

# Hormonal Coordination in Humans

## Mark Scheme 1

<b>Level</b>	GCSE (9-1)
<b>Subject</b>	Combined Science – Trilogy - Biology
<b>Exam Board</b>	AQA
<b>Topic</b>	4.5 Homeostasis and Response
<b>Sub-Topic</b>	Hormonal Coordination in Humans
<b>Difficulty Level</b>	Bronze Level
<b>Booklet</b>	Mark Scheme 1

**Time Allowed:** 56 minutes

**Score:** / 55

**Percentage:** /100

**Grade Boundaries:**

M1.(a) pancreas

1

(b) (in the) blood(stream)

*allow in the (blood) plasma*

1

*ignore dissolved **or** in solution*

(c) any **two** from:

- concentration rises and falls in both people
- concentration is higher at start / always in person with diabetes
- concentration rises higher in person with diabetes

*allow correct use of figures*

2

plus any **two** from:

- concentration rises more rapidly in person with diabetes
- concentration stays high for longer in person with diabetes
- concentration does not return to starting level during test in person with diabetes,  
yet concentration returns to starting concentration by 90 minutes in person without diabetes
- concentration goes below starting concentration only in person without diabetes

2

(d) reduce carbohydrate / glucose / sugar in diet

1

(so) blood glucose concentration does not increase as much

1

(so) there is reduced named effect (of prolonged high blood glucose)

*allow reduced short or long term consequences such as tiredness*

**or**  
*increase urination*  
**or**  
*thirst*  
**or** eye / kidney / nerve / heart disease

1

[9]

**M2.(a)** in the blood(stream)

*allow plasma*  
*ignore dissolved or in solution*

1

(b) all three plots correct

*accept two correct plots for 1 mark*

2

suitable line drawn

1

(c) 1 hour

1

(d) 230–185

*identification of steepest part of graph and correct readings taken*

1

= 45

1

(e) line on graph showing extrapolation for person **B**

correct value read from graph (at 130 mg per 100 cm<sup>3</sup>)

*allow 1 mark for a value of 4.5–5 hours if no extrapolation shown*

2

[9]

**M3.(a)** (i) **B**

1

(ii) **D**

1

(iii) C

1

(b) (i) insulin

1

(ii) pancreas

1

[5]

M4.(a) pancreas

*apply list principle*

1

(b) (i) protein

*apply list principle*

1

(ii) any **one** from:

- (controlling / changing) diet  
*accept sugar(y foods) / named eg*  
*ignore references to starch / fat / protein / fibre*
- exercise  
*accept example, eg go for a run*
- pancreas transplant  
*accept named drug eg metformin*

1

(c) (i) increase

*ignore reference to women*

1

then fall

1

relevant data quote (for male)

*eg max at ages 65–74 **or** starts at 10 (per thousand) **or** max at 130 (per thousand) **or** ends at 120 (per thousand)*

*accept a difference between any pairs of numbers in data set*

*accept quotes from scale eg '130' or '130 per thousand' but **not** '130 thousand'; to within accuracy of  $\pm 2$  (per thousand)*

1

- (ii) (between 0 and 64) more females (than males) **or** less males (than females)

*ignore numbers*

*allow eg females more diabetic than males*

1

(over 65) more males (than females) or less females (than males)

*allow eg males more diabetic than females*

1

[8]

M5.(a) pancreas

*allow phonetic spelling*

1

- (b) (i) A

1

shortest / quicker time (to work)

1

- (ii) D

1

acts for longest time

mark dependent on D

allow D will last until 09.00 / breakfast / 24 hours

1

(iii) diet / exercise

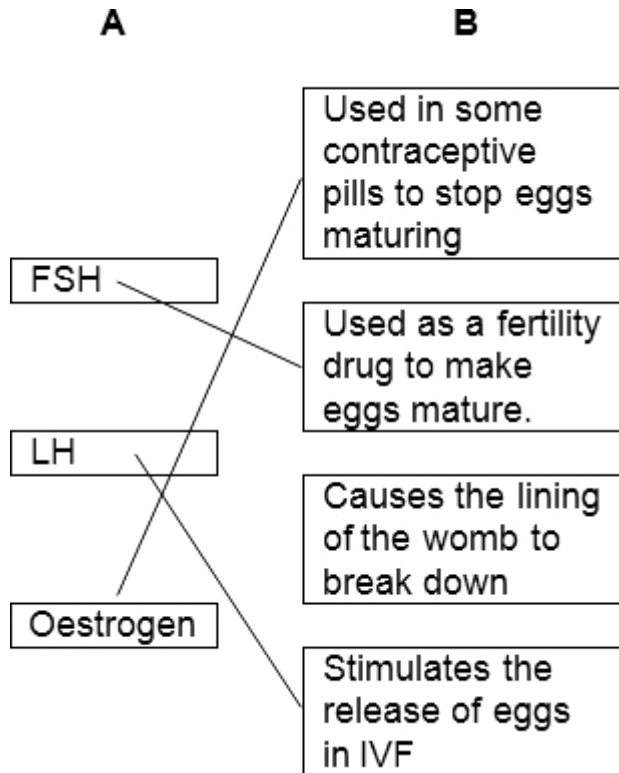
if 'diet' is qualified, then will need correct qualification, e.g.

'less carbohydrate / sugar'

accept pancreas transplant / stem cell treatment

1

[6]



M6.

(a)

mark each line from left hand box

two lines from left hand box cancels mark for that box

3

(b) (i) implant

1

(ii) any **one** from:

*allow explanation for their method in (b)(i)*

- lasts for 5 years / long(est)
- cannot forget to take / replace it / lose it
- (hormone) there all the time  
*ignore expense*  
*ignore STDs*  
*ignore side effects*

1

(iii) any **one** from:

*accept correct disadvantage for wrong method in (b)(i)*

- needs surgery / operation  
*allow it could go wrong*
- painful
- infection
- have to wait five years for a child or more difficult to have a change of mind  
*ignore expense*  
*ignore STDs*  
*ignore side effects*

1

[6]

**M7.** (a) any **two** from:

- FSH  
*do **not** accept FHS*
- LH  
*do **not** accept LSH*
- oestrogen  
*allow progesterone as alternative to any hormone*

2

(b) egg(s) / egg cell(s) / ova

do **not** accept ovaries

do **not** accept fertilised eggs

1

(c) (i) any **one** from:

*ignore faster*

- don't have to take (pill) every day  
*ignore side effects*
- can't forget to take  
*ignore cost*
- more reliable
- lasts 3 years / lasts longer
- hormone level in blood more constant

1

(ii) any **one** from:

*ignore cost*

- eg painful (to insert) / uncomfortable / causes rash  
*ignore side effects unqualified*
- woman can't take it out
- more difficult to stop treatment
- needs to be removed if woman decides to become pregnant  
*allow have to wait three years to become pregnant*

1

[5]

**M8.** (a) insulin

*extra ring drawn cancels the mark*

1



(b) pancreas

*extra ring drawn cancels the mark*

1

(c) diabetes

*extra ring drawn cancels the mark*

1

[3]

M9. (a) pancreas

1

(b) the diabetic should get more energy from fat

1

the diabetic should get less energy from carbohydrate

1

(c) (use) insulin

*allow pancreas / stem cell transplant*

*do **not** allow injection / transplant / stem cells / tablets alone*

*ignore exercise*

1

[4]