

4.5 Organ histology: urinary, endocrine, reproductive and skin

Name: _____ Class: _____ Date: _____

Total: 24 marks

KEY WORDS nephron

Objective

Match nephron segments to their epithelial signatures and reason about endocrine and skin architecture.

1 Key knowledge and worked examples

■ Signatures

Proximal = cuboidal + brush border (~65% reabsorbed); loop = flat squamous; distal = cuboidal; collecting duct = tall columnar. Endocrine = cords on fenestrated capillaries; skin = keratinised stratified squamous, ~4-week turnover.

■ Worked example: naming a field

Capillary tuft in a capsule beside a fuzzy-bordered cuboidal tubule: glomerulus + proximal tubule = renal cortex ✓.

2 Practice

2.1 Which nephron segment reabsorbs ~65% of filtrate? [3]

2.2 Why do endocrine cells sit on fenestrated capillaries? [3]

2.3 What is the epidermal turnover time? [3]

3 Exam-style questions

3.1 For each nephron segment, state the epithelium and its functional reason.

Glomerulus, proximal, loop, distal, collecting duct – five segments, five signatures ✓. [8]

3.2 A burn heals poorly (fictional case).

Explain why basement-membrane survival decides regeneration (the re-seeding template). Contrast partial- and full-thickness injury in one sentence each. State the immediate risks in the first 48 hours. [7]

Solutions

2.1

- The proximal tubule.

2.2

- No ducts: secretion goes straight into blood – shortest path.

2.3

- About four weeks.

3.1

- Glomerulus: fenestrated capillary tuft (filtration).
- Proximal: cuboidal + brush border (reabsorption area).
- Loop: flat squamous (passive exchange).
- Distal: cuboidal, no brush (fine-tuning).
- Collecting duct: tall columnar (controlled conveyance).
- Consistent epithelium-function pairing.

3.2

- Keratinocytes re-seed from the basement membrane: no membrane, no resurfacing.
- Partial thickness: membrane intact → heals from remaining appendages; full thickness: membrane destroyed → needs grafting.
- First 48 h: fluid loss and infection – the barrier is gone.