## Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

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

**2.1**

- breaking **large, insoluble** molecules
- into **small, soluble** molecules (by enzymes)

**2.2**

- large molecules are **too big** / insoluble to cross the gut wall
- small molecules can be **absorbed** into the blood

**2.3**

- amylase: **maltose**
- protease: **amino acids**
- lipase: **fatty acids and glycerol**

**2.4**

- **kills microbes** / bacteria in food
- gives the **low pH** (optimum) for pepsin

**2.5**

- on the membranes of the cells **lining the small intestine**

**2.6**

- bile is **alkaline** and **neutralises** the stomach acid
- giving the **optimum pH** for the enzymes in the small intestine

**3.1**

**D**

**3.2**

**A**

**3.3**

(a) **pH 7**

(b) $\frac{1}{2.0} = \mathbf{0.5\ per\ min}$

(c)

- the low pH **denatures** the amylase / changes the shape of its **active site**
- starch no longer **fits** the active site

(d)

- the stomach is **acidic** (about pH 2)
- amylase does not work at low pH: at pH 4 nothing was digested

(e) any two: **temperature**; volume / concentration of starch; volume / concentration of amylase

(f)

- heat a sample with **Benedict's solution** in a water bath
- it turns **brick red** (orange)

(g) iodine stays **orange-brown**: no starch is left