

## Medical imaging

Specification reference	Checklist questions	
6.5.1 a	Can you describe the basic structure of an X-ray tube (components: heater (cathode), anode, target metal and high-voltage supply)?	<input type="checkbox"/>
6.5.1 b	Can you describe the production of X-ray photons from an X-ray tube?	<input type="checkbox"/>
6.5.1 c	Can you define these X-ray attenuation mechanisms: simple scatter, photoelectric effect, Compton effect, and pair production?	<input type="checkbox"/>
6.5.1 d	Can you explain the attenuation of X-rays?	<input type="checkbox"/>
6.5.1 d	Can you demonstrate that $I = I_0 e^{-\mu x}$ ?	<input type="checkbox"/>
6.5.1 e	Can you describe X-ray imaging with contrast media?	<input type="checkbox"/>
6.5.1 f	Can you describe computerised axial tomography (CAT) scanning and the necessary components?	<input type="checkbox"/>
6.5.1 g	Can you explain the advantages of a CAT scan over an X-ray image?	<input type="checkbox"/>
6.5.2 a	Can you describe the medical tracers technetium-99m and fluorine-18?	<input type="checkbox"/>
6.5.2 b	Can you describe the gamma camera and its components, and the formation of gamma camera images?	<input type="checkbox"/>
6.5.2 c	Can you explain diagnosis using the gamma camera?	<input type="checkbox"/>
6.5.2 d	Can you define positron emission tomography (PET)?	<input type="checkbox"/>
6.5.2 e	Can you explain diagnosis using PET scanning?	<input type="checkbox"/>
6.5.3 a	Can you explain ultrasound frequency?	<input type="checkbox"/>

Specification reference	Checklist questions	
6.5.3 b	Can you define the piezoelectric effect?	<input type="checkbox"/>
6.5.3 b	Can you define ultrasound transducers?	<input type="checkbox"/>
6.5.3 c	Can you describe ultrasound A-scans and B-scans?	<input type="checkbox"/>
6.5.3 d	Can you calculate the acoustic impedance of a medium, $Z = \rho c$ ?	<input type="checkbox"/>
6.5.3 e	Can you explain the reflection of ultrasound at a boundary?	<input type="checkbox"/>
6.5.3 e	Can you demonstrate that $\frac{I_r}{I_0} = \frac{(Z_2 - Z_1)^2}{(Z_2 + Z_1)^2}$ ?	<input type="checkbox"/>
6.5.3 f	Can you describe impedance (acoustic) matching?	<input type="checkbox"/>
6.5.3 f	Can you explain the use of gel in ultrasound scanning?	<input type="checkbox"/>
6.5.3 g	Can you describe the Doppler effect in ultrasound?	<input type="checkbox"/>
6.5.3 g	Can you calculate the speed of blood $v$ in the body: $\frac{\Delta f}{f} = \frac{2v \cos \theta}{c}$ ?	<input type="checkbox"/>