Solutions

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

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

2.1

A **simple squamous**

B **simple columnar**

C **stratified squamous, keratinised**

2.2

urothelium: bladder or ureter

pseudostratified ciliated: trachea or bronchi

2.3

tendon: **dense regular**

dermis: **dense irregular**

outer ear: **elastic cartilage**

2.4

squamous metaplasia

no cilia, so mucus is not cleared and infections are more likely (it may also lead to cancer)

3.1

(a) $3 \times 10 \times 20 =$ **600**

(b) $3 \times 20 = 60$; $60/600 = 10\%$ left, so **90%** lost

(c) much less surface to absorb food; unabsorbed food stays in the gut and draws water in

(d) the damage is worst there, where gluten first meets the gut, and an endoscope reaches it easily

3.2

(a) **Barrett oesophagus**, metaplasia from stratified squamous to columnar epithelium

(b) it can change further to dysplasia, and then to adenocarcinoma

(c) they make mucus that protects them from acid

3.3

(a) a thin sheet that the epithelium sits on, separating it from connective tissue; a cancer that crosses it is **invasive**

(b) epithelium has no blood vessels; the vessels are below the membrane, so cells must cross it to reach them

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(c) vitamin C is needed to make strong collagen; weak collagen fails in vessel walls and scars

(d) the aortic wall cannot spring back under each heartbeat, so it stretches and may widen or tear