Urinary System
Kidney

Darkerly stained cortex; Lightly stained medulla
Renal Corpuscle

Made up of Bowman’s capsule and glomerulus

Parietal layer of Bowman’s capsule is lined by simple squamous epithelium.

Visceral layer by podocytes
Renal Corpuscle
Macula densa (Columnar Cells) present in DCT that comes in contact with the afferent arteriole.
BC - Bowman’s capsule (parietal layer)  Pod - podocyte (visceral layer of Bowman’s capsule)
MD - macula densa  JG - juxtaglomerular cells  DC - distal convoluted tubule
Renal Cortex

**PCT**
- Lined by cuboidal epithelium with brush border
- Cells are bigger
- Presence of brush border (microvilli) makes the lumen small.
- More eosinophilic than DCT

**DCT**
- Lined by cuboidal epithelium without brush border.
- Cells are smaller
- Absence of microvilli makes the lumen appear larger.
- Less eosinophilic than PCT
PCT

LOOP of HENLE

DCT

COLLECTING DUCT
CT - collecting tubules of renal medulla
TL - thin limb (of loop of Henle)
A - thick ascending (distal) tubule
Kidney Medulla
Kidney Medulla
Kidney Medulla
Renal medulla- Loop of Henle, Papillary Ducts & Vasa Recta
Is a thick muscular Tube which conveys the urine from the kidney to the Bladder by the contractions of the thick smooth muscle layer present in it.

Three Coats:
- Mucosa
- Muscle coat
- Adventitia
Ureter

Undistended Lumen shows numerous longitudinal mucosal folds formed by muscular contractions – giving it a star shaped appearance. Folds disappear when lumen is distended.
Ureter
Ureter

- **Mucosa**
  - Transitional Epithelium
  - Lamina Propria (Rich in elastic fibres)
- **Smooth Muscle coat:**
  - In upper 2/3
- **Inner-Longitud**
- **Outer-circular**
  - In Lower 1/3
- **Additional outer-longitud**
Ureter
Transitional epithelium of ureter

Several Layers

Outer - Large cuboidal cells

Intermediate - Polyhedral

Basal cells - low cuboidal or columnar
Ureter

- Reflux of urine from the urinary bladder is prevented by the oblique path followed by the terminal part of the ureter, through the bladder wall.

- When the musculature of the bladder contracts this part of the ureter is compressed- this mechanism constitutes a physiological sphincter.
Urinary Bladder

3 coats

• Mucosa-folds
  Transitional epithelium
  Lamina Propria

• Muscle coat
• Adventitia/Serosa
Urinary Bladder

- Thick muscle wall
- Arrangement of the smooth muscle fibres is similar to the lower end of ureter.
- Loosely arranged smooth muscle bundles, anastamosing with each other found in interstitial connective tissue which consists of elastic fibres in the deeper layers
- Distinct muscle layer are difficult to distinguish.
muscular wall

lumen

transitional epithelium

muscular wall, with smooth muscle and collagen

lamina propria

transitional epithelium
Mucosa of an empty bladder shows numerous mucosal folds that disappear during bladder distention.
Plasma Membrane of the superficial cells form an osmotic barrier between the toxic urine and the tissue fluids.

Dome shaped superficial cells. Some may be binucleated.
Urinary Bladder - Relaxed
Urinary Bladder - Stretched
Female Urethra
Female Urethra

- Mucosa thrown into folds.
- Stratified Squamous epithelium
- EXCEPT near the bladder where it is lined by transitional epithelium
- Many urethral glands homologous to prostate open into it
Female Urethra

- Deeper to mucosa, thin layer of spongy erectile tissue is present.
- This is surrounded by smooth muscle fibres arranged into inner-longitudinal, outer-circular
Female Urethra
MCQ

Cortex of kidney contains the following structures except

1. PCT
2. DCT
3. Renal corpuscle
4. Thin segment of loop of Henle
MCQ

Macula densa is present in
1. PCT
2. DCT
3. Afferent arteriole
4. Efferent arteriole
MCQ

PCT can be identified in histological section by the presence of

1. Acidophilic cytoplasm of the lining cuboidal cells
2. Basophilic cytoplasm of the lining cuboidal cells
3. Pale staining cytoplasm
4. Large lumen
MCQ

- Polyploidy and binucleated cells are commonly seen in
  1. Simple cuboidal epithelium
  2. Stratified squamous epithelium
  3. Pseudostratified columnar epithelium
  4. Transitional epithelium
MCQ

Loop of Henle is lined by

1. Simple squamous epithelium
2. Simple cuboidal epithelium
3. Simple columnar epithelium
4. Simple cuboidal with brush border