Solutions

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

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

2.1

the artery has a much thicker media (muscle coat)

the artery has a small round lumen; the vein has a wide, often flattened lumen (and valves)

2.2

type I: thin cells for gas exchange

type II: make surfactant

2.3

Brunner glands: **duodenum**

Peyer patches: **ileum**

crypts, no villi: **colon**

2.4

A **mucosa**

B **submucosa**

C **muscularis externa**, D **serosa** (or adventitia)

3.1

(a) thickness $\times$ 4, so rate $\times \frac{1}{4}$

(b) $\times \frac{1}{2}$

(c) CO_2 is about 20 times more soluble, so it still crosses fast enough

(d) blood flows faster through the capillaries, so it spends less time there; with a thick wall there is not enough time for O_2 to cross

3.2

(a) **type II** cells; they do not yet make enough **surfactant**

(b) without surfactant, surface tension T is high; a small r gives a high pressure, so small alveoli empty into large ones and collapse

(c) steroid injections, which speed up surfactant production

3.3

(a) hydrochloric acid and intrinsic factor

(b) B12 can only be absorbed when bound to intrinsic factor, in the ileum; without parietal cells there is no intrinsic factor

exercises.lol exercises.com.cn

(c) NSAIDs block prostaglandins, which keep up the mucus and bicarbonate that protect the lining, so acid damages it

(d) a hole forms (perforation) and stomach contents leak into the peritoneal cavity, causing peritonitis