Solutions

Each answer shows the steps, then the **result**.

2.1

- substrate enters the active site
- enzyme–substrate complex forms
- reaction occurs
- products leave

2.2

- the active site changes shape as the substrate binds, which matches experimental evidence

3.1 C

- Lowering activation energy speeds the reaction; it does not change the amount of product or energy released, and the enzyme is not used up

3.2 B

- The active site is complementary in shape to only one substrate

3.3

(a)

- $\dfrac{12\ \text{cm}^3}{30\ \text{s}} = 0.40\ \text{cm}^3\,\text{s}^{-1}$

(b)

- substrate (hydrogen peroxide) has been used up / its concentration is lower, so fewer enzyme–substrate complexes form per second

(c)

- at the start the substrate concentration is highest, so the rate is at its true maximum and not yet slowed by substrate running out; this makes comparisons fair

3.4

- prepare a colour series / calibrate with known starch concentrations using the iodine test; take samples over time and measure the absorbance/colour in the colorimeter; the blue-black colour fades as starch is digested, so absorbance falls — plot against time