

## Answers to selected questions

### Chapter 18

- Q6** Mass (neglecting a minute relativistic effect) is conserved in a chemical reaction when all reactants and products are taken into account.
- Q12** X-rays are electromagnetic waves of very short wavelength.
- Q18** No. There were three different types of radiation (alpha, beta, and gamma rays) given off by the materials containing uranium and thorium. The alpha and beta rays turned out to be charged particles and the gamma rays were electromagnetic radiation with energies greater than those of X-rays.
- Q24** In an elastic collision of a heavy particle with a light particle only a small amount of momentum is transferred to the lighter body; hence such a light body cannot appreciably deflect an alpha particle.
- Q30** According to de Broglie, a particle such as an electron has a wavelength given by  $h/p$ , where  $p$  is the magnitude of the linear momentum. However, the magnitude of the wavelength is not a fundamental constant.