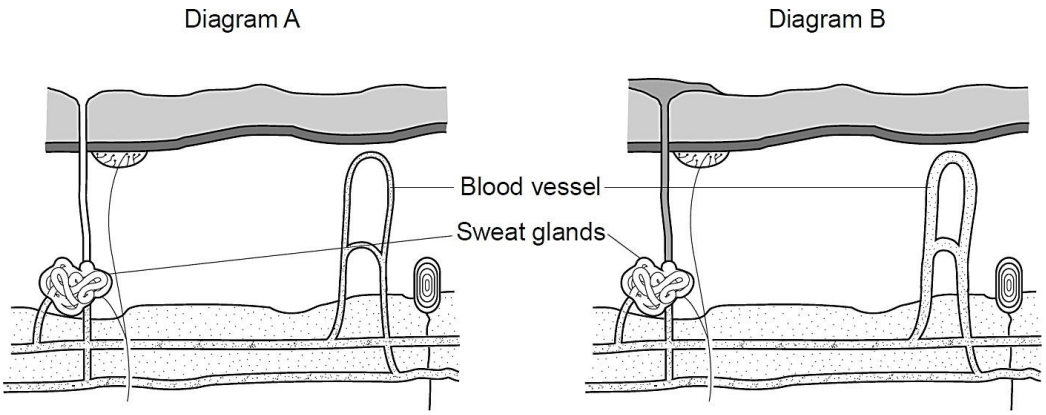
GCSE Biology A (Gateway)

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

Question Set 12

1 This question is about control and coordination.

(a) The diagrams show a section through the skin in two different conditions.



Which diagram shows the skin in a hot, humid environment?

Explain your answer.

Diagram B because it shows vasodilation. The blood vessels release more heat to environment and sweat is released to evaporate and cool the body down.

[3]

(b) Adrenaline is an important hormone in the body. It helps to prepare the body for a 'fight or flight' response.

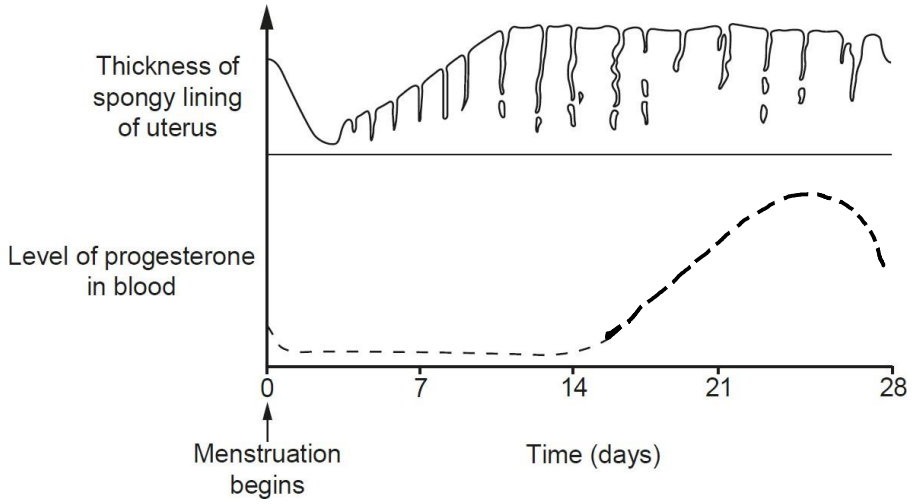
Sports injuries which involve cuts and bleeding are often treated with a dilute solution of adrenaline.

Explain why.

Adrenaline reduces blood flow to the skin so less blood is lost while waiting for treatment.

[3]

(c) The graph shows how the lining of the uterus changes during the menstrual cycle and also shows the level of progesterone in the blood.



(i) Where in the ovary is progesterone produced?

Corpus luteum

[1]

(ii) Draw a line to continue the graph to show the levels of progesterone until day 28 (assume that an egg has not been fertilised).

[2]

(d) **(i)** An egg develops in a follicle before ovulation. The follicle has a diameter of 25×10^{-3} mm at the start. This follicle grows to 20 mm in diameter just before the egg is released.

Calculate the increase in size of the diameter of the follicle.
Give your answer to **2** decimal places.

$20 - (25 \times 10^{-3}) = 19.975\text{ mm}$

$= 19.98\text{mm}$ to 2 dp

[3]

(ii) The failure of a follicle to increase in size can result in less production of oestrogen.

Explain what effect this may have on the uterus.

The lining is not repaired correctly.

[1]

(iii) Explain how hormones can be used to treat infertility in women.

FSH and LH are used. FSH leading to ripening of follicle and LH causes ovulation.

[2]

(iv) Infertility can also be caused by problems in the male.

Plasmin is a protease enzyme important in sperm movement.

Explain how changes to the structure of DNA could result in the plasmin enzyme being faulty.

The order of bases in the gene is changed so the order of amino acids changed in protein. Enzymes are proteins and so the enzyme will change in shape leading to it not functioning properly. **[2]**

Total Marks for Question Set 12: 17