# A Level Biology A

**H420/01** Biological Processes

## Question Set 8

**8 (a) (i)** Gestational diabetes is a medical condition that affects pregnant women. It results in highlevels of glucose in the blood, even though the woman produces normal levels of insulin.

Gestational diabetes is most similar to which **other** type of diabetes? Explain your answer. **[2]**

Type 2 diabetes because insulin is still produced but cells of the liver develop resistance to it.

**8 (a) (ii)** Gestational diabetes is a medical condition that affects pregnant women. It results in highlevels of glucose in the blood, even though the woman produces normal levels of insulin.

Suggest **two** ways a woman with gestational diabetes can manage her condition. **[2]**

Regular exercise. Control diet and reduce intake of refined sugars.

**8 (b) (i)** Skeletal muscle is one of the main tissues where glucose is removed from the blood in response to insulin.

Name the other tissue. **[1]**

Liver tissue

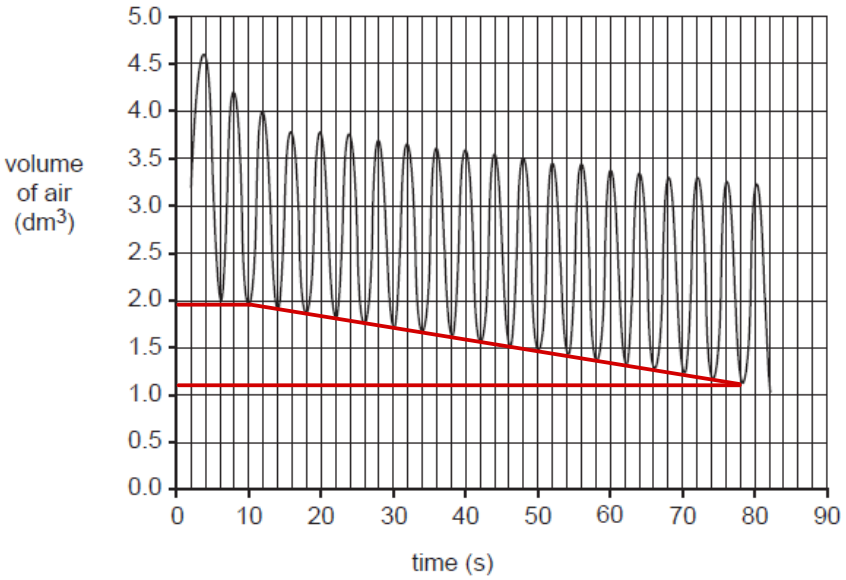
**8 (b) (ii)** Explain why glucose is required for the contraction of skeletal muscle. **[3]**

Glucose is required as a respiratory substrate to produce ATP during respiration. ATP is required in skeletal muscle for the breaking of actin-myosin cross-bridges and its hydrolysis provides the energy to 're-cock' the myosin heads.

**8 (c)** During late pregnancy, women find ventilation more difficult, as the developing foetus reduces the volume of the thorax. This can lead to tiredness and difficulty breathing.

A student used a spirometer to measure ventilation in a woman who was 36 weeks pregnant.

The figure shows the trace produced.




Mean oxygen uptake rate at rest in women is around 0.020 $dm^3\ s^{-1}$.

Using these data, the student made the following conclusion:

My data show that being pregnant reduces rate of oxygen uptake by up to 20%.

Use the data to evaluate this claim. **[3]**

$\frac{1{\cdot}95-1{\cdot}10}{78-10} = 0{\cdot}0125\ dm^3\ s^{-1}$

Reduction in rate of $O_2$ uptake $= \frac{0{\cdot}02-0{\cdot}0125}{0{\cdot}02} \times 100 = 37{\cdot}5\%$

The statement is incorrect. From the graph, the reduction in the rate of oxygen uptake was calculated to be 37·5% which is higher than 20%. Also, the data was collected from a woman who was 36 weeks pregnant. The data collected is therefore not representative of the entire pregnancy so it is not valid for the student to solely use the phrase 'being pregnant' in their conclusion.

## Total Marks for Question Set 8: 11