
CBSE TEST PAPER-02
CLASS - XI BIOLOGY
(Excretory Products and their elimination)

General Instruction:

- All questions are compulsory.
 - Question No. 1 to 3 carry one marks each. Question No. 4 to 6 carry two marks each. Question No. 7 and 8 carry three marks each. Question No. 9 carry five marks.
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1. Name the three kinds of nitrogen excretion.

2. What are podocytes?

3. Besides water, name any two constituents of human sweat.

4. Kidneys do not play a major role in excretion in ammonotelic animals Justify.

5. Define glomerular filtration rate. What is its value in a healthy human?

6. What is the significance of frog's tadpole being ammonotelic and the adult frog being ureotelic?

7. Describe urea cycle.

8. What is a dialysis machine? When is it needed?

9. Describe the mechanism of urine formation.

CBSE TEST PAPER-2
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[ANSWERS]

Ans 01. (a) Ammonotelism (b) Ureotelism (c) Uricotelism

Ans 02. Epithelial cells of Bowman's capsule are called podocytes.

Ans 03. Sodium chloride and urea.

Ans 04. Kidneys do not play any significant role in elimination of ammonia –

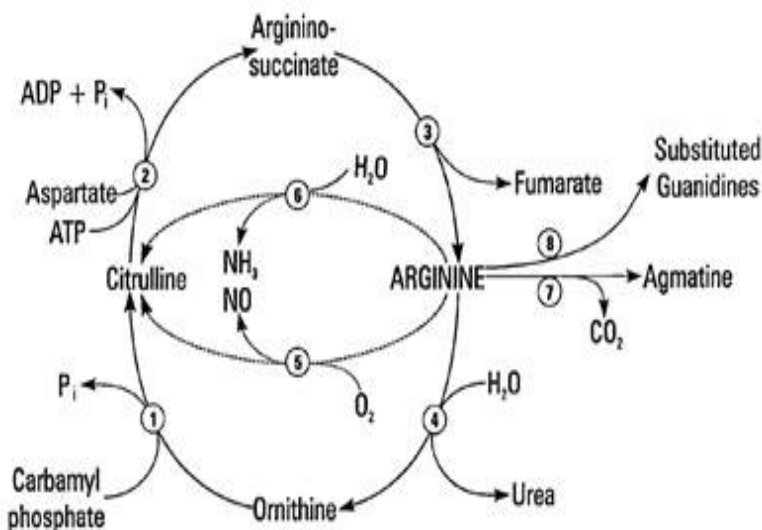
(i) Ammonia is readily soluble in water and diffuses across the body surfaces.

(ii) Ammonia is excreted as ammonium ions through gill surface.

Ans 05. The amount of filtrate formed by kidneys per minute is known as Glomerular filtration rate. (GFR). In a healthy individual, GFR is approx. 125ml / minute i.e. 180 liters per day.

Ans 06. Tadpole is ammonotelic, because excretion of ammonia requires a large volume of water, which the tadpole has in its surrounding. An adult frog is ureotelic because elimination of urea requires a moderate volume of water that is much less compared to ammonia.

Ans 07. It is called kreb's Ornithine cycle.



Ans 08. Dialysis machine is also known as artificial kidney. It filters blood when the kidneys fail. In dialysis small solute molecules diffuse through a semi permeable membrane as a substitute for glomerulus. It has a cellophane membrane where the blood of a patient is made to flow on one side of the membrane and the surrounding fluid on other side. The wastes from the blood move into the surrounding fluid through cellophane membrane. It is needed when kidney fails to work and urine is not formed.

Ans 09. Urine formation involves three main processes –

(i) Glomerular filtration – A protein – free fluid is filtered from blood of glomerular capillaries into the lumen of Bowman's capsule.

The filtration occurs through three layers, which form the filtration membrane; they are : (i) Endothelium of glomerular capillaries (ii) Epithelium of Bowman's capsule. (iii) Basement membrane between the two layers.

The epithelial cells or podocytes of the Bowman's capsule are arranged in an intricate manner, to leave some filtration slits.

The blood is filtered so finely that the composition of filtrate is very similar to plasma except for the plasma proteins.

The glomerular filtrate rate is about (25ml / min)

(ii) Reabsorption -

Nearly 90% of the filtrate is reabsorbed in the renal tubule of the epithelial cells of the lining of renal tubule.

Certain substances like glucose, amino acids, Na^+ ions, K^+ ions and Ca^{2+} ions are reabsorbed actively.

Water is reabsorbed passively by osmosis.

Certain other substance like Cl^- ions are absorbed passively.

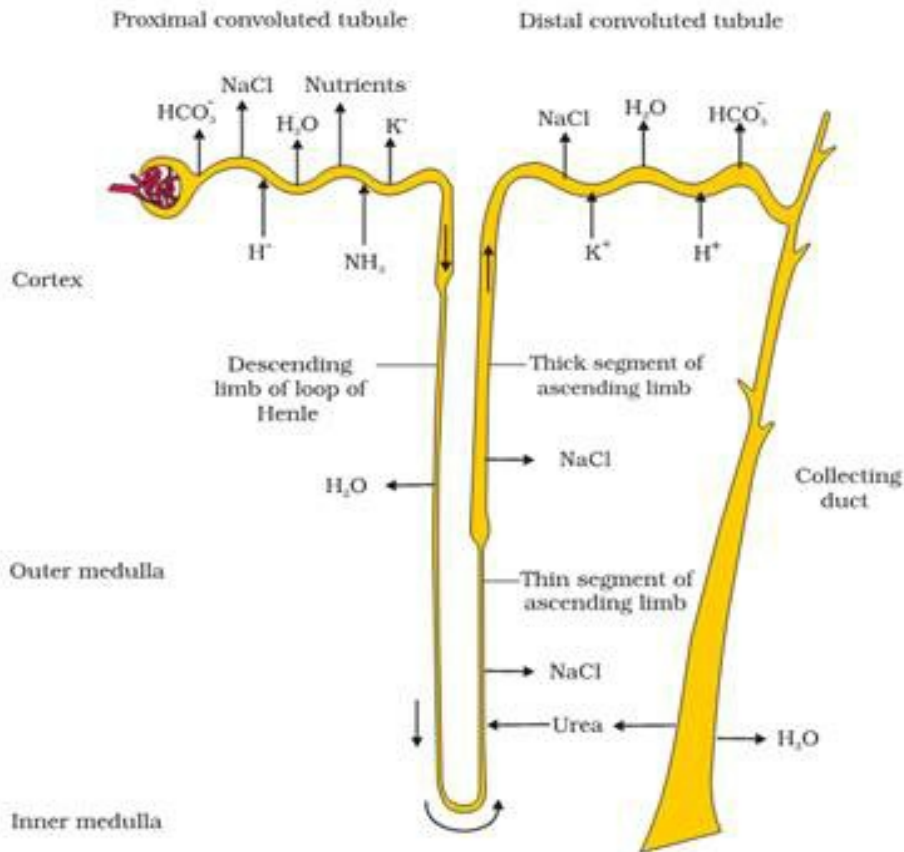


Figure 19.5 Reabsorption and secretion of major substances at different parts of the nephron (Arrows indicate direction of movement of materials.)

(iii) Tubular secretion –

It is the process by which certain substances / ions like K^+ and ammonia are directly secreted into the lumen of the nephron.

The step is important in urine formation, as it helps to maintain the ionic balance and PH of the body fluids.