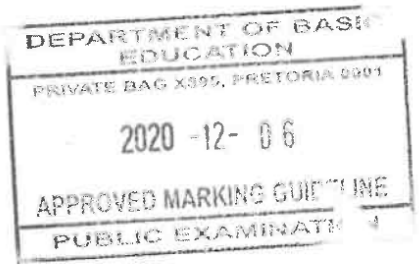
QUESTION BANK: HUMAN REPRODUCTION

2020

1.1.5 B

1.2.5 Luteinising /LH

1.2.7 Umbilical artery



1.4.1	Acrosome✓		(1)
1.4.2	Mitochondria✓		(1)
1.4.3	(a) 3✓		(1)
	(b) 1✓		(1)
	(c) 1✓		(1)
1.4.4	B✓- Nucleus✓		(2)
1.4.5	Mitosis✓		(1)
3.2.1	Cervix✓		(1)
3.2.2	- The site of fertilisation ✓ - The site of zygote division✓ - The transfer of the ovum/embryo to the uterus✓ **(Mark first ONE only)**	Any	(1)
3.2.3	- Diploid cells in the ovary undergo mitosis✓ - to form numerous follicles✓ - Under the influence of FSH✓ - one cell undergoes meiosis✓ - to form a (haploid) ovum✓	Any	(4)
3.2.4	- It is a hollow organ✓ - It has a muscular wall✓ - It has a blood-rich lining✓/endometrium **(Mark first ONE only)**	Any	(1)
3.2.5	- No follicle will develop✓ - No oestrogen produced✓ - and no progesterone produced✓ - Therefore, the endometrium will not develop✓* to be shed during menstruation	**Compulsory mark✓*1** + Any 2	(3)

3.3.1 Male fertility✓ (1)

3.3.2 Measuring the sperm count✓ (1)

3.3.3
- Age✓
- Diet✓
- Exercise✓
- Activity level✓
- Lifestyle✓
- Occupation✓ etc

(Accept factors that are NOT related to health; race) Any (2)
(Mark first TWO only)

3.3.4
- TU inhibits the secretion of testosterone✓
- spermatogenesis cannot take place✓/no sperm will be produced (2)

3.3.5
- The higher temperature/pressure on the testes✓ due to the tight underwear
- could decrease the sperm count✓/sperm production/lead to the production of abnormal sperm (2)

3.3.6
- To determine if TU is still effective after 12 months✓
- To see if the sperm count returns to normal✓ when the treatment stops Any (1)

(Mark first ONE only)

3.3.7
- No sperm will be transported✓
- from the epididymis to the urethra✓
- Semen without sperm will be released✓ Any (2)

(11)

2019

1.1.5 B

1.1.6 C

1.1.8 B

1.2.1 Chorionic villi✓
1.2.2 Cytokinesis✓
1.2.3 Invasive alien✓/Invasive exotic
1.2.4 Vagina✓
1.2.5 Deforestation✓
1.2.6 Prolactin✓
1.2.7 Gestation✓
1.2.8 Fallopian tubes✓/Oviducts
1.2.9 Puberty✓

1.3.1 A only

1.4.1 (a) Jelly layer✓/Zona pellucida (1)
(b) Cytoplasm✓/cytosol (1)
(c) Acrosome✓ (1)

1.4.2 Oogenesis✓ (1)

1.4.3 D✓ (1)

1.4.4 E✓
F✓ (2)
(Mark first TWO only) **(7)**

2.4.1
- The high levels of progesterone✓in the pills
- will inhibit the secretion of FSH✓from the pituitary gland
- No follicle will develop✓
- and hence no oestrogen will be secreted✓ (4)

2.4.2
- The increase in the progesterone level✓
- indicates that corpus luteum has been formed✓ (2)

2.4.3
- Women will stay in the habit of taking a pill every day✓/will not forget to take the progesterone containing pills

- To allow menstruation to occur✓ Any (1)

(Mark first ONE only) **(7)**

2.5
- Zygote divides by mitosis✓
- to form a ball of cells✓
- called the morula✓
- which further divides to form a hollow ball of cells✓
- called the blastula✓/blastocyst Any **(4)**

2018

1.1.1 B 1.1.5 C

1.4.1 Fertilisation✓ (1)

1.4.2 Mitosis✓ (1)

1.4.3
- Chorion✓
- Amnion✓

(Mark first TWO only) (2)

1.4.4
(a) Zygote✓ (1)
(b) Morula✓ (1)
(c) Blastocyst✓/blastula (1)

1.4.5 Fallopian tube✓ (1)

1.4.6 47✓ (1)
(9)

2.2.1
- Needed for spermatogenesis✓
- Stimulates the development of secondary male characteristics✓/deeper voice/facial hair/body hair/increased muscle mass/increase in size of the sex organs/sex drive

(Mark first ONE only) Any (1)

2.2.2
- Administering testosterone✓/hormonal treatment
- Surgery✓

(2)
(Mark first TWO only)

2.2.3 33⅓✓ % (1)

2.2.4 It increases the risk of testicular cancer✓ (1)
(Mark first ONE only)

2.2.5
- The temperature of the testes will be too high✓/poor blood circulation/increased pressure on the testes
- therefore sperm will not mature✓/spermatogenesis will be negatively affected

(2)
(7)

2.3.1 To calculate BMI✓ (1)

2.3.2 41/100✓ x 1510✓ = 619✓ (Accept 619,1) (3)

2.3.3 Only women with planned pregnancies will know how long it took them to fall pregnant✓✓ (2)

2.3.4 All the women:
- were the same age✓/between the ages of 20 and 30 years
- were pregnant for the same amount of time✓/at least 20 weeks pregnant
- had planned to fall pregnant✓
- had conceived naturally✓

(Mark first ONE only) (1)

2.3.5 Any (2)

Do not smoke if your BMI is <20 or ≥30✓✓

2.3.6
- Similar/same results were obtained✓ (2)
- in the second/repeated investigation✓ **(11)**

2017

1.1.10 D

1.2.6 LH

2.4.1 (a) Chorion✓/Amnion (1)

(b) Umbilical cord✓ (1)

2.4.2
- Protects the foetus from shock✓/Acts as a shock absorber
- Protects the foetus from drying out✓
- Protects the foetus from temperature changes✓
- Allows free movement of the foetus✓ (Any 2) (2)

(MARK FIRST TWO ONLY)

2.4.3
- Gaseous exchange system✓
- Excretory system✓
- Digestive system✓ (Any 1) (1)

(MARK FIRST ONE ONLY)

2.4.4
- The foetus will receive less nutrients✓ and therefore have a lower birth mass✓/physical under-development/mental under-development

- The foetus will receive less oxygen✓ and therefore have a lower birth mass✓/physical under-development/mental under-development

- Waste will accumulate✓ and it will affect the functioning of the foetus✓ (A (2)

Spermatogenesis✓ (S)
- Takes place under the influence of testosterone✓
- in the seminiferous tubules✓/testis
- Diploid cells✓/germinal epithelium
- undergo meiosis✓
- to form haploid sperm cells✓ (Any 4) (4)

Formation and transport of semen (T)
- Sperm mature✓/are temporarily stored
- in the epididymis✓
- During ejaculation✓
- sperm move into the vas deferens✓
- As it passes the seminal vesicles✓,
- prostate gland✓ and
- Cowper's glands✓
- fluids are added that provide nutrition,✓
- promote the movement✓ of the sperm
- and neutralise the acids ✓ produced in the vagina
- The semen passes through the urethra✓
- of the penis✓
- into the vagina✓
- during copulation✓
- and swims up the Fallopian tube✓where it meets the ovum (Any 7) (7)

Structural suitability of the sperm cell for fertilisation (A)
- The acrosome✓
- contains enzymes to dissolve a path into the ovum✓

- Nucleus of the sperm✓
- carries genetic material of the male✓/haploid number of chromosomes

- Many mitochondria✓in the middle piece
- release energy✓ so that sperms could swim

- The presence of a tail✓
- enables sperm cells to swim✓ towards the ovum

- The contents of the sperm cell such as the cytoplasm is reduced✓/condensed
- making the sperm light for efficient movement✓

- Sperm is streamlined✓
- to allow for easier movement✓
  (MARK FIRST THREE ONLY) (Any 3 x 2) (6)

2016

1.2.7 Endometrium

1.2.8 Fallopian tube

2.1.1 Seminal vesicles✓ (1)

2.1.2 A✓
B✓
D✓ Any (2)
(Mark first TWO only)

2.1.3
- Fertility is reduced✓
- because the temperature is always high✓
- This will lead to production of abnormal sperm✓/fewer sperm are formed/proteins in the cells that form the sperm will denature

OR
- Fertility is reduced✓
- because pressure is increased✓/reducing circulation of blood
- This will lead to production of abnormal sperm✓/fewer sperm are formed (3)

2.2.1 Pituitary✓ gland/hypophysis (1)

2.2.2
- High levels of LH✓
- stimulates ovulation✓ (2)

2.2.3
- To monitor their fertile periods✓
- to prevent pregnancy✓/to increase chances of falling pregnant (2)

2.2.4
- Oestrogen✓
- levels rise✓ (2)

2.2.5 Between 16 and 18✓✓ (2)

2.2.6
- Progesterone only rises✓
- after ovulation✓
- This shows that the fertility period has already passed✓/when fertility is low (3)

2015

1.1.1 A 1.1.6 C

1.2.7 Testosterone/FSH/LH

2.3.1
- Seek permission✓/ethical clearance
- Deciding on the sample size✓
- Deciding on the equipment for measuring✓
- Deciding on the age-group of the participants✓
- Deciding on using women with regular menstrual cycles✓
- Deciding on how to record the results✓
- Decide on the duration✓
- Learning how to use the equipment✓ (Any 2) (2)

(MARK FIRST TWO ONLY)

2.3.2 (a)
- The follicles decreased in size✓
- as ovulation had taken place✓
- The resulting corpus luteum became smaller✓
- because fertilisation did not take place✓ (Any 3) (3)

(b)
- The production of FSH✓
- will be inhibited✓
- which will stop/inhibit the development/growth of a follicle✓
- therefore the follicle size will remain the same✓ (Any 3) (3)

Structural suitability of the sperm cell for internal fertilisation

- The front of the head of the sperm cell contains an acrosome✓/vesicle which carries enzymes to dissolve a path into the ovum✓

- Nucleus of the sperm✓ carries genetic material of the male✓/ haploid number of chromosomes

- The middle piece contains mitochondria✓ which release energy✓ so that sperms could swim

- The presence of a long tail✓ enables sperm cells to swim✓ towards the ovum

- The contents of the sperm cell such as the cytoplasm is reduced✓/condensed making the sperm light for efficient movement✓ (Any 3 x 2) (6)

Fertilisation

- In the Fallopian tubes✓
- one sperm cell makes contact with the ovum's membrane✓
- The nucleus of the sperm enters the ovum✓
- Then the ovum membrane becomes impenetrable✓to other sperms
- The nucleus of the sperm fuses✓
- with the nucleus of the ovum✓ } OR sperm fuses with an ovum✓
- to form a diploid✓ zygote
- This is called fertilisation✓ (Any 5) (5)

Events after fertilisation until implantation

- The zygote divides by mitosis✓many times
- to form an embryo✓
- It first consists of a ball of cells✓
- called the morula✓
- which then develops into a hollow ball of cells✓
- called the blastula✓/blastocyst
- It embeds itself into the uterus lining✓/endometrium
- using chorionic villi✓ (Any 6) (6)

Content: (17)
Synthesis: (3)

IEB QUESTIONS

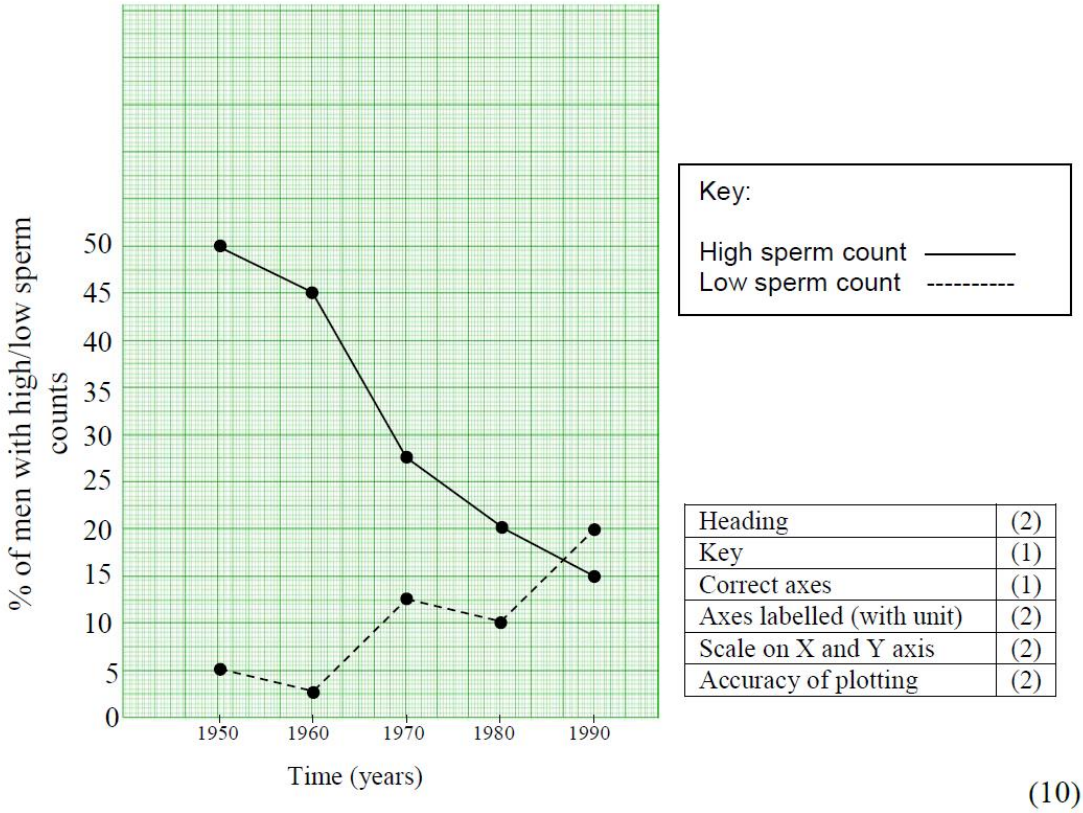
QUESTION BANK: HUMAN REPRODUCTION

ANSWER: C

1.7.1 % men with high sperm count is steadily decreasing while % men with low sperm count is steadily increasing. (2)

1.7.2 Large amount of oestrogen in food / high levels of stress or any other reasonable answer. (2)

1.7.3 Heading: Graph showing the % of men with high and low sperm counts over a period of time.



Heading	(2)
Key	(1)
Correct axes	(1)
Axes labelled (with unit)	(2)
Scale on X and Y axis	(2)
Accuracy of plotting	(2)

(10)

3.1.1 (a) False
(b) False
(c) True
(d) False

3.1.2 Membrane barrier prevents many micro-organisms from entering foetal blood.
Membrane prevents mixing of maternal and foetal blood, which may be different types.
Prevents high pressure of maternal blood from entering delicate foetal vessels.
Secretes progesterone to prevent detachment from endometrium/keep anchored to uterus.
(mark first 2)

3.1.3 Table comparing blood in maternal arteries and blood in the umbilical arteries.

	Maternal Arteries	**Umbilical Arteries**
Amt of Oxygen	High	Low
Amt of CO_2	Low	High
Amt of Nutrients	High	Low
Amt of Metabolic waste	Low	High

Table format complete.
(Design of table may vary but must be comparative points. Only mark first 3. If points aren't matching up, only mark 1 side of table.)

3.1.4 (a) As the placenta detaches from the wall there will not be a fresh blood supply/oxygen supply so baby dies./Mother will lose lots of blood and could die.

(b) Caesarean section involves cutting the abdominal and uterine wall to deliver baby.
Vaginal delivery is non-surgical and involves the mother pushing the baby out through the vagina.

(c) Birth defects/cerebral palsy can result from this condition. Parents might try to sue the doctor even though it is not his/her fault.

3.2.3 FSH is released from pituitary gland, which causes maturation of follicle/ primary follicle to develop into a Graafian follicle. The pituitary then releases luteinizing hormone, which causes the egg to be released from Graafian follicle/ovulation.

3.2.4 (a) Sperm is just the male gamete, whereas semen includes male gametes and fluids released into the sperm ducts along the way.

(b) Fertilisation involves fusion of egg and sperm whereas implantation involves the embryo becoming embedded in the endometrium.

(c) Cervix is neck of uterus/junction of vagina and uterus whereas vagina is the receiving chamber open to exterior/birth canal/where penis enters to deposit sperm.

(d) Conception involves the formation of a new life/fusion of egg and sperm/start of pregnancy whereas contraception is a method used to prevent formation of a new life/fusion of egg and sperm.

4.2.1 FSH

4.2.2 follicle ruptured/Ovulation occurred on day 14 so the follicle no longer contained the ovum (egg)

4.2.3 (a) From days 5–14 (25) the follicle secretes oestrogen
From days 15–25 the follicle secretes progesterone
(First 2 hormones marked)

(b) Oestrogen – causes endometrium to build up/development of secondary sexual characteristics or specific one/stimulates release of LH/inhibit FSH
Progesterone – maintenance of endometrium/vascularisation and glandularisation of endometrium prepares uterus for pregnancy. Inhibits FSH and LH.

4.3.1 They allow for erection of penis, which enables sperm to be placed deep inside female body increasing chances of successful fertilisation.

4.3.2

Component	Importance
Fluid/water	Allow sperm to swim
Sugar/Sucrose/fructose (seminal fluid)	Provide energy for sperm to swim
Alkaline/buffer/mucous (prostate fluid)	Neutralise vaginal acidity/acidity in urethra
Lubricant/mucous (cowpers/ pre-ejaculatory fluid)	Allow penis to penetrate vagina/ viscosity – sperm stick

	Statement	A, B or C
1.3.1	Alcohol is also responsible for low birthweight in newborn babies	C
1.3.2	Smoking during pregnancy increases the chance of low birthweight babies.	A
1.3.3	All low birthweight babies have mothers who smoke.	B
1.3.4	There are more babies born whose birthweight is 2 000–2 499 g than babies whose birthweight is 1 000–1 499 g.	A
1.3.5	Smoking during pregnancy can cause brain damage to the child.	C

1.4.1 1. Tail/contractile fibres/axoneme/flagellum
2. Middle piece/neck/mid piece
3. Head
4. Acrosome
5. Nucleus
6. Mitochondrion (or plural) Mitochondrial spiral or coil

1.4.2 1 and 6/2

1.4.3 To swim to/reach/move to egg quickly / whilst egg/sperm are viable

1.4.4 (a) Water/Saline solution/fructose/no caffeine/mucous/alkaline fluid/fluid from reproductive accessory glands

(b) To compare (implied) with experiment to ensure that it is the caffeine/ independent variable causing the effect.

1.4.5 (a) Caffeine (or no caffeine/amount or concentration)

(b) Sperm motility

(c) Number of sperm/amt of fluid/person donating sperm/time in petri dish/ age or freshness of sperm, pH, etc.

1.4.6 The acrosome needs to burst to dissolve membrane so that nucleus can enter/penetrate/combine with the ovum/fuse with egg

3.1.1 (a) A mature follicle containing an ovum found in the ovary of a female. (1)
(b) Remains of follicle after ovulation, which continues to secrete hormone. (1)

3.1.2 Slow increase in diameter from day 0–16 under the influence of FSH and then sudden, steep increase. (4)

3.1.3 Ovulation (1)
just after Day 20 the diameter decreases sharply indicating that follicle has ruptured. (2)

3.1.4 FSH causes the follicle to mature, growing in size.
LH causes the follicle to rupture, thus decreasing in size. (4)

3.1.5 (a) Oestrogen this causes the endometrium to begin building up/ thicken. (2)
(b) Progesterone this maintains/vascularises/glandularises the endometrium. (2)

3.1.6 Empty follicle started to decrease in size – if pregnant it would maintain size. (2)

	STATEMENT	A, B OR C
1.3.1	Infertility can be due to problems in both women and men.	C
1.3.2	The majority of fertility problems in women are due to endometriosis.	B
1.3.3	The single largest contributing factor to female infertility relates to ovulation.	A
1.3.4	Stress contributes to female infertility.	C
1.3.5	There may be factors affecting female fertility that are not mentioned in the pie chart above.	A

4.1 A – prostate gland B – vas deferens / sperm duct
C – urethra D – scrotum

4.2 4.2.1 Tip of penis

4.2.2 (a) True
(b) True
(c) False

4.3 4.3.1 Testes

4.3.2 Rapid physical growth in puberty; development of secondary sexual characteristics; regulate secretion of LH and FSH; sex drive; sperm production.

4.3.3 High levels of testosterone in blood inhibits secretion of LH and FSH from pituitary gland acts on testes stop secreting testosterone resulting in less sperm production.
(*5 good facts sequentially*)

4.3.4 Unfair advantage reduce pressure from coaches and parents to take steroids reduce peer pressure to take steroids steroids have serious side-effects, e.g. lowers fertility, disrupts secretion of reproductive hormones steroid side-effects more pronounced in adolescents high levels of aggression testing acts as a deterrent highlight the dangers of taking steroids.

1.4

	Statement	A, B or C
1.4.1	South Africa has more cases of FAS than the rest of the world.	A / C
1.4.2	Abnormalities caused by foetal alcohol syndrome are reversible.	B
1.4.3	FAS can be prevented by avoiding alcohol during pregnancy.	A
1.4.4	Children with FAS have physical abnormalities and intellectual disabilities.	A
1.4.5	FAS largely affects poverty stricken areas.	C

1.6.1 Label on diagram.

1.6.2

	Term/Description	Correct letter
(a)	Mature Graafian follicle	C
(b)	Ovulation	D
(c)	Corpus luteum	E
(d)	Releases oestrogen at the start of the menstrual cycle.	B
(e)	Starts developing as a result of FSH release.	A
(f)	Produces a hormone to inhibit FSH production after ovulation.	E
(g)	Remains in place if fertilisation does occur.	E
(h)	Occurs due to a surge in LH.	D

1.7.2 Heading: Differences between sexual and asexual reproduction.

Sexual	**Asexual** (column headings)
Production of gametes	No production of gametes
Results in variation	Clones of parent
Slower process	Faster process
Requires larger input of energy	More energy efficient
Pollination/Pollinators required	No pollination
Requires sexual reproductive structures e.g. flower	Any vegetative part
Usually 2 parents	One parent

Construction of table format
(*Accept other relevant differences*)

3.3.1 Pituitary Gland/Hypophysis (1)

3.3.2 P – Oestrogen Q – Progesterone (2)

3.3.3 (a) Corpus Luteum (1)

(b) Placenta (1)

3.3.4 No – her progesterone levels have decreased; at end of cycle (3)

1.2

Question	1.2.1	1.2.2	1.2.3	1.2.4	1.2.5	1.2.6	1.2.7
Answer	A	C	A	D	C	C	D

(10)

1.4.1 (a) Hours after sexual intercourse (2)

(b) Dependent variable – pregnancy rate (2)

1.4.2 1.5/100 × 200 = 3 (3)

1.4.3

	Statement	A, B or C
(a)	Taking MAP within 12 hours of unprotected sex guarantees no pregnancy.	B
(b)	The longer you wait to take the MAP after unprotected sex, the less effective it becomes.	A
(c)	MAP is not recommended as a method of contraception.	C
(d)	95,9% of women who take the MAP 72 hours after unprotected sex will not fall pregnant.	A
(e)	MAP should only be dispensed if a doctor prescribes it.	C

(5)

1.4.4 Yes – every woman has a right to make decisions about her body

- A young girl is not ready to become a parent regardless of what her parents think
- It will cut down on abortion rate as it won't allow implantation (less traumatic than abortion)

OR

No – girls are too young to make mature decisions about their futures; need parental guidance

- Encourages promiscuity as it is so easy to prevent the pregnancy
- Bad for health so parents must be involved with decision (2 × 2)

2.1.1 uterus / lining of uterus

2.1.2 place where embryo is implanted / nourishes embryo / forms placenta

2.1.3 breaks down and leaves body as menstrual flow

2.1.4 During the course of the menstrual cycle the endometrium thickens.

2.1.5 oestrogen progesterone

2.1.6 Every woman's menstrual cycle may differ in length / illness or stress can affect menstrual cycle therefore ovulation may occur at different times / days data has been calculated from an average (any two)

2.1.7 test normal / natural menstrual cycle / oral contraceptives contain hormones / progesterone / oestrogen that would affect menstrual cycle / endometrium thickness

2.1.8 volunteers used participants give informed consent study should not affect health / dignity participants remain anonymous women tested for pregnancy first Accept other reasonable suggestions e.g. they should not be harmed women must be aware of parameters of the study (max 2)

2.1.9 dealing with human subjects/ living organism right to have privacy respected have right to decide whether to be involved in study sensitive tests so respect dignity Accept other reasonable suggestions (max 2)

2.1.10 endometrium would get thicker / remain thick / would not break down / become more vascular

2.2.1 testosterone

2.2.2 Males also have a (shared) responsibility for contraception not all women can safely use hormonal contraceptives can create a platform for gender equality Accept other reasonable suggestions e.g. it stops sperm / gamete production / effective temporary (reversible) measure / another alternative male contraception (more choice)

2.2.3 safety in use, e.g. safety trials effectiveness as contraceptive side-effects determined Accept other reasonable suggestions, e.g. does sperm production return to normal when stop using does not protect men from STIs

2.2.4 Flow diagram to show negative feedback in sperm production
low testosterone → pituitary gland releases more LH (ICSH) and FSH → more testosterone released → sperm production stimulated
(any 4 points in correct order) arrows in flow diagram heading

2.2.5 condom mechanical barrier, traps sperm, placed over penis during intercourse **OR** vasectomy prevents sperm release by cutting sperm duct / vas deferens **OR** withdrawal remove penis before ejaculation

2.3.1 produce sperm / gametes / spermatogenesis

2.3.2 as age increases the larger the testis volume the greater the length of seminiferous tubules

2.3.3 440 – 460 m Check answer on final printed copy

2.3.4 Yes sudden increase in testis size / seminiferous tubules
No, at age 10–12 testis size/ volume/ seminiferous tubules increases

2.3.5 penis enlarges growth of pubic hair deepening of voice growth in body size hair growth on face / underarms enlargement of skeletal muscles and broadening of shoulders acne (max 2)

1.3.1 cross / transverse

1.3.2 transports nutrients / glucose transports O_2 transports CO_2 transports urea / waste products (any 2)

1.3.3 obtain stem cells for medical use to treat disease later on / treat genetic disorders / store for later medical use Accept other suitable answers, e.g. stem cells are undifferentiated.

1.4.1 A – uterus/ myometrium

B – amniotic fluid/ amniotic cavity

C – cervix

D – vagina

1.4.2 on diagram: extend from placenta to centre of abdominal area of foetus

1.4.3 acts as shock absorber/ protects foetus from mechanical impact maintains foetal temperature allows free/ easy movement of foetus allows symmetrical musculoskeletal development (due to pressure of fluid) foetus practises breathing movements by inhaling liquid practises swallowing of liquid swallowing amniotic fluid helps in formation of gastrointestinal tract prevent dehydration (any 2)

1.4.1 maintains endometrium during pregnancy thickens endometrium in preparation for pregnancy decreases contractibility of uterine smooth muscles during pregnancy development of mammary glands during pregnancy suppresses FSH & LH

1.4.2 8,0–8,2 ng/ml (Check answer after printing)

1.4.3 ovulation/pregnancy/implantation

1.4.4 (a) cow B/B

(b) progesterone levels do not decrease/remain high

1.4.5 larger in B/remain large in B shrink/smaller in A

3.1.1 excretion of oestrogen by women on the pill plastics crop fertilisers livestock given oestrogen

3.1.2 Graafian follicle/ovary (adipose tissue)

3.1.3 prevents ovulation preventing pregnancy /high levels of oestrogen prevents release of FSH

3.1.4 at night

3.1.5 to attract females for mating

3.1.6 (a) The higher the concentration of oestrogen the shorter the call duration of frogs

(b) less likely to attract females reproduction rate would decrease

3.1.7 record sounds count how long/how many females approach males for each call length

3.1.8 Stricter laws to reduce plastic pollution
use less fertilizer to prevent runoff into water bodies
improved water purification system to remove hormones from water
outlaw hormone use in livestock to reduce ingested and excreted hormones
[name and explain] × 2

3.1.9 (a) produce sperm/male gametes produce testosterone

(b) pathway for sperm to leave testes