



Exampro GCSE Biology

B1 Chapter 2 Coordination
Hier tier

Name:

Class:

Author:

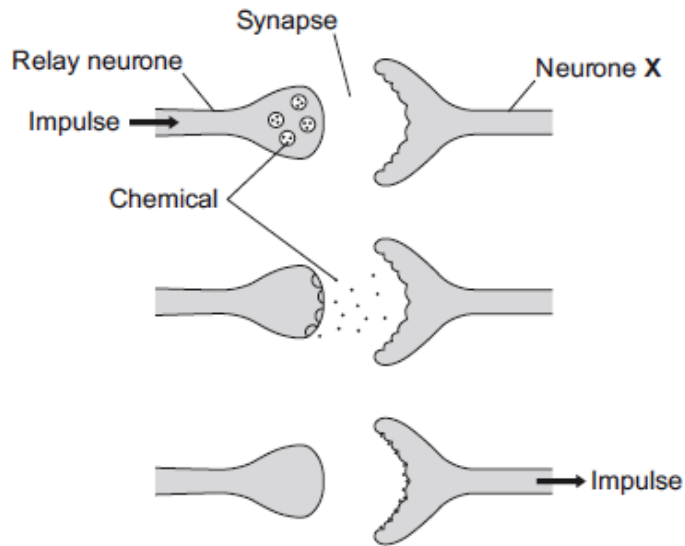
Date:

Time: 65

Marks: 65

Comments:

Q1. The diagram below shows how a nerve impulse passing along a relay neurone causes an impulse to be sent along another type of neurone, neurone X.



(a) What type of neurone is neurone X?

.....

(1)

(b) Describe how information passes from the relay neurone to neurone X. Use the diagram to help you.

.....

(3)

(c) Scientists investigated the effect of two toxins on the way in which information passes across synapses. The table below shows the results.

Toxin	Effect at the synapse
Curare	Decreases the effect of the chemical on neurone X
Strychnine	Increases the amount of the chemical made in the relay neurone

Describe the effect of each of the toxins on the response by muscles.

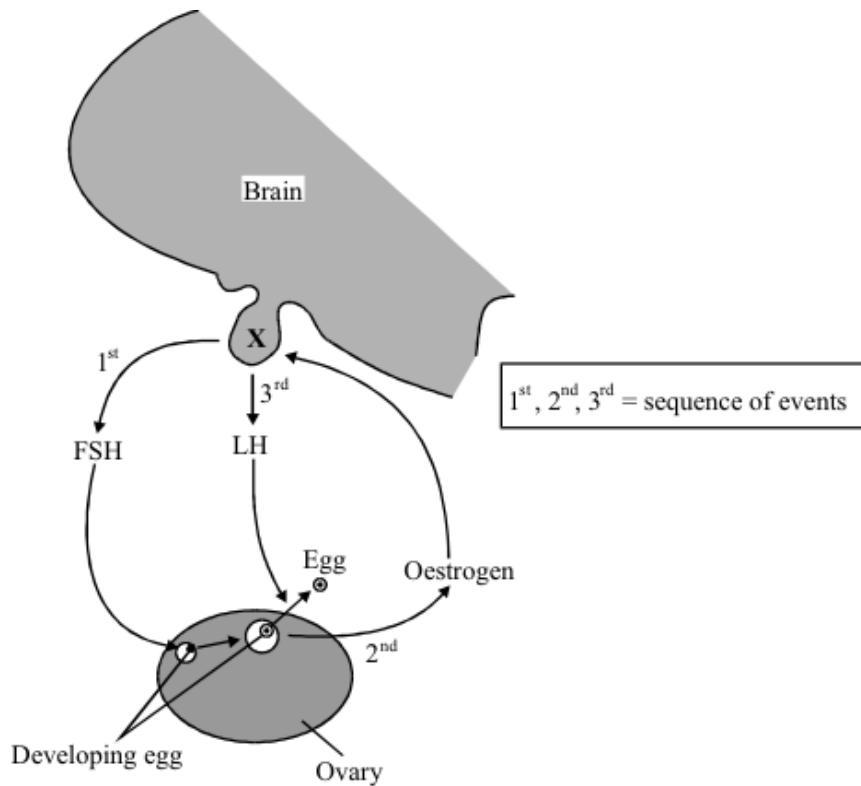
Curare

Strychnine

.....

(2)
(Total 6 marks)

Q2. The diagram shows how three hormones, FSH, LH and oestrogen, work together in a woman's body.



(a) Name the part of the brain labelled **X**.

.....

(1)

- (b) Use information from the diagram and your own knowledge to explain why some oral contraceptive pills contain oestrogen.

.....

.....

.....

.....

.....

.....

(3)
(Total 4 marks)

Q3. Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. The women in Puerto Rico were mainly poor and uneducated.

The scientists selected a pill with a high dose of hormones. The Pill was found to be 100 % effective when taken properly. But 17 % of the women in the study complained of side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.

Evaluate the issues involved with methods used by Pincus in trialling the contraceptive pill.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total 6 marks)

Q4. Hormones are used in contraceptive pills.

(a) Explain how a contraceptive pill works.

.....

.....

.....

.....

(2)

- (b) Read the information about the trialling of the first contraceptive pill.

The Pill was developed by a team of scientists led by Gregory Pincus. The team needed to carry out large scale trials on humans.

In the summer of 1955, Pincus visited the island of Puerto Rico. Puerto Rico is one of the most densely populated areas in the world. Officials supported birth control as a form of population control. Pincus knew that if he could demonstrate that the poor, uneducated women of Puerto Rico could use the pill correctly then so could women anywhere in the world.

The scientists selected a pill with a high dose of hormones to ensure that no pregnancies would occur while test subjects were taking the drug. The Pill was found to be 100% effective when taken properly. But 17% of the women in the study complained of side effects. Pincus ignored these side effects.

The women in the trial had been told only that they were taking a drug that prevented pregnancy. They had not been told that the Pill was experimental or that there was a chance of dangerous side effects.

Evaluate the methods used by Pincus in trialling the contraceptive pill.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(5)
(Total 7 marks)

Q5. The human menstrual cycle is controlled by hormones.

Name the gland which produces:

(i) FSH

.....

(1)

(ii) oestrogen.

.....

(1)

(Total 2 marks)

Q6. A new fertility treatment that could allow women to have IVF in their lunch hour has been developed.

In standard IVF:

- Eggs are fertilised with sperm in a dish in a laboratory.
- Any resulting embryos are incubated and monitored in a laboratory for three to five days.
- The best embryo is transferred to the woman's womb.

Standard IVF treatment can also be used in cases where the male is infertile. In this treatment a sperm nucleus is injected into an egg. The average success rate for standard IVF treatment is 29.6 per cent.

In the *Invozell* technique:

- The *Invozell* device, shown below, is a sealed capsule that allows fertilisation to take place inside the woman's body, in the vagina.



- Eggs are removed from the ovaries while the woman is under sedation.
- The eggs and sperm are put into the *Invozell* capsule.
- The capsule is placed inside her vagina.
- After three days the capsule is removed and the best embryo is transferred to the woman's womb.

This IVF treatment can be performed in a doctor's surgery because at no time are eggs, sperm or embryo stored outside the body. No costs are involved for laboratory incubation.

The *Invozell* company tried the technique on 800 women with a success rate of 19.7 per cent.

(a) In both IVF treatments a woman is given hormones to stimulate her ovaries.

Name the **two** hormones that stimulate the ovaries.

..... and

(2)

(b) Evaluate the use of the *Invozell* technique compared with standard IVF treatment.

Remember to give a conclusion as part of your evaluation.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

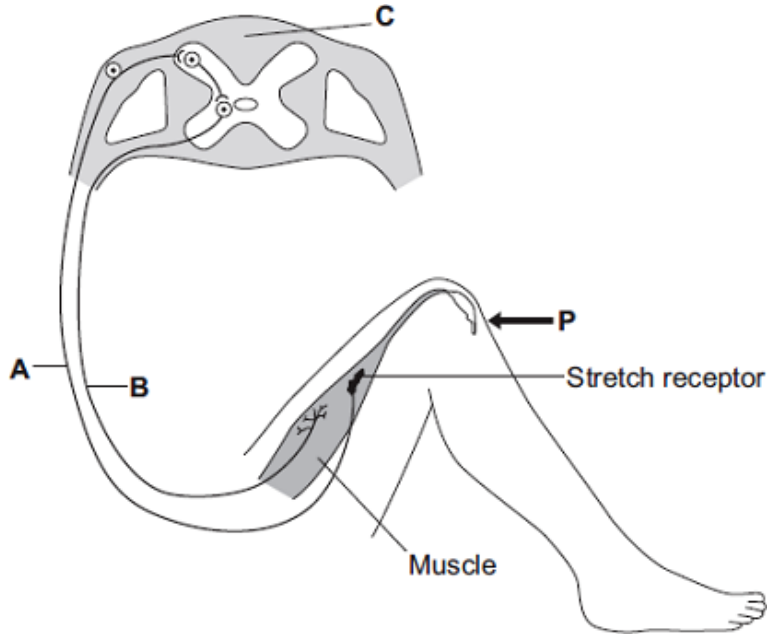
.....

.....

.....

(4)
(Total 6 marks)

Q7. The diagram shows the structures involved in the knee-jerk reflex. When the person is hit at point **P**, the lower leg is suddenly raised.



(a) Name the structures labelled **A**, **B** and **C**.

A

B

C

(3)

(b) How is information passed across a synapse?

.....

(1)

(c) What is the effector in this response?

.....

(1)

(Total 5 marks)

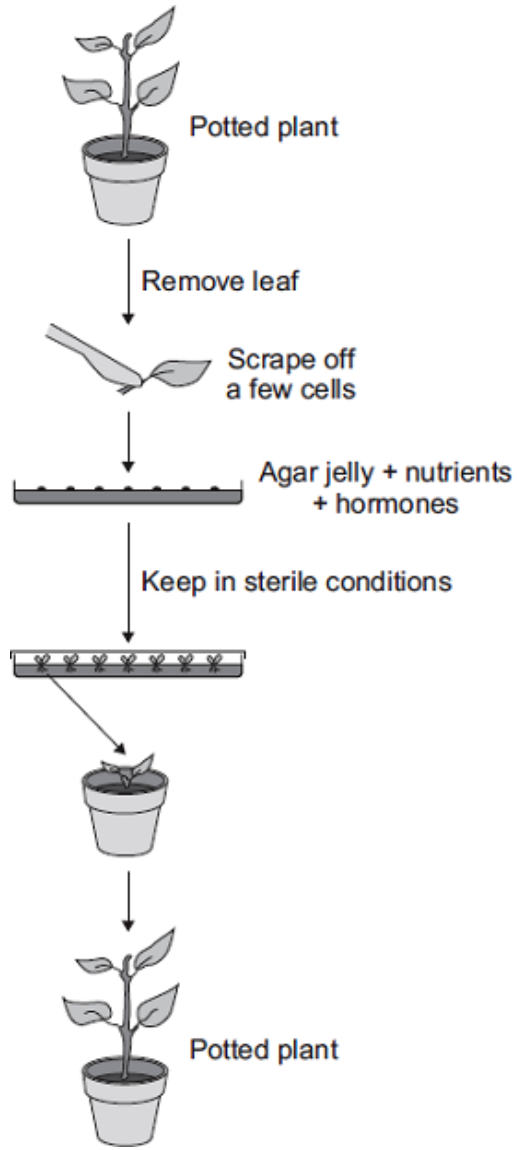
Q8. Plant hormones are used in horticulture.

(a) Name **one** plant hormone.

.....

(1)

(b) The diagram shows how new plants are produced using tissue culture.



(i) Tissue culture is a type of *asexual reproduction* .

Give the main features of *asexual reproduction* .

.....

.....

.....

.....

.....

.....

(3)

(ii) Another method of producing new plants is by taking cuttings.

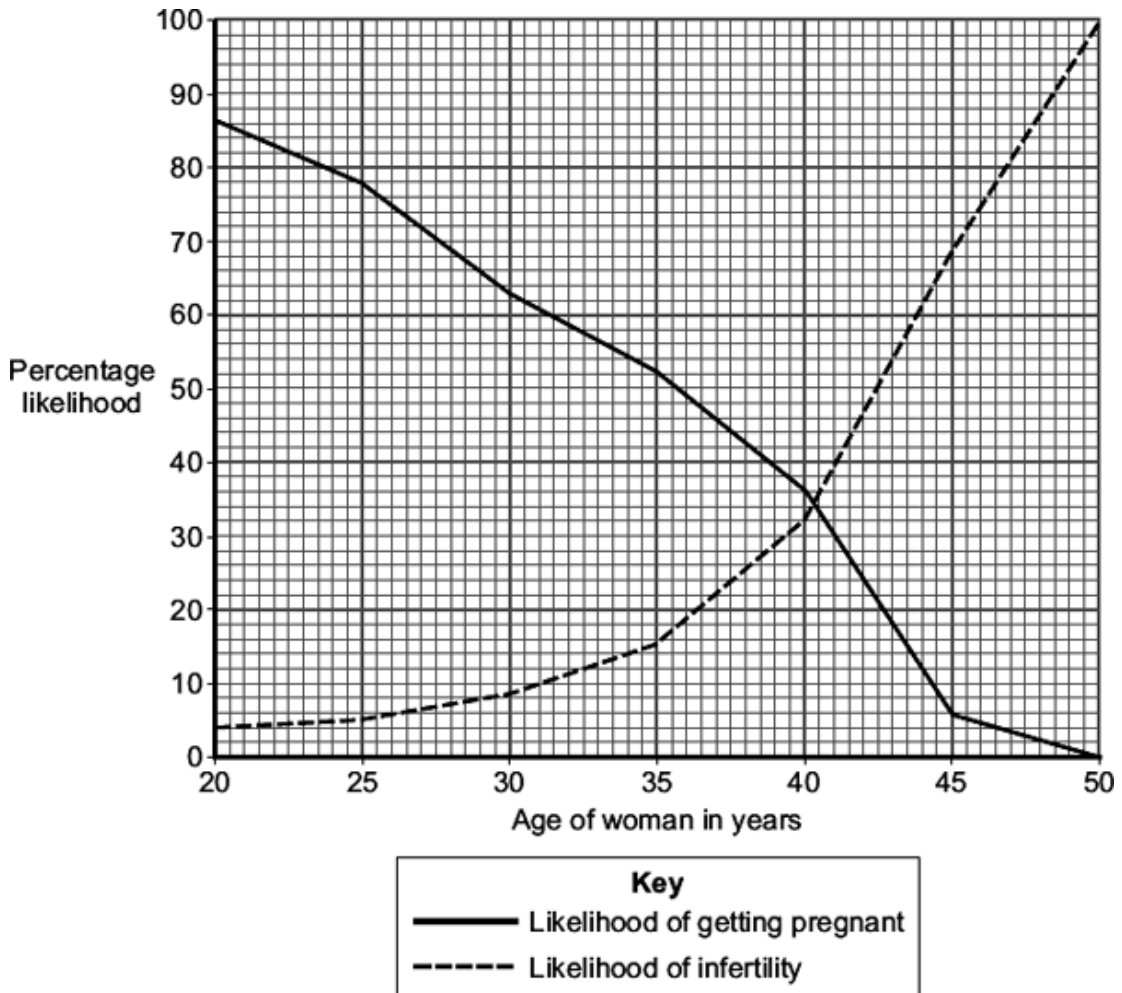
Suggest **one** advantage of using tissue culture and **not** using cuttings to produce plants.

.....
.....
.....

(1)
(Total 5 marks)

Q9. The graph shows how the likelihood of getting pregnant and the likelihood of infertility change with a woman's age.

The data is for healthy women who have unprotected sexual intercourse during one year.



(a) Use information from the graph to answer this question.

A woman in her mid-twenties is thinking about waiting until her late-thirties before she has children.

A doctor advises the woman not to wait.

Explain why the doctor gives this advice.

.....

.....
.....
.....
.....

(2)

(b) The hormones FSH and LH are used in fertility treatment.

Give the function in fertility treatment of:

(i) FSH

.....
.....

(1)

(ii) LH.

.....
.....

(1)

(c) In the first stage of in-vitro fertilisation (IVF), eggs from the mother are fertilised with sperm from the father.

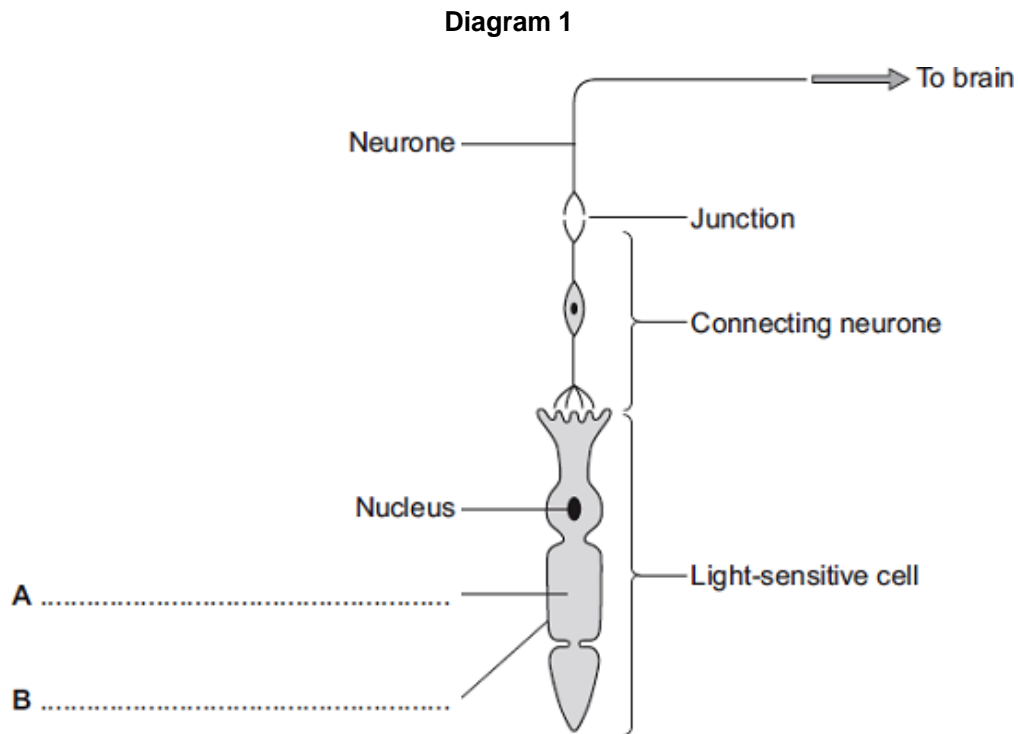
Describe the next stages of IVF.

.....
.....
.....
.....

(2)

(Total 6 marks)

Q10. **Diagram 1** shows cells from the light-sensitive layer in the eye.



(a) On **Diagram 1**, add labels to name part **A** and part **B** of the light-sensitive cell. (2)

(b) There is a junction between the connecting neurone and the neurone carrying the impulse to the brain.

(i) What name is given to the junction?

.....

(1)

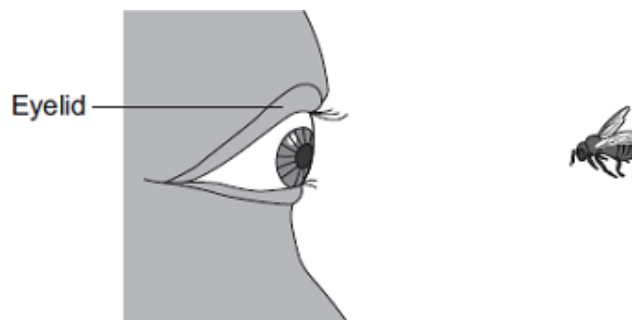
(ii) In what form is information passed across the junction?

.....

.....

(1)

(c) **Diagram 2** shows a bee flying towards a man's eye.



In the *blink reflex*, light from the bee reaches the light-sensitive cell in the eye. The muscles in the eyelid shut the man's eye before the bee hits the eye.

Describe the pathway taken by the nerve impulse in the *blink reflex*.

.....

.....

.....

.....

.....

.....

.....

.....

.....

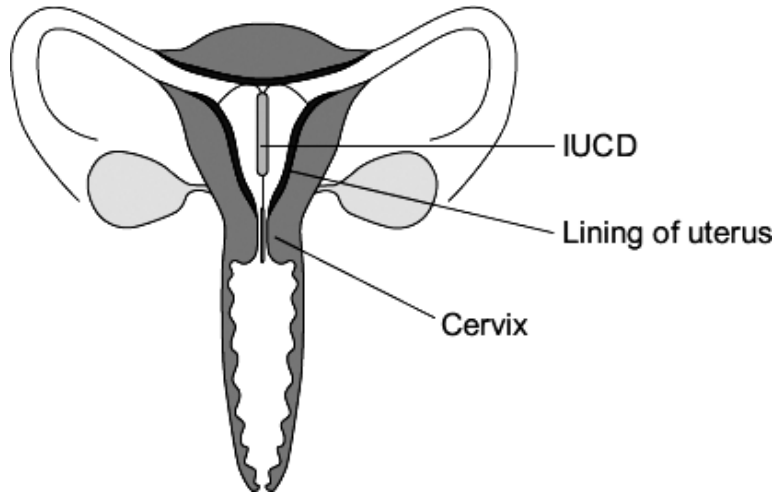
.....

.....

.....

(4)
(Total 8 marks)

Q11. The diagram shows an intra-uterine contraceptive device (IUCD).



The IUCD is put inside the uterus (womb). The IUCD contains a hormone. The hormone diffuses directly into the uterus. The supply of hormone in the IUCD lasts for about five years.

The hormone works by:

- causing the cervix to produce a thick plug of mucus
- causing the lining of the uterus to become very thin.

For every 1000 women using the IUCD for one year about 2 women become pregnant. There are about 10 pregnancies for every 1000 women using the contraceptive pill for one year.

Evaluate the use of the IUCD compared with the contraceptive pill.

Use the information in this question and your own knowledge and understanding.

Remember to give a conclusion to your evaluation.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)
(Total 4 marks)

Q12. The human body produces many hormones.

(a) (i) What is a *hormone*?

.....
.....

(1)

(ii) Name an organ that produces a hormone.

.....

(1)

(iii) How are hormones transported to their target organs?

.....

(1)

(b) Describe how the hormones FSH, oestrogen and LH are involved in the control of the menstrual cycle.

.....
.....
.....
.....
.....
.....
.....
.....
.....

(3)

(Total 6 marks)

- M1.** (a) motor
allow efferent / postsynaptic
*allow **another** relay (neurone)* 1
- (b) release of chemical (from relay neurone)
allow ecf for 'motor' neurone from (a)
allow release of neurotransmitter / named example 1
- chemical crosses gap / junction / synapse
allow diffuses across
allow chemical moves to X 1
- chemical attaches to X / motor / next neurone (causing impulse) 1
- (c) (curare) decrease / no contraction
accept (muscle) relaxes 1
- (strychnine) increase / more contraction
*if no other mark awarded allow 1 mark for (curare) decrease / no response **and** (strychnine) increase / more response* 1
- [6]

- M2.** (a) pituitary (gland / body) 1
- (b) oestrogen inhibits the release of FSH
ignore references to LH 1
- FSH stimulates follicle development / causes egg to develop
or no follicle / egg development if high oestrogen
accept growth / maturing / ripening for development 1
- no ovulation / no egg release
*do **not** accept no egg to be fertilised* 1
- [4]

M3. argued evaluation

- large scale trial gave better results
- chose uneducated women so that if these women could use it correctly, women elsewhere would be able to
- uneducated women unlikely to give informed consent
- no placebo
- used pill with high dose of hormone / should have tried a range of doses / results not valid for other populations
- women not told pill was experimental / pill might have side effects / should have done pre-trial to check for side effects

[6]

M4. (a) inhibits FSH (production / secretion)

1

(therefore) no eggs mature / released
*if no other marks gained allow 1
mark for no eggs produced*

1

or

effect of FSH on ovary described
references to LH are neutral

(b)

maximum 4 marks if no conclusion

Pros max 2marks from 4 marks e.g.

- large scale trial gave better results
- chose uneducated women so that if these women could use it correctly, women elsewhere would be able to cons max 3 marks from 4 marks e.g.
- used pill with high dose of hormone – **either** so results not valid for general use of hormone **or** dangerous
- side effects ignored
- women not told pill was experimental / pill might have side effects
- no placebo
- should have tried a range of doses
- should have done pre-trial to check for side effects

4

conclusion 1 mark e.g.

trials flawed therefore cons outweigh pros

accept reverse e.g. trials flawed but pros outweigh cons

1

[7]

M5.

(i) pituitary

1

(ii) ovary

1

[2]

M6.

(a) FSH / follicle stimulating (hormone)

1

LH / luteinising (hormone)

either order

1

- (b) any **three** from:
max 2 if only advantages or only disadvantages discussed allow reverse arguments

advantages of Invocell eg

- low(er) cost
- quick(er)
- laboratory / incubator / equipment not needed
- more convenient
ignore can be done in doctors surgery

3

disadvantages of Invocell eg

- low(er) success rate
- embryo development cannot be monitored
- can not be used where male is infertile
- only tested on 800 women
- (risk of) infection / pain in vagina
ignore sedation

argued conclusion

*must include reference to **both** advantages and disadvantages and must be at end of answer*

1

[6]

- M7.** (a) **A** sensory (neurone)
ignore nerve

1

- B** motor (neurone)
ignore nerve

1

- C** spinal cord / central nervous system / white matter
accept grey matter

1

- (b) by chemical / substance
allow transmitter

1

	(c) muscle	<i>allow extensor</i> <i>ignore muscle names</i>	1	
				[5]
M8.	(a) auxin	<i>accept other named plant hormones</i>	1	
	(b) (i) any three from:	<ul style="list-style-type: none"> • no (fusion of) gametes / fertilisation <i>allow no meiosis or new cells <u>only</u> produced by mitosis</i> • only one parent <i>allow not two parents</i> • no mixing of <u>genetic</u> material • no <u>genetic</u> variation or <u>genetically</u> identical offspring <i>allow clones</i> 	3	
	(ii) more / many offspring / plants (produced from one parent plant)	<i>allow less damage to parent plant</i> <i>ignore speed / cost</i>	1	[5]
M9.	(a) chance of getting pregnant decreases with age	<i>ignore figures</i>	1	
	chance of infertility increases with age		1	
	(b) (i) causes eggs to mature	<i>allow growth</i> <i>do not accept produced</i> <i>do not accept releases egg</i> <i>ignore references to oestrogen / LH / uterus / womb</i>	1	
	(ii) causes egg release	<i>do not accept matures egg / growth of egg / produces egg</i> <i>ignore references to other hormones and uterus / womb</i>	1	
	(c) embryo	<i>allow (fertilised) egg divides</i>	1	

insert (embryo) into womb / uterus
ignore electric shock

1

[6]

M10. (a) A cytoplasm
in this order only

1

B (cell) membrane
*do **not** accept (cell) wall*

1

(b) (i) synapse

1

(ii) (as) chemical
accept neurotransmitter or named
ignore references to how the chemical is passed
*do **not** accept electrical*

1

(c) (from light-sensitive cell to connecting neurone) to sensory neurone
ignore references to synapses accept 'nerve cell' for neuron(e)
throughout penalise 'nerve' for neurone once only

1

(sensory neurone) to brain / CNS
allow (sensory neurone) to relay neurone / spinal cord

1

(brain / CNS) to motor neurone
allow (relay neurone / spinal cord) to motor neurone

1

(motor neurone) to (eyelid) muscle
ignore effector

1

[8]

M11. any **three** from:

max 2 if only advantages or only disadvantages discussed
ignore 'side effects' unqualified
ignore side effects produced by hormones

advantages of IUCD over pill eg

- can't forget to take it / have to take pill every day
do not allow last 5 years unless qualified
- effect much longer than pill
- more effective in preventing pregnancy
do not allow reference to figures unless qualified
- stops sperm entering uterus

disadvantages of IUCD over pill eg

- pain / uncomfortable / risk of infection / may damage uterus
- prevents fertilised egg developing / 'embryo rights'
allow kills embryo
- needs replacement by doctor / nurse / professional
or access to IUCD is more difficult than pill
or IUCD is harder to come off than pill

3

argued conclusion

*must include a preference and a reference to **both** advantages and disadvantages*
***or** one is better in a given situation but the other is better in a different situation*

1

[4]

M12. (a) (i) any **one** from:

- chemical messenger / message
allow substance / material which is a messenger
- chemical / substance produced by a gland
allow material produced by a gland
- chemical / substance transported to / acting on a target organ
- chemical / substance that controls body functions

1

(ii) gland / named endocrine gland
brain alone is insufficient
allow phonetic spelling

1

(iii) in blood / plasma **or** circulatory system **or** bloodstream

accept blood vessels / named

*do **not** accept blood cells / named*

1

(b) *each hormone must be linked to correct action*

apply list principle

ignore the gland producing hormone

FSH stimulates oestrogen (production) / egg maturation / egg ripening

ignore production / development of egg

1

oestrogen inhibits FSH

allow oestrogen stimulates LH / build up of uterine lining

1

LH stimulates egg / ovum release / ovulation

accept LH inhibits oestrogen

accept LH controls / stimulates

growth of corpus luteum

ignore production of egg

1

[6]

