

Mark schemes

Q1.

- (a) pancreas 1
- (b) the body cells take in a low amount of glucose from the blood 1
- (c) any **two** from:
- (same) diet
 - (same diet for same) duration
 - (same / 30-minute) time before being given glucose
if neither point given allow time
 - (same) volume of water and drug **X**
allow (same) amount of water and drug X
allow 2 cm³ of drink
 - (same) volume of glucose (solution)
allow (same) amount of glucose (solution)
allow 1 cm³ glucose (solution)
if neither bp4 nor bp5 awarded, allow 1 mark for (same) volume / amount of drink
- 2
- (d) 20 **and** 30
- allow an answer in the range 28 to 32 for group A*
- 1
- (30 – 20 =) 10 (minutes)
- allow an answer consistent with values for A between 28 and 32*
- 1
- (e) any **two** from:
- (with drug **X**)
- lower **throughout**
 - lower maximum (concentration)
 - slower increase (in concentration)
 - slower decrease (in concentration)
 - returns to original (concentration) (sooner)
- 2

- (f) use different concentrations of drug X

1

[9]**Q2.**

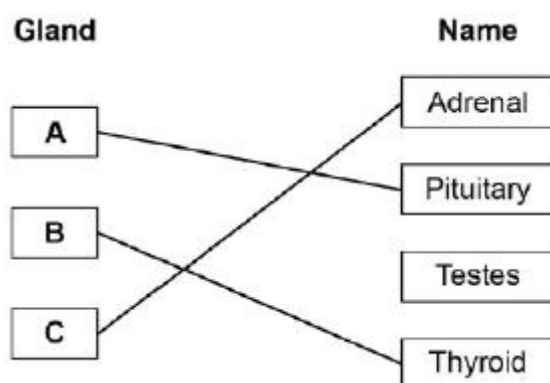
- (a) the endocrine system

1

- (b) by the blood

1

- (c)



do **not** accept more than one line from a box on the left

3

- (d) D

1

- (e) the liver

1

- (f) any **one** from:

- *allow sugar for glucose*
lowers (blood) glucose
- *allow controls (blood) glucose*
(makes) cells / liver / muscles take in glucose
- (changes) glucose to glycogen
allow makes glycogen

1

- (g) follicle stimulating hormone (FSH)

1

- (h) oestrogen

1

progesterone

1

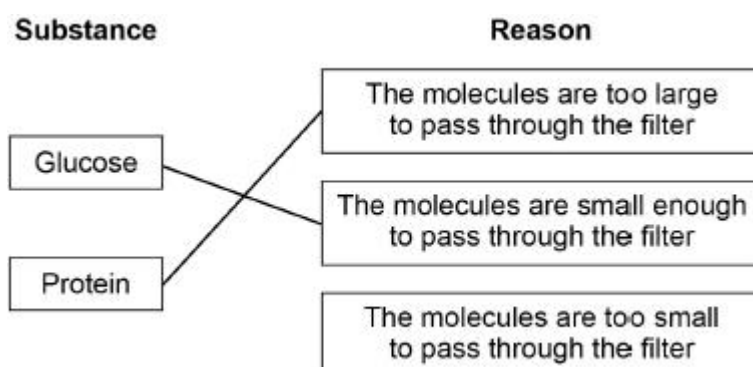
- (i) any **two** from:
- oral contraceptive
allow the pill
 - injection
 - implant
allow contraceptive rod
 - (skin) patch
 - (some) IUDs
allow IUS
allow named methods
allow coil with hormone

2

[13]

Q3.

(a)



*do **not** accept more than one line from a box on the left*

2

(b) 158.1 (dm³)

1

(c) **Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.

5–6

Level 2: Some logically linked reasons are given. There may also be a simple judgement.

3–4

Level 1: Relevant points are made. They are not logically linked.

1–2

No relevant content

0

Indicative content

points for transplant:

- transplant is cheaper
- numerical comparison, eg £18 000 cheaper in first year and £30 000 cheaper in subsequent years
- less / no inconvenience, eg time **or** cost for hospital visits
- less / no restriction on lifestyle
- less / no restriction on diet or fluid intake
- no danger of infection from eg puncturing skin or blood in contact with machine
- less / no possibility of blood clots
- no need to take anti-clotting drugs
- transplanted kidney keeps water / urea / ions in blood at correct level at all times
- feel well all the time

points against transplant:

- danger of rejection
- need tissue match for transplant
- donors in short supply
- possibility of organ damage due to anaesthetic
- possibility of infection in surgery
- possibility of damage due to surgery
- need to take immunosuppressant drugs
- may suffer other infections due to suppressed immune system
- may need repeat operation (after about 10 years)

For **Level 3** students should refer to both points for and points against.

(d) $4 \times 5\,000 = 20\,000$

1

$20\,000 + 17\,000$

allow $25\,000 + 17\,000$

1

(£) $37\,000$

allow $(25\,000 + 17\,000) = (£) 42\,000$

1

[12]

Q4.

(a) oestrogen	1
progesterone	1
(b) FSH causes an egg to mature in the ovary	1
(c) (from day) 9 (to day) 15 <i>do not accept (from day) 15 (to day) 9</i>	1
(d) Level 3: Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5–6
Level 2: Relevant points (reasons/causes) are identified and there are attempts at logical thinking. The resulting account is not fully clear.	3–4
Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical thinking.	1–2
No relevant content	0
Indicative content	
<ul style="list-style-type: none"> • oral contraceptive / the 'pill' <ul style="list-style-type: none"> ◦ (contains hormones / oestrogen / progesterone) to prevent egg / follicle maturing or prevents ovulation • injection / implant / skin patch <ul style="list-style-type: none"> ◦ (contains hormones / oestrogen / progesterone) to prevent egg / follicle maturing or prevents ovulation • condom / femidom <ul style="list-style-type: none"> ◦ prevents sperm reaching egg or prevents sperm entering woman's body / vagina • diaphragm <ul style="list-style-type: none"> ◦ prevents sperm reaching egg / womb / oviduct • IUD <ul style="list-style-type: none"> ◦ prevents implantation or releases hormone / progesterone to prevent ovulation or (releases copper ions to) thicken mucus and prevent sperm passage 	

- spermicide
 - kills sperm
- sterilisation / vasectomy / tubular ligation
 - prevents passage of sperm / egg
- rhythm method
 - no egg available for fertilisation

[10]

Q5.

- (a) an answer in the range 1.1 to 2(.0) (hours) 1
- (b) *effect:* lowered 1
- explanation:*
 glucose taken in
or
 glucose converted to glycogen
or
 glucose used in respiration 1
- by cells / liver / muscles 1
- (c) underweight 1
- (d) (from) 67.5 (kg to) 90 (kg)
allow in the range 67 to 68 (kg) for 67.5 (kg)
allow in the range 90 to 90.5(kg) for 90 (kg)
allow from 90 (kg to) 67.5 (kg) 1
- (e) (person **C** has) higher glucose (than mean)
allow comparison of higher glucose using numbers
*allow (person **C**'s) glucose is too high* 1
- (person **C** has) higher insulin (than mean)
allow comparison of higher insulin using numbers
*allow (person **C**'s) insulin is too high*
*do **not** accept (person **C** has) higher cholesterol*
ignore unprocessed data 1
- answers must be comparative*

(f) more exercise

allow example of (more) exercise

1

eat less carbohydrate / sugar **or** eat a low carbohydrate diet

allow eat less fat

allow eat a carbohydrate

controlled diet

*if no other marks awarded allow **1** mark for*

lose weight

or *maintain healthy weight*

or *eat less*

or *eat fewer calories*

ignore references to healthy / balanced diet or diet

unqualified

1

[10]