

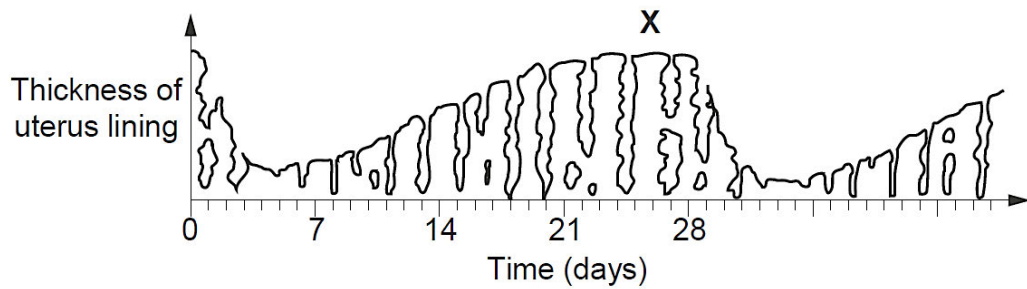
GCSE Biology A (Gateway)

J247/03 B1-B3 and B7 Higher (Higher Tier)

Question Set 17

1 (a)

Look at the diagram. It shows changes to the uterus lining during the menstrual cycle.



(i) Which hormone would peak at point X? **Progesterone** [1]

(ii) Name **two** hormones that peak immediately before ovulation.
Oestrogen and LH [1]

(b) Explain how hormones can be used by women for contraception [4]

Some contraceptive methods such as the mini-pill, IUS and implant involve the introduction of progesterone into the body. Progesterone stimulates the secretion of thick cervical mucus which impedes the movement of sperm. It thins the uterus lining, reducing the likelihood of blastocyst implantation, and also inhibits FSH and LH production, preventing ovulation. The combined pill and patch involve the input of oestrogen as well as progesterone. Oestrogen prevents maturation of follicles by inhibiting FSH.

(c) Which hormone works with insulin to control blood sugar levels in the body?

Tick (✓) **one** box.

- | | |
|-------------|-------------------------------------|
| Gibberellin | <input type="checkbox"/> |
| Glucagon | <input checked="" type="checkbox"/> |
| Glucose | <input type="checkbox"/> |
| Glycogen | <input type="checkbox"/> |

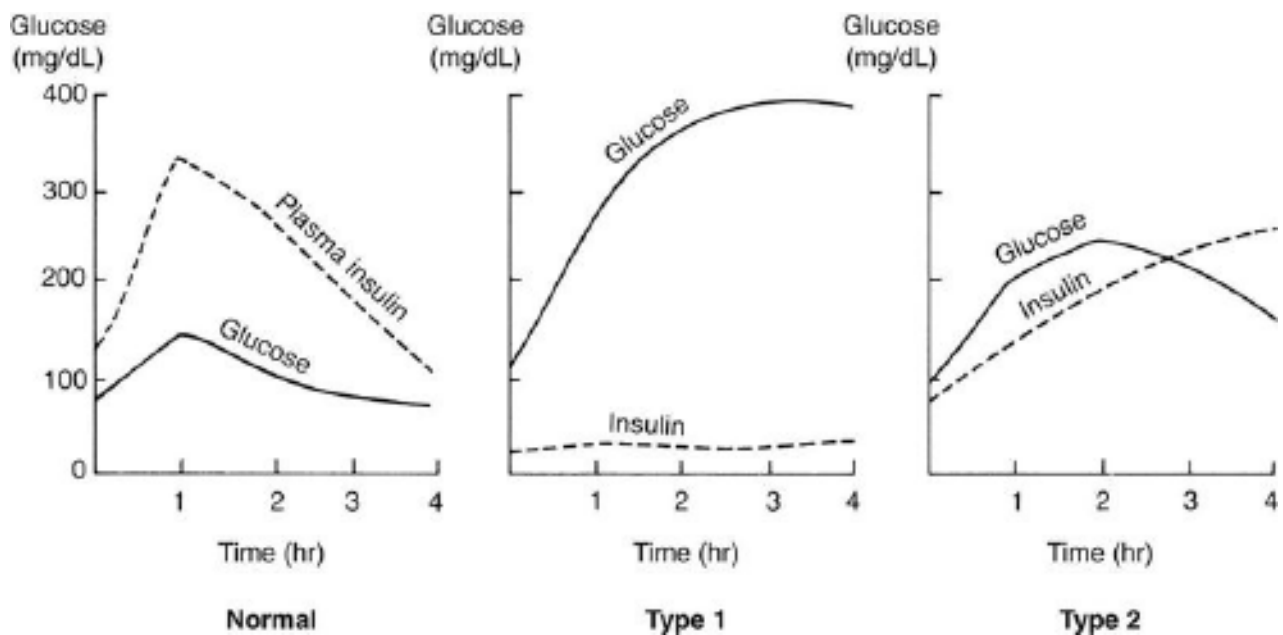
[1]

(d) A glucose tolerance test can help identify diabetes.

The graphs show a glucose tolerance test in three people, A, B and C.

One person is healthy, and two people have different types of diabetes.

Key
—— Glucose
- - - - Insulin



(i) Which person has type 2 diabetes?

Individual C

[1]

(ii) Explain the reasons for your choice in part (d)(i).

[2]

Insulin is still produced, although less rapidly than in the normal person, individual A. Glucose concentration rises more rapidly to a greater level than in the healthy person suggesting that the body cells are resistant to insulin. This is characteristic of type 2 diabetes.

- (e) Scientists are using human embryonic stem cells to grow cells to treat type 1 diabetes.

Explain why scientists use embryonic rather than adult stem cells.

[2]

Embryonic stem cells are unspecialised so are capable of dividing into any cell type, whereas adult stem cells can only differentiate into a limited range of cell types. Embryonic stem cells are also capable of propagating themselves indefinitely so are useful in the rapid production of insulin-producing cells.

- (f) Plant development is also controlled by hormones.

Describe **one** effect of gibberellins and **one** effect of ethene on plant development.

[2]

Gibberellins cause stem elongation in plants. Ethene causes fruit ripening.

Total Marks for Question Set 17: 14

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