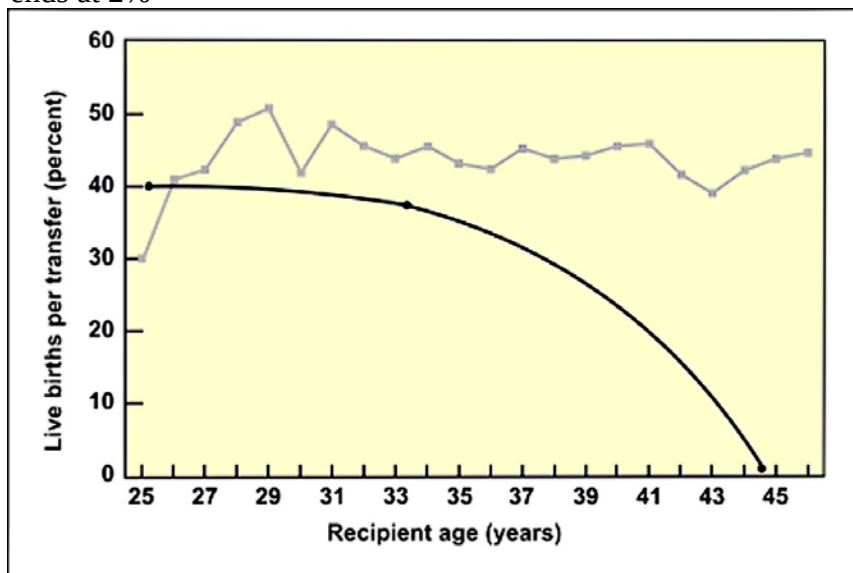
1.1 F H G B A E (6)

1.2 1.2.1 D 1.2.2 A 1.2.3 C 1.2.4 A (6)

1.3 1.3.1 diploid
 1.3.2 gametes/sex cells
 1.3.3 half
 1.3.4 fertilisation
 1.3.5 zygote
 1.3.6 mutations
 1.3.7 karyotype
 1.3.8 nucleotides (8)

1.4 1.4.1 structure/molecular arrangement/shape (1)
 1.4.2 nucleotide/monomer (1)
 1.4.3 label correct (1)
 1.4.4 complementarity shown correctly on opposite chains (2)

1.5 1.5.1 30 yrs (1)
 1.5.2 starts at (25; 40)
 drop to (33; 37)
 convex
 steeper and steeper
 ends at 2% (5)



[After <<http://www.tubal-reversal.net>>]

1.5.3 donor (1)
 1.6 1.6.1 replication (1)
 1.6.2 complete at correct point on correct chromosomes (3)
 1.7 1.7.1 1 = cervix
 2 = fallopian tube/oviduct (2)
 1.7.2 in uterine cavity
 not embedded in wall (2)

[40]

QUESTION 2

- | | | | |
|-----|-------|--|-----|
| 2.1 | 2.1.1 | phosphate (group), deoxyribose/sugar and any base | (1) |
| | 2.1.2 | (a) No | |
| | | (b) Yes | |
| | | (c) Yes | |
| | | (d) Yes | (4) |
| | 2.1.3 | All the molecules are of the same type or other reasonable answer | (2) |
| | 2.1.4 | D and P alternate | |
| | | D and P in the side chains | |
| | | N joins to D (any 2) | (2) |
| | 2.1.5 | uracil | |
| | | ribose | (2) |
| 2.2 | 2.2.1 | homozygous | |
| | | Dominant | (2) |
| | 2.2.2 | same | |
| | | both caused by X and Y | |
| | | X bigger than Y (any 2) | (2) |
| | 2.2.3 | caused by two alleles | |
| | | ● is dominant gene/○ recessive | |
| | | sex-linked trait OR white eyes more common in males | |
| | | ● is gene for red eyes; ○ for white | (4) |
| | 2.2.4 | Y chromosome smaller than X OR some genes on X have no match on Y | (1) |
| | 2.2.5 | discontinuous characteristic OR two distinct phenotypes/no blending OR only two alleles involved | (1) |
| 2.3 | 2.3.1 | food for lots of people | (1) |
| | 2.3.2 | increase virus resistance, nutrition value, and shelf life | (3) |
| | 2.3.3 | phenotypic/phenotypes | (1) |
| | 2.3.4 | tissue culture speeds up plant propagation | |
| | | Cloning/asexual reproduction genetically identical | |
| | | monoculture: mass planting reduces out-breeding | |
| | | GM : produces plants with new desirable genes | |
| | | (any 2 'tools' and explanation) | (4) |

[30]

QUESTION 3

- 3.1 3.1.1 when it is genetically identical to another/a line of genetically identical individuals (2)
- 3.1.2 46 (1)
- 3.1.3 2 only (2)
- 3.1.4 fallopian tube (1)
- 3.1.5 (a) interfering with natural processes/playing God (1)
- (b) new human life is being experimented upon (1)
- 3.2 3.2.1 fingerprints are unique. our DNA is also unique (2)
- 3.2.2 make DNA fingerprints from lost children and parents who report kids missing. Find those that match (3)
- 3.2.3 identify criminals, prevent trafficking by showing kids and guardians NOT related identify dead (any 2) (2)
- 3.2.4 coding DNA can't be random as must perform a function/code for a protein (1)
- 3.2.5 can't use it to identify actual features of people (as these results from coding parts) other answers possible, e.g. proteins – coded for produce our features (1)
- 3.2.6 Bacteria have plasmids AND
That readily incorporates foreign DNA
Maybe primitive human DNA did the same
When invaded by viruses (3)
- 3.3 3.3.1 1 = stigma
3 = ovary (2)
- 3.3.2 2 (1)
- 3.3.3 pollination (1)
- 3.3.4

Property related to flower ovary	Property related to human ovary
May contain a number of large air filled chambers	(a) many small fluid filled
Eggs are kept in structures called ovules	(b) follicles
(c) ovules OR stay in the ovary	Eggs leave the ovary in ovulation
Many ovules normally ripen at once	(d) one egg ripens at a time
Normally one ovary per flower	(e) two ovaries per female
An egg is fertilised by two male gametes	(f) egg fertilised by one male gamete

(6)
[30]

QUESTION 4

4.1 4.1.1

ureter	urine
vas deferens /sperm duct	semen

If non-matching deduct 1 (4)

4.1.2 T/s or x/s or c/s (1)

4.1.3 bigger on same scale (1)

4.1.4 central artery bigger dorsal vein smaller spongy tissue bigger urethra
smaller (any 3) (3)

4.1.5 3 (1)

4.2 4.2.1 androgen/testosterone (1)

4.2.2 13 or 365/28 (1)

4.2.3 establish cause of PCOS wording (2)

4.2.4 identical twins have much higher similarity in all symptoms (maximum 2) (2)

4.2.5 PCOS has high genetic factor: identical twins genetically identical higher
incidence when genetically similar reliable as large numbers of twins
(Must match aim). (4)4.2.6 In a journal which is peer reviewed
Seems to be start of a scientific investigation
Title language sounds advanced
Authors affiliated to universities
Contact details provided (any 2) (2)

4.3 4.3.1 placenta (1)

4.3.2 (a) T (e) F
(b) T (f) F
(c) F (g) T
(d) F (7)**[30]**

QUESTION 5

Sce	Is justifiable	Not justifiable
A	1. Long history 2. Bred for purpose (today as company) 3. Inbreeding is very common 4. MANY benefit 5. Humans also have many disorders 6. SOME breeders – anecdotal . How many? 7. Outspoken people always take flak 8. Last statement just a statement	1. Traditions not always right 2. Mostly no purpose (in urban situation) 3. Standards arbitrary 4. High inbreeding unnatural 5. Small genetic pool 6. Benefit does not mean right 7. Disorders are common 8. Breeders kill pups 9. Victimisation 10. Last statement true
B	1. Defects dubious – 350 in previous text 2. Seems unscientific article 3. Layout and wording highly emotive 4. Defective genes are natural	1. 30 000 defects 2. Simple to get point across 3. Defects are harsh 4. Defective genes would not combine
C	1. Not all in this way – anecdotal	1. Unnatural: daughters mate with fathers, etc.
D	1. How do we know that dog's dream of this? – Emotive	1. Dogs have right to be normal
E	1. More ethical 2. High genetic similarity to humans (E) 3. Good subjects due to inbreeding 4. Helped cure some fatal illnesses (E) 5. New genetic advances (unlike flies) (E)	1. If not dogs some alternative would have cropped up 2. Can't justify benefit to one species at expense of another 3. Cheaper does not mean right 4. Illnesses good – weeds weakest 5. Do we need these advances?
F	1. Emotive and subjective and secondary source	1. Quite correct ... and prob many stories like it!
G	1. Quality = money – many benefit 2. VERY well cared for – dewormed, etc. 3. Import quality = cross breeding	1. Money making machine – Expensive pups by comparison (10x price E), vets bills E , microchipping E 2. Care is a choice 3. Imports = anxiety for dogs

E = extra information

[20]

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 information 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 information 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. - Introduce and conclude present, no matter how weak.	- Tone is consistent and suited to scientific argument. - Good and appropriate language. - Some good use of terminology. - Introduce and conclude have merit. - Some generalisation 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 introduce, satisfying conclude. - No sweeping generalisation.

[20]**Total: 150 marks**