Section 13.1 – The principles of feedback mechanisms

Set point – desired level at which the system operates
A receptor – Detect deviation from the set point
A controller – coordinates information from different sources
An effect – carries out corrective measures to return to set point
Feedback loop – Informs the receptor of changes brought about by the effector

Negative feedback

Occurs when feedback results in the corrective measures being turned off
Having separate negative feedback mechanisms that control departures from the norm in either direction give a greater degree of homeostatic control

Positive feedback

Occurs when feedback causes corrective measures to remain turned on
An Example would be when a stimulus causes sodium ions to enter the axon. When more sodium ions enter, the potential across the membrane increases and causes other sodium-gated channels to open thus causing an even greater amount of sodium ions to move into the axon

Section 13.2 – The oestrous cycle

The pituitary gland is found and the base of the brain and releases two hormones:

1.) **Follicle Stimulating hormone (FSH) –** Stimulates follicles to grow and mature and so start producing oestrogen
2.) **Luteinising hormone (LH)** – causes ovulation and stimulates the ovary to produce progesterone from the corpus leuteum

The ovaries produce two other hormones

1.) **Oestrogen** – produced from growing follicle and causes the rebuilding of the uterus lining. Stimulates the production of LH
2.) **Progesterone –** Maintains the lining of the uterus and inhibits the production of FSH

<u>The menstrual cycle</u>

- Days 1 – 5 – Uterus lining is shed.
- Day 1 – Pituitary gland produces FSH which travels in the blood and stimulates follicles to grow/mature
- The follicles secrete oestrogen which causes the rebuilding of the uterus lining and inhibits the production of FSH and LH from the pituitary gland
- As the follicle grows it produces increasing amounts of oestrogen, reaching a critical point (~day 10) where it begins to stimulate the production of FSH and LH (positive feedback)
- There is a surge in FSH and LH production
- More LH produced causes ovulation and so the matured follicle releases its egg (Day 14)
- Once ovulation has occurred, LH stimulates the empty follicle to develop into a corpus luteum which secretes progesterone (and small amount of oestrogen)
- The progesterone maintains the lining of the uterus and inhibits the production of FSH and LH
- If the egg is not fertilised the corpus luteum will degenerate and no longer produce progesterone and so the uterus lining breaks down
- Since there is less progesterone produced, FSH is no longer inhibited and so the cycle resumes