$^{9}/_{12}$

L5 Ultrasound

L5.1 Give a typical frequency of ultrasound as used in medical imaging.

L5.2 Give the name for the phenomenon which allows certain crystals to produce ultrasound when an alternating voltage is applied to them.

L5.3
a) In one word: what do ultrasound waves reflect off?
b) The strength of the reflection is determined by…
c) Why can't you use ultrasound to image the lungs?

L5.4 If a single beam of ultrasound waves is used, an A-scan is produced. Sketch what an A-scan trace might look like. Make sure that you label the axes with what is being plotted.

L5.5 A B-scan gives a 2-dimensional image. How does the scan head for a B-scanner need to be different to that used only for A-scans?

L5.6 Why is the patient smeared in gel before an ultrasound scan is conducted?

L5.7 Why is ultrasound the wave of choice for pre-natal scanning?

L5.8 Give one **therapeutic** use of ultrasound (i.e. a medical use where the ultrasound treats a condition rather than taking pictures of it).

L5.9 If the reflection off the back of a foetus's head takes 0.092 ms longer to reach the receiver than the reflection off the front of the head, calculate the size of the foetus's head. Assume that the speed of ultrasound is $1400\,\text{m s}^{-1}$.

L5.10 What can **Doppler ultrasound** be used for?