NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2020

LIFE SCIENCES: PAPER II

MARKING GUIDELINES

Time: 2 hours 100 marks

These marking guidelines are prepared for use by examiners and su 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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SECTION A

QUESTION 1

1.1 1.1.1
- Any method to decrease ✓ the chance of fertilisation ✓
- To stop ✓ pregnancy ✓
- To prevent ✓ovum and sperm meeting ✓ (2)

1.1.2
- Fluid ✓ in which sperm is transported ✓
- Mixture of secretions from glands ✓ and sperm cells ✓
- Fluid✓ containing nutrients for sperm survival ✓ (2)

1.2 1.2.1
- Sex occurs at times when the women is least fertile ✓
- Just before or after menstruation ✓
- Sex must therefore be avoided around time of ovulation✓ (any 2)

OR (discuss temperature)
- Temperature peaks at ovulation✓
- Use higher temperatures to avoid intercourse✓
- The period the woman is fertile is known ✓ and intercourse during that period is avoided ✓ (2)

1.2.2 Progesterone ✓ (1)

1.2.3
- Woman could be sick / have a fever / stressed and cycle could be affected/irregular ✓
- Sperm can stay alive in the uterus and fallopian tubes for up to 72 hours ✓
- It may be difficult to determine when temperature rises as the change is quite small ✓
- Must be very disciplined to monitor temp and/or avoid intercourse in unsafe days ✓ (any TWO) (2)

1.2.4
- It's a visual aid ✓ to focus attention on stage of menstrual cycle/ unsafe days ✓
- A reminder ✓ in case they forget when they last menstruated ✓
- Makes woman more aware ✓ of where they are in the cycle ✓ (2)

1.2.5 A 2 ✓
B 4 ✓
C 1 ✓
D 3 ✓ (4)

1.3 1.3.1 B ✓
1.3.2 A ✓
1.3.3 C ✓
1.3.4 A ✓ (4)

1.4
- Progesterone (hormone X) levels remain high ✓ (1 mark)
- Progesterone (hormone X) required for continuous growth of endometrium ✓
- This is required for attachment of embryo / foetus / development of placenta / exchange of nutrients and waste ✓ (3)

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1.5 1.5.1
- Mirena releases progesterone, ✓
- which inhibits LH release ✓
- therefore no ovulation can occur. ✓
- Progesterone also keeps FSH release low, ✓
- therefore no ovum develops. ✓ ANY 3 (3)

1.5.2 52 mg / 0,02 mg ✓ = 2 600 ✓days (2)

1.6 Yes:
- Women can decide when / if they want to have children ✓
- They are not at the mercy of their husbands / boyfriends ✓ / to supply contraception ✓
- They can have a career ✓
- Pill / female condom allows them to control their own contraception ✓

No:
- Responsibility still lies with women, ✓
- hasn't changed culture of male dominance/patriarchal society; ✓
- women are expected to be responsible for contraception ✓ (3)

[30]

QUESTION 2

2.1 2.1.1 Seed ✓

2.1.2 Hormone/auxins ✓

2.1.3 Pollen ✓ (3)

2.2
- Heirloom varieties developed from small groups of plants breeding with one another, ✓
- therefore many characteristics lost ✓ in breeding these parents
- whereas wild plants can be pollinated from any individuals in the area. ✓
- Wild plants breed naturally / randomly, therefore increasing genetic diversity ✓ (3)

2.3 2.3.1
- Sperm from pollen tube ✓
- Fuses with ovum (in ovule) ✓ (2)

2.3.2
- It prevents further / unknown pollen from other plants in the area from landing on stigma / pollinating flower ✓ OR
- Controls crossing of desired features / characteristics ✓ (1)

2.4 2.4.1 Fruit –
- It contains seeds, ✓
- which means that it grew from an ovary ✓
- Seeds develop from the ovules ✓ (ANY 2) (2)

2.4.2 B ✓✓ (2)

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2.5
- Important for storing seeds / to re-establish crop plants ✓
- in case of a natural disaster ✓
- to store seeds from wild plants ✓
- to re-introduce genetic variation ✓ into cultivated plants ✓ (ANY 2) (2)

2.6 2.6.1 (a) Male reproductive parts of the flower ✓ / contains anthers to make pollen ✓ (1)

(b) Attracts pollinators to flower ✓ / protects floral parts in bud ✓ (1)

2.6.2
- The stamens wrap around the stigma/form a tube around stigma ✓
- making it easy for pollen to reach/fall on the stigma which is below anthers ✓
- Pollen from other flowers ✓ cannot reach the stigma easily ✓ (ANY 1 explained reason) (2)

2.7 2.7.1 GH/growth hormone ✓ (1)

2.7.2 Increased growth of bones in face / feet ✓ (1)

2.8 2.8.1 They produce larger fruit / more flavour / seedless therefore more flesh/more nutritious ✓ (1)

2.8.2
- Asexual reproduction involves causing plant somatic cells to produce new plant organs / new plants ✓
- Auxins cause cells to undergo mitosis ✓
- Auxins differentiate to produce root, stem and leaf cells / new plants ✓ (3)

2.9 Comparison between modern hybrid tomatoes and heirloom varieties ✓

	Hybrid	Heirloom ✓(column headings)
Pest / disease resistance	More resistant to pests/ diseases – they are bred for resistance	Less resistance to pests / diseases / resistant to pests / diseases only in area where bred ✓
Consistency of fruit	More uniform – all genetically identical	Less uniform/greater variety of shapes, etc. – more variation present as farmer does not choose to carry out their own pollination ✓
Cost of growing crop	Expensive – have to buy seed every year	Cheaper – can regrow from collected seed ✓

(5)
[30]

60 marks

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SECTION B

QUESTION 3

Women should be allowed to demand an elective Caesarean Section for the birth of their child	
Elective C-section CAN be demanded	**Elective C-section should NOT be demanded**
SOURCE A Respects the woman's right to free choice ✓	**SOURCE A** C-sections only for medical reasons ✓
SOURCE B Women require control over timing of birth ✓ To enable women to have children who have had a previous complicated vaginal delivery ✓ To combat fear of natural birth for first time mothers ✓ Prevents fear of having emergency C-section if natural birth goes wrong ✓ Societal pressure / fashionable to have C-section ✓ Women require a calm setting with less anxiety ✓	**SOURCE B** Elective C-sections fashionable ✓ not necessarily medical indications Only a perception that C-sections are harmless ✓
SOURCE C Many studies on C-section dangers relate to emergency C-sections ✓ Some medical aids cover elective C-sections, therefore legitimate ✓	**SOURCE C** Elective C-sections are not good options as: C-section hospital stay longer than vaginal birth ✓ Women have post-op pain and discomfort with C-sections ✓ Possible bowel, bladder injury, blood clots ✓ Scarring ✓ Placental / uterine problems ✓ Ectopic pregnancies ✓ Evidence for higher possibility of obesity in adulthood in C-section children ✓ Risk of cutting baby with C-sections ✓ Require C-sections in repeat deliveries ✓ Babies risk having breathing problems / immune problems / hormonal problems at and after birth ✓ Greater risk of stillbirths ✓ Surgery risks – risk of death ✓ C-sections could result in feelings of guilt, and failure ✓ Less bonding between mother and child ✓ Some medical aids don't cover elective C-sections ✓
SOURCE D 70% of doctors willing to offer elective C-sections ✓ (*can refute by saying doctors get paid more to do them*) Higher % foetal death in women giving birth naturally compared to elective C-sections ✓ Large sample size in experiments ✓ Risk of maternal deaths via elective C-section less than with natural birth ✓	**SOURCE D** Difference between percentage of foetal deaths via natural compared to elective C-section very small ✓ Risk of maternal deaths via elective C-section very similar to natural birth ✓
SOURCE E	**SOURCE E** Vaginal birth is natural – evolution resulted in a vagina for birth ✓ Bacteria from vagina boosts immune system ✓ Natural birth results in protein release controlling brain development, memory, spatial awareness, learning ✓ No surgery – therefore she can hold her baby and breastfeed sooner ✓

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SOURCE F Doctors should perform C-section if confident a woman is making an informed decision ✓ Women have right to decide about medical procedures ✓ Fear of childbirth can also be rational ✓ Wrong to treat pregnant women as unable to make decision ✓ Significant harm is caused to individuals when doctors ignore their requests ✓ Denying women choice treats women as a means to "deliver a new human being" rather than an individual ✓	**SOURCE F** C-sections should not be routinely offered ✓ Can be against principle of do no harm ✓
SOURCE G Sphincter effects commonly occur in natural birth ✓ Unexplained stillbirth ✓ Chorioamnionitis, cord prolapse, heart problems ✓ and haemorrhage ✓ Foetal death could occur in late pregnancy ✓ Natural birth – lung clogging with meconium / amniotic fluid ✓ Shoulder dystocia, brain bleeding, arm fractures, suffocation ✓	**SOURCE G** C sections should only be conducted when mother or baby is in danger✓ Few women surveyed in sphincter study ✓
SOURCE H Difference in acquiring gut bacteria not known to cause any difference in immunity ✓ Types of bacteria equalise after a while ✓ Expert – should not deter women from having C-section ✓	**SOURCE H** Lack of exposure to right bacteria – autoimmune diseases (e.g. asthma, allergies, diabetes) ✓ (NB – this fact appears already) Babies born vaginally have mother's gut bacteria / C-sections from hospital don't ✓ Expert – not known what effects of different gut bacteria are on foetus ✓
SOURCE I Many women enjoyed experience ✓ Not credible – anecdotal	**SOURCE I** Women gave good thought to whether they wanted a C-section ✓ Not credible – anecdotal
OWN INFO *Less painful* than natural birth (inferred from sources) No damage to pelvic floor / vagina *means less chance of vaginal reconstruction required* (inferred from sources) Prevent transmission of HIV to child from HIV positive mother Less trauma to facial features during C-section	**OWN INFO** Oxytocin release during labour NB for contractions to "heal" uterus Passage through vagina "massages" baby – helps clear lungs Not as invasive – *no surgery required* (inferred from sources) Can drive soon after natural birth

Watch out for essays that use info to debate pros and cons of C-section vs natural birth

40 marks

Total: 100 marks

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Note: Essay should be 2½ to 3 pages long.
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

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

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