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.

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
- To prevent production of ova

1.1.2
- Fluid in which sperm is transported
- Mixture of secretions from glands and sperm cells
- Fluid containing nutrients containing for sperm (must have something referring to 'fluid' with 'sperm' in it

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
- Avoid sex when LH levels are high (or allow when LH levels are low (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

1.2.2 Progesterone

1.2.3
- Woman could be sick / have a fever / stressed / cycle could be 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 / temperature readings may be inaccurate
- Must be very disciplined to monitor temp and/or avoid intercourse in unsafe days
- It requires special equipment which is expensive / not freely available / special skills needed
- No physical barrier is present to prevent sperm meeting ovum (any TWO) NB – STATE 2 – no explanations needed; mark FIRST 2 points

1.2.4
- It's a visual aid to focus attention / keep track 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 NB EXPLAIN 1 way

1.2.5 A 2
B 4
C 1
D 3 (can leave out letters and just write 2, 4, 1, 3)

1.3 1.3.1 B
1.3.2 A
1.3.3 C
1.3.4 A

1.4
- Progesterone (hormone X) levels remain high (or increase) (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 / to ensure FHS / LH remain low so that no further ovum / follicle can mature
  OR can interpret as what CAUSES progesterone to stay high:
- Corpus luteum stays intact as hormone made (HCG from chorionic villi) that stop it dying
  (1 for what progesterone will do; 2 for explanation)

1.5 1.5.1
- Mirena releases progesterone,
- which inhibits LH release
- therefore no ovum released

OR

- MIrena released progesterone
- Progesterone keeps FSH release low,
- therefore no ovum develops. ANY 3

1.5.2 52 mg / 0,02 mg = 2 600 days

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
- Women are not just objects to produce children
- They can have a career (or any other factors regarding controlling menstrual cycle to avoid missing school / be able to participate in sports
- Pill / female condom allows them to control their own contraception
- Many methods of contraception are available for women now

No:
- Responsibility still lies with women as most contraception available is only for women
- Responsibility lies with women as contraceptives available for women are difficult to get / expensive / not as easily available /chemicals from contraceptives are dangerous compared to male contraception
- hasn't changed culture of male dominance/patriarchal society;
- women are expected to be responsible for contraception
- many other factors are responsible for change in equal rights not just contraception

QUESTION 2

2.1 2.1.1 Seed

2.1.2 Hormone/auxins

2.1.3 Pollen

2.2
- Heirloom varieties developed from small groups of plants breeding with one another,
- therefore many characteristics lost / increase in homozygosity / in breeding these parents
- whereas wild plants can be pollinated from any individuals in the area. Must talk about BOTH heirloom and wild relatives – eg 2 marks for heirloom and 1 mark for wild or vice versa
- Wild plants breed naturally / randomly, therefore increasing genetic diversity

2.3 2.3.1
- Sperm (from pollen tube (SPERM fuses with OVUM
- Fuses with ovum to form a zygote(must have the concept of fusion for the 'zygote' mark)

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

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

2.4.2 B

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

2.6 2.6.1 (a) Contains anthers to (make pollen) / hold up anthers to allow pollen release

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

2.6.2
- The stamens wrap around the stigma/form a tube around stigma / stigma is shorter than stamens / stamens are close to 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)

2.7 2.7.1 GH/growth hormone / somatotropin/ STH / HGH

2.7.2 Increased growth / size of (bones in) face / feet / larger vertebrae / enlargement of tongue / soft tissues (ie ANY other symptom of acromegaly

2.8 2.8.1 They produce larger fruit / more flavour / seedless therefore more flesh/more nutritious

2.8.2
- Asexual reproduction involves causing plant somatic cells to produce new plant organs / new plants / growth of plant
- Auxins cause cells to undergo mitosis
- Auxins cause differentiation to produce root, stem and leaf cells / new plants

2.9 Comparison between modern hybrid tomatoes and heirloom varieties

	Hybrid	Heirloom (column headings)
Pest / disease resistance	Higher resistance to pests/ diseases – they are bred for resistance	Less resistance to pests / diseases / unknown (as the plants are more variable) resistant to pests / diseases only in area where bred
Consistency of fruit size	More uniform / consistent – all genetically identical	Less uniform/greater variety of shapes / less consistent, 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

NB – description can be in the row descriptor or under the types of plants

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 Narrow pelvis Small opening Difficult birth	**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 Only a small risk of cutting baby	**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 Cap list of points from this source to 2 marks, unless each is discussed separately in the essay
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** 70% of doctors willing to offer elective C sections (as they get paid more to do them) – S 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 Small sample size to justify foetal deaths being higher with vaginal births – affects validity
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
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 Natural childbirth is painful	**SOURCE F** C-sections should not be routinely offered Can be against principle of do no harm
SOURCE G Sphincter defects commonly occur in natural birth Unexplained stillbirth / Chorion infection, cord prolapse, heart problems Haemorrhage/ Foetal death could occur in late pregnancy / stress causing lung clogging with meconium / amniotic fluid Shoulder dystocia / brain bleeding / arm fractures / suffocation (ie one mark per row in source)	**SOURCE G** C sections should only be conducted when mother or baby is in danger
SOURCE H Difference in acquiring gut bacteria not known to cause any difference in immunity Types of bacteria equalise after a while Expert – bacteria community 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
SOURCE I Women gave good thought to whether they wanted a C-section Fashionable Not credible – anecdotal	**SOURCE I** Many women enjoyed experience Not credible – anecdotal Fashionable
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 Risk of episiotomy with natural Easier to keep figure with modern methods of C sections	**OWN INFO** Oxytocin release during labour NB for contractions to "heal" uterus Breastfeeding is easier Passage through vagina "massages" baby – helps clear lungs Not as invasive – *no surgery required* (inferred from sources) Can drive soon after natural birth Less chance of infections Easier to keep figure if natural childbirth occurs Anaesthetics needed

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

Total: 100 marks

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

	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