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Matric number: 18/mhs07/025

Title: Renal Physiology

Course Title: Renal Physiology, B/ody fluid & Temperature Regulation and Autonomic Nervous System

Course Code: PHS 212

Question

Explain urine formation and concentration

This is the process where urine is formed through the following processes carried out in three phases namely;

1. Glomerular filtration,
2. Reabsorption
3. Secretion.

Glomerular Filtration
Glomerular filtration occurs in the glomerulus where blood is filtered. This process occurs across the three layers- epithelium of Bowman's capsule, endothelium of glomerular blood vessels, and a membrane between these two layers. Blood is filtered in such a way that all the constituents of the plasma reach the Bowman's capsule, except proteins. This process is known as ultrafiltration.
Reabsorption
This is achieved by active and passive transport. Molecules and ion are reabsorbed into the circulatory system. The fluid passes through the components of the nephron as water and ions are removed as ion concentration) changes. In the collecting duct, secretion occurs before the fluid leaves the ureter in the form of urine.
Secretion
The next step in urine formation is the tubular secretion. Here, tubular cells secrete substances like hydrogen ion, potassium ion, etc into the filtrate. By this process, the ionic, acid-base and the balance of other body fluids are maintained. The secreted ions combine with the filtrate and form urine. The urine passes out of the nephron tubule into a collecting duct.