FLASH CARDS

CLASS : Class 11th **SUBJECT : Zoology**

CHAPTER: Excretory Products and Their Elimination

Terminology	Description
Excretion	Removal of metabolic waste products from the body.
Nitrogenous Wastes	Ammonia, urea, and uric acid. Ammonotelic: Excrete ammonia (e.g., many aquatic animals). Ureotelic: Excrete urea (e.g., mammals, amphibians). Uricotelic: Excrete uric acid (e.g., birds, reptiles). Ammonia: Highly toxic; requires more water. Urea: Less toxic; formed in the liver (urea cycle). Uric Acid: Least toxic; semi-solid paste; conserves water.
Human Excretory System	A system that removes nitrogenous wastes and maintains homeostasis. Consists of the kidneys, ureters, urinary bladder, urethra, renal artery, and renal vein.
Structure of the Kidney	Cortex: Outer region of the kidney. Medulla: Inner region containing renal pyramids. Renal Pelvis: Funnel-shaped cavity collecting urine. Hilum: Entry and exit point for vessels & ureter.
Nephron	Basic filtration unit of the kidney (~1 million/kidney). Nephron consists of Bowman's capsule, the glomerulus, PCT (Proximal Convoluted Tubule), Loop of Henle, DCT (Distal Convoluted Tubule), Collecting Duct, and Juxtaglomerular Apparatus (JGA).
Mechanism of Urine Formation	Occurs in three steps: Glomerular filtration, selective reabsorption, and tubular secretion. Glomerular Filtration: Ultrafiltration of blood in the glomerulus. Tubular Reabsorption Selective reabsorption of useful substances takes place in PCT. Tubular Secretion: Addition of ions/wastes into filtrate.

Proximal Convoluted Tubule (PCT)	The Proximal Convoluted Tubule (PCT) is lined with simple cuboidal brush border epithelium that increases surface area for efficient reabsorption. It reabsorbs nearly all essential nutrients and about 70–80% of water and electrolytes from the filtrate.
Loop of Henle	Henle's loop has minimal overall reabsorption but is essential for maintaining high osmolarity of the medullary interstitial fluid. The descending limb is permeable to water but not to electrolytes, so the filtrate becomes concentrated. The ascending limb is impermeable to water but allows electrolyte transport, which dilutes the filtrate as it moves upward.
Distal Convoluted Tubule (DCT)	The Distal Convoluted Tubule (DCT) carries out conditional reabsorption of sodium (Na^+) and water. It also reabsorbs bicarbonate (HCO_3^-). Additionally, it secretes hydrogen, potassium, and ammonia (NH_3) to maintain blood pH and sodium–potassium balance.
Collecting Duct	The Collecting Duct extends from the kidney cortex to the inner medulla. It reabsorbs large amounts of water to produce concentrated urine and allows small amounts of urea to maintain medullary osmolarity. It also helps regulate blood pH and ionic balance by selectively secreting H^+ and K^+ ions.
GFR	Glomerular Filtration Rate (~125 mL/min). Counter Current Mechanism: Maintains medullary osmotic gradient.
Concentration of Urine	ADH (Vasopressin): Increases water reabsorption. Osmoregulation: Maintenance of water & salt balance. Vasa Recta: Capillaries maintaining gradient.
Regulation of Kidney Function	Renin-Angiotensin Mechanism: Regulates blood pressure & GFR. Aldosterone: Increases sodium reabsorption. Atrial Natriuretic Factor (ANF): Reduces blood pressure.
Micturition	The process of release of urine is called micturition, and the neural mechanisms causing it are called the micturition reflex. The urine formed is a light yellow coloured watery fluid which is slightly acidic (pH-6.0) and has a characteristic odour.

	For example, the presence of glucose (Glycosuria) and ketone bodies (Ketonuria) in urine is indicative of diabetes mellitus.
Other Organs in Excretion	Lungs: Remove CO_2 and water vapour. Skin: Excretes sweat (water, salts, urea). Liver: Converts ammonia into urea. Intestine: Excretes bile pigments.
Disorders of the Excretory System	Uremia: High urea level in the blood. Renal Failure: Inability of the kidneys to function properly. Hemodialysis: Artificial blood purification. Renal calculi: Stone or insoluble mass of crystallised salts (oxalates, etc.) formed within the kidney. Glomerulonephritis: Inflammation of the glomeruli of the kidney.



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