10 **(a)** X-rays for use in medical diagnosis are produced in an X-ray tube. In the X-ray tube, charged particles are accelerated towards a metal target by an applied potential difference (p.d.).

(i) State the name of the charged particles that are accelerated by the applied p.d.

..... [1]

(ii) Explain how X-rays are produced at the metal target.

.....

.....

.....

..... [2]

(iii) Calculate the minimum wavelength of X-rays produced when the applied p.d. is 5.80 kV.

wavelength = ... m [3]

(b) X-rays pass through a medium that has an attenuation coefficient of $1.4\,cm^{-1}$.

Calculate the percentage of the X-ray energy that is **absorbed** by a 2.8 cm thickness of this medium.

percentage absorbed = ... % [3]

[Total: 9]