M1. (a) B

1

less / no insulin (produced) **or** insulin produced in pancreas

allow pancreas can't monitor (blood) sugar (level)

ignore pancreas can't control (blood) sugar (level)

allow <u>increased</u> glucagon production

*allow A as liver stores less glucose / sugar for **2** marks only*

1

(b) (i) (it / protein / insulin) digested / broken down

if ref to specific enzyme must be correct (protease / pepsin)

ignore denatured

*do **not** accept digested in mouth / other incorrect organs*

1

(ii) any **two** from:

ignore injections

- (attention to) diet

  *accept examples, eg eat less sugar(y food) **or** eat small regular meals*

  allow eat less carbohydrate / control diet

  ignore cholesterol or balanced / healthy diet

- exercise

  ignore keep fit / healthy

- (pancreas) transplant / stem cells / genetic engineering

2

[5]

M2. (a) person with muscle disease:

allow reverse argument for healthy person

any **three** from:

NB all points are comparative except peak (point 3)
*allow use of **two** approximate figures as a comparison*

- higher resting rate **or** higher at start
- when exercise starts / then increases more / more rapidly
  accept description eg rise …. fall
- peaks (then falls)
- levels off later than healthy person
- higher rate during exercise
  *if no other marks awarded allow **1** mark for 'it's higher'*
- greater range

3

(b) (i) oxygen

accept adrenaline
accept O_2
*do **not** accept O, O2 or O^2*

1

(ii) cannot release sugar / glucose (from glycogen)

or

cannot store glucose / sugar (as glycogen)

1

need to receive glucose / sugar (from elsewhere)

ignore oxygen

1

for energy / respiration / cannot store energy

ignore aerobic / anaerobic

1

[7]

M3. (a) (i) chemical

1

(ii) pituitary gland

1

(b) 8

allow 9 or 10

1

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

- progesterone starts being produced at 4 weeks / no progesterone before 4 weeks
- and then / from 4 weeks increases
- oestrogen at constant / low level (from 0) to 20 weeks
- and then / from 20 weeks increases
- from 20 − 36 weeks level of O rises more steeply than that of P

or

- P is always higher than 0 from 6 to 36 weeks

*if no other marks awarded, allow progesterone and oestrogen both increase / rise for **1** mark.*

4

(ii) oxytocin

1

level of oxytocin increases just before birth

1

[9]

M4. (a) (i) rate of chemical reactions (in the body)

1

(ii) any **two** from:

- heredity / inheritance / genetics
- proportion of muscle to fat **or** (body) mass
  allow (body) weight / BMI
- age / growth rate
- gender
  accept hormone balance or environmental temperature
  ignore exercise / activity

2

(b) (i) 77

*correct answer with or without working gains **2** marks*
*allow **1** mark for 70 / 56 **or** 1.25 **or** 5*

2

(ii) increase exercise

accept a way of increasing exercise

1

reduce food intake

accept examples such as eat less fat / sugar
*allow go on a diet **or** take in fewer calories*
ignore lose weight
ignore medical treatments such as gastric band / liposuction

1

[7]

M5. (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 actionapply list principleignore 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]

M6. (a) (i) **A** – pituitary
allow hypothalamus
1

B – ovary / ovaries
1

(ii) in blood (stream)
accept in plasma
ignore dissolved
1

(b) (i) FSH and Luteinising Hormone (LH)
1

(ii) fertilised
OR
reference to sperm
1

form embryos / ball of cells or cell division
1

(embryo) inserted into mother's womb / uterus
allow (fertilised egg) is inserted into mother's womb / uterus
1

(iii) any **one** from:

- multiple births lead to low birth weight
- multiple births cause possible harm to mother / fetus / embryo /

baby / miscarriages
allow premature
ignore reference to cost / ethics / population

1

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

- almost identical
  allow S (slightly) more successful
- both approximately 20%

1

(ii) larger numbers (in clinic R) (in 2007)
allow <u>only</u> 98 (in S) (compared to 1004 (in R))

1

results likely to be more repeatable (in 2008)
allow more reliable
*do **not** accept more reproducible / accurate / precise*

1

[11]

M7. (a) (i) 3.0
accept 3

1

(ii) any **two** from:

- take in water
- take in ions / minerals / nutrients
  accept salts / named ions
  ignore food
- anchorage / support

2

(iii) asexual reproduction

1

(b) (i) a tropism

1

(ii) if tip exposed / **A** – grows / bends towards light
*allow <u>tip</u> of **A** moves towards light*
*ignore **A** responds to light*
allow remained 'straight'

1

if tip covered / **B** – did not grow towards light / remained vertical
*ignore **B** does not respond to light*
ignore phototropism
*<u>only</u> **A** grows towards the light = 2 marks*

1

(c) (i) auxin

1

(ii) hormone comes from the tip

1

more on shady side / moves away from light

allow reference to right-hand side

1

stimulates growth

1

more growth on shady side (than on light side)

answer must be comparative

ignore phototropism

ignore cell division

1

[12]