10 **(a)** Define specific acoustic impedance.

.....

.....

..... [2]

(b) Explain how ultrasound waves are detected by a piezoelectric crystal.

.....

.....

..... [2]

(c) Table 10.1 shows the specific acoustic impedance Z for body tissue, water and steel.

Table 10.1

material	Z / kg m^{-2} s^{-1}
body tissue	1.38×10^6
water	1.48×10^6
steel	4.04×10^7

(i) Calculate the intensity reflection coefficient for ultrasound incident on a water–steel boundary.

intensity reflection coefficient = ... [2]

(ii) Explain, without calculation, what is likely to happen when ultrasound is incident on a body tissue–water boundary.

.....

.....

..... [2]

[Total: 8]