

Control in the human body

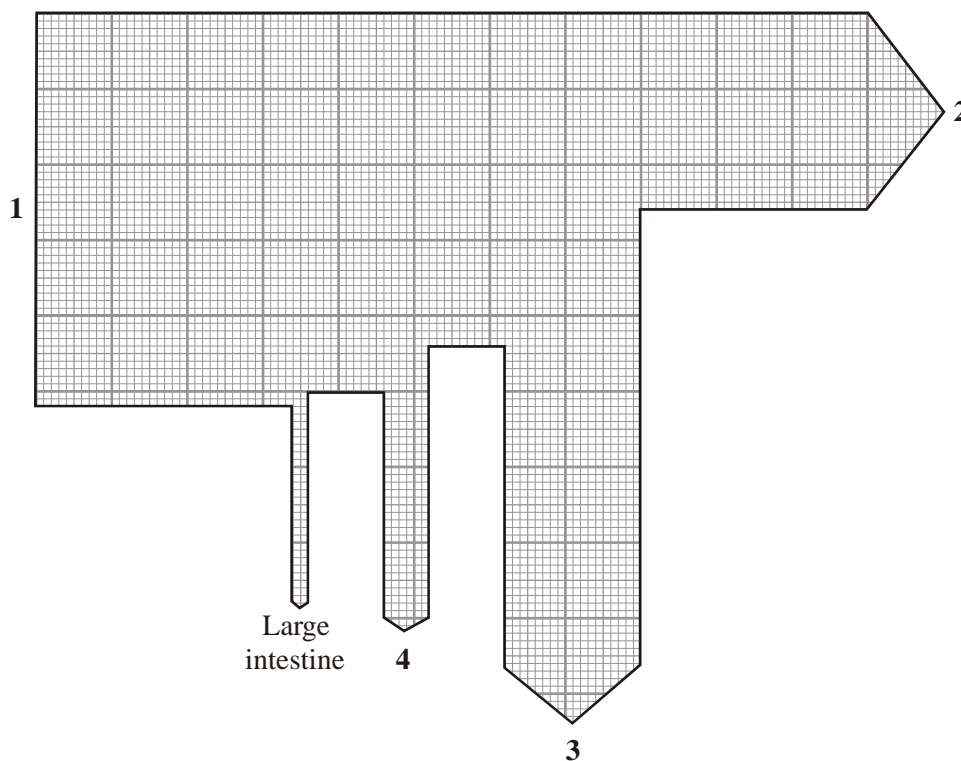
1. This question is about water loss from the body.

The table shows the volume of water lost from the body.

Organ	Water loss in cm ³ per day
kidney	1300
lungs	300
skin	900
large intestine	100

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** on the Sankey diagram.

- A** total water loss from the body
- B** water loss from the kidneys
- C** water loss from the lungs
- D** water loss from the skin



(On the Sankey diagram, the thicker the arrow the greater the proportion)

2. Hormones are involved in the menstrual cycle.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

- A** eggs
- B** ovaries
- C** pituitary gland
- D** womb

FSH is produced by the . . . **1**

FSH causes . . . **2** . . . to mature.

Oestrogen is produced by the . . . **3**

In IVF, embryos are inserted into the mother's . . . **4**

3. In vitro fertilisation (IVF) is used to help women who have difficulty conceiving.

- (a) Which hormone treatment is given to a woman during IVF?

- 1** FSH is given to stimulate eggs to mature.
- 2** Progesterone is given to stimulate eggs to mature.
- 3** Oestrogen is given to stimulate the thickening of the lining of the womb.
- 4** FSH is given to stimulate the release of eggs.

- (b) Which statement correctly describes one stage in IVF treatment?

- 1** Sperm cells are inserted into the mother's womb when eggs are released from the ovary.
- 2** Fertilised eggs develop into embryos outside the mother's body.
- 3** Eggs are collected from the mother after every menstrual period.
- 4** Fertilisation takes place inside the woman's body.

The table shows the effectiveness of IVF treatment in a fertility clinic in 2004 and 2005.

	2004				2005			
Age of women	Under 35	35 – 37	38 – 40	Over 40	Under 35	35 – 37	38 – 40	Over 40
Number of IVF treatments	130	100	29	20	142	62	33	11
Average number of embryos transferred	2.6	2.8	3.3	3.6	2.5	2.8	3.0	3.2
Percentage of successful pregnancies	43	30	21	13	43	48	30	27

- (c) What conclusion can be drawn from the data?
- 1 The more embryos transferred, the greater the chance of a successful pregnancy.
 - 2 There were more multiple births in 2005 than in 2004.
 - 3 Older women are less likely to have a successful pregnancy by IVF.
 - 4 More women were given IVF treatment in 2005 than in 2004.
- (d) Many people oppose the use of IVF.

What information from the table could be used by people campaigning against IVF on ethical grounds?

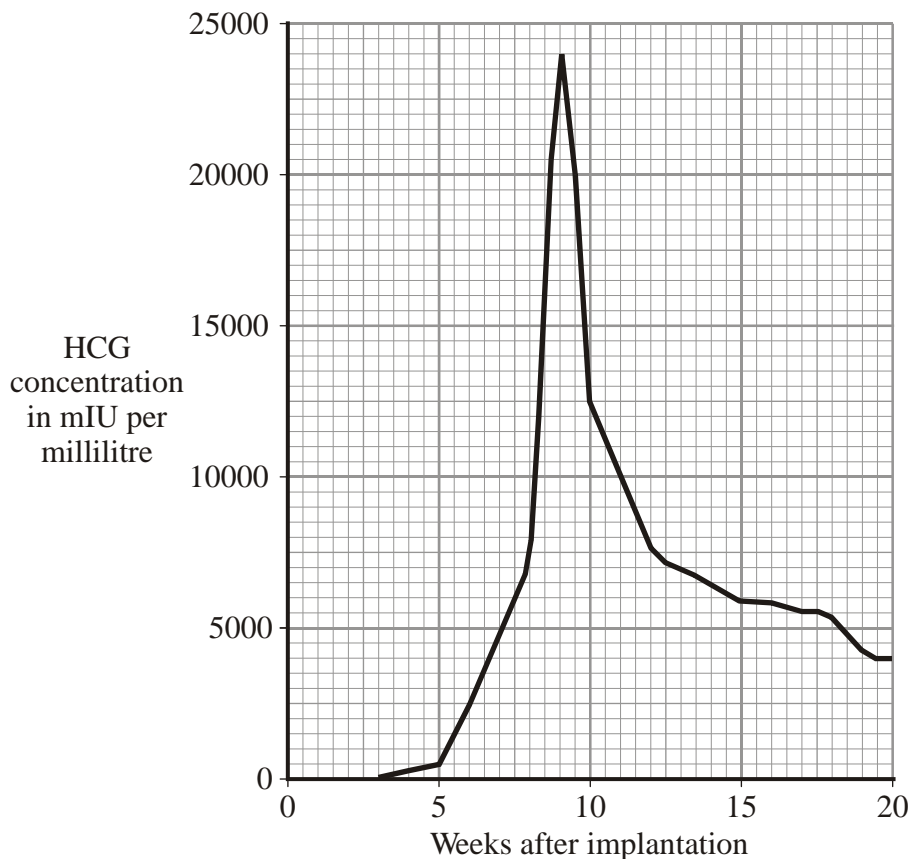
- 1 A high proportion of women in the country are being treated with IVF.
- 2 High doses of hormones cause side effects in many women.
- 3 Many embryos die in IVF treatment.
- 4 IVF treatment is too expensive for most women.

Unit B1, B1.2.2

4. In each part choose only **one** answer.

- A** When an embryo becomes implanted in the wall of the womb, an organ called a placenta develops. In addition to absorbing nutrients from a mother's blood, the placenta secretes a hormone called human chorionic gonadotrophin (HCG).

The graph shows the changes in the concentration of HCG in a mother's blood during the first 20 weeks after implantation.



What is the rate of increase in the concentration of HCG from week 5 to week 9?

- 1 3833.3 mIU per millilitre per week
- 2 4800.0 mIU per millilitre per week
- 3 5875.0 mIU per millilitre per week
- 4 5937.5 mIU per millilitre per week

The table shows the concentration of HCG in the blood of pregnant women between day 14 and day 24 after implantation. The concentration of HCG in the blood is used by doctors as a test for pregnancy.

Days after implantation	Average blood HCG concentration in mIU per millilitre	Highest blood HCG concentration in mIU per millilitre	Lowest blood HCG concentration in mIU per millilitre	Number of women tested
14	48	119	17	12
15	59	147	17	18
16	95	223	33	23
17	132	429	17	21
18	292	758	70	19
19	303	514	111	23
20	522	1690	135	13
21	1061	4130	324	12
22	1287	3279	185	22
23	2034	4660	506	13
24	2637	10000	540	16

- B** The greatest difference between the average blood HCG concentration occurred between . . .
- 1 day 17 and day 18.
 - 2 day 19 and day 20.
 - 3 day 21 and day 22.
 - 4 day 22 and day 23.
- C** What is the advantage to doctors of giving the range in the data?
- 1 Doctors can be reasonably sure that the results of the pregnancy tests are positive if the results are within the range of the data.
 - 2 Doctors know that a reading below 48 at day 14 indicates a negative result of a pregnancy test.
 - 3 Figures outside the range of the data can indicate possible defects in the embryo.
 - 4 When carrying out a pregnancy test, results outside the range of the data can be ignored.
- D** What is the most probable reason for the wide range of blood HCG concentrations at a particular time after implantation?
- 1 There are genetic variations in the people tested.
 - 2 Some of the results are anomalous.
 - 3 The instruments were not used correctly.
 - 4 The instruments used are not sensitive enough.