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Excretory Products and their Elimination

BQ19Q190

Removal of proximal convoluted tubule from the nephron will result in **NEET - 2015**

- ✓ (A) More diluted urine
- (B) More concentrated urine
- (C) No change in quality and quantity of urine
- (D) No urine formation

BQ19S190

Ans [A]

The removal of proximal convoluted tubule (PCT) from the nephron results in lack of reabsorption of high threshold substances from renal tubules and obligatory reabsorption of water is also affected leading to more diluted urine.

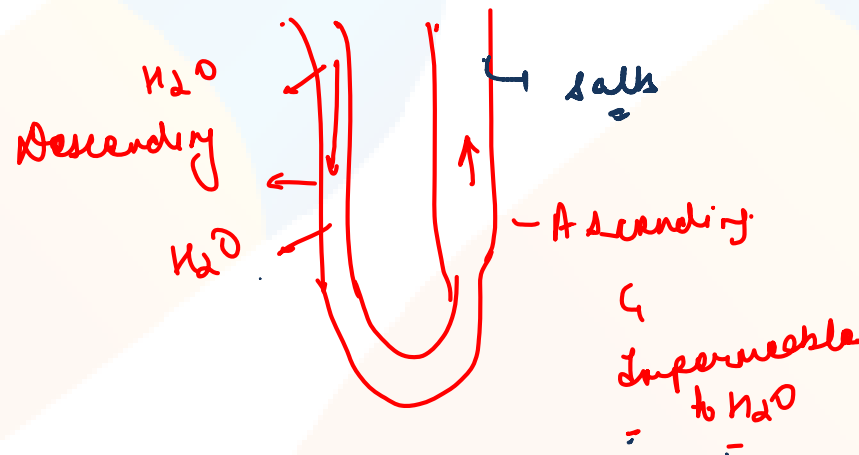
Since PCT is associated with reabsorption of much water by osmosis and glucose and amino acids by secondary active transport and other salts and ions as sodium and potassium by primary active transport.

BQ19Q191

Which of the following statements is correct?

NEET - 2017

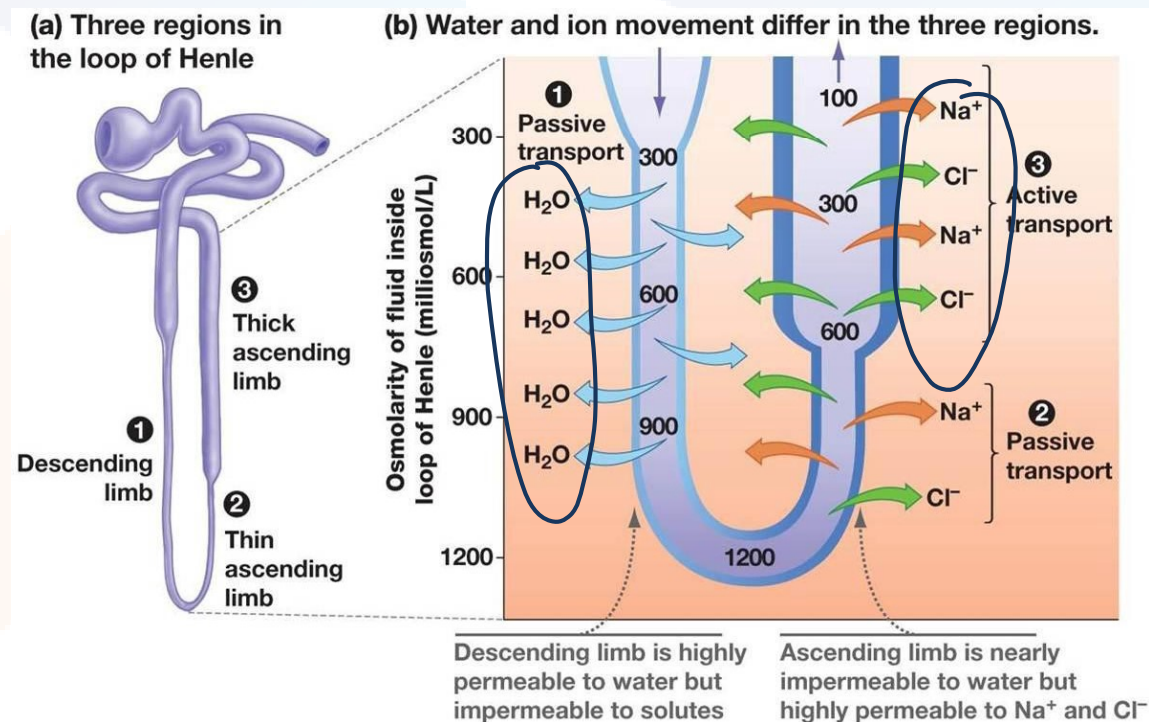
- (A) ✓ The ascending limb of loop of Henle is impermeable to water ✓
- (B) The descending limb of loop of Henle is impermeable to water ✗
- (C) The ascending limb of loop of Henle is permeable to water ✗
- (D) The descending limb of loop of Henle is permeable to electrolytes ✗



BQ19S191

Ans [A]

The ascending limb of loop of Henle is impermeable to water and permeable to K^+ , Cl^- and Na^+ and partially permeable to urea. Due to this, sodium, potassium, calcium, magnesium and chloride are reabsorbed here making the filtrate hypotonic.



BQ19Q192

A decrease in blood pressure/volume will not cause the release of **NEET - 2017**

(A) Renin ✗

(C) Aldosterone ✗

☒ (B) Atrial natriuretic factor

(D) ✗ ADH (Anti-Diuretic Hormone)

→ vasodilation → ↓ B.P

J₁ cells ← fall in blood flow / glomerular blood pressure

↓
Renin

Angiotensinogen

↑ glomerular blood pressure
↑ vasodilation

↓
Angiotensin I

↓
Angiotensin II

↳ ↑ adrenal cortex

Aldosterone

↑ B.P

osmoreceptors → + → Hypothalamus
↓
Post-Pituitary

↑
excessive loss of fluid from body

ADH

↓
reabsorp
of H₂O

BQ19S192

Ans [B]

A decrease in blood pressure volume stimulates the release of renin, aldosterone, and ADH while increase in blood volume stimulates the release of Atrial Natriuretic Factor (ANF). Atrial Natriuretic Factor (ANF) is produced during increased blood pressure/volume. It can cause vasodilation and there by, decrease the blood pressure.

BQ19Q193

The part of nephron involved in active reabsorption of sodium is

NEET - 2016

- (A) Distal convoluted tubule
- (B) Proximal convoluted tubule
- (C) Bowman's capsule
- (D) Descending limb of Henle's loop

BQ19S193

 **Ans [B]**

Proximal convoluted tubule is involved in active reabsorption of sodium. The majority (about 70%) of sodium is reabsorbed here, into the cytosol of the epithelial cells of the nephron.

BQ19Q194

Human urine is usually acidic because

NEET - 2015

- (A) The sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries
- (B) Excreted plasma proteins are 'acidic
- (C) Potassium and sodium exchange generates acidity
- ☒ (D) Hydrogen ions are actively secreted into the filtrate

↑ tubular secretion → acid-base balance
=

BQ19S194

Ans [D]

The proximal tubule is the portion of nephron of the kidney which leads from the Bowman's capsule to the loop of Henle. It regulates the pH of the filtrate by exchanging hydrogen ions in the interstitium for bicarbonate ions in the filtrate. Due to the H^+ ions the human urine is usually acidic.

BQ19Q196

Which of the following causes an increase in sodium reabsorption in distal convoluted tubule?

NEET - 2014

- ~~(A)~~ Increase in aldosterone levels
- (B) Increase in antidiuretic hormone levels
- (C) Decrease in aldosterone levels
- (D) Decrease in antidiuretic hormone levels

H_2O reabsorption

BQ19S196

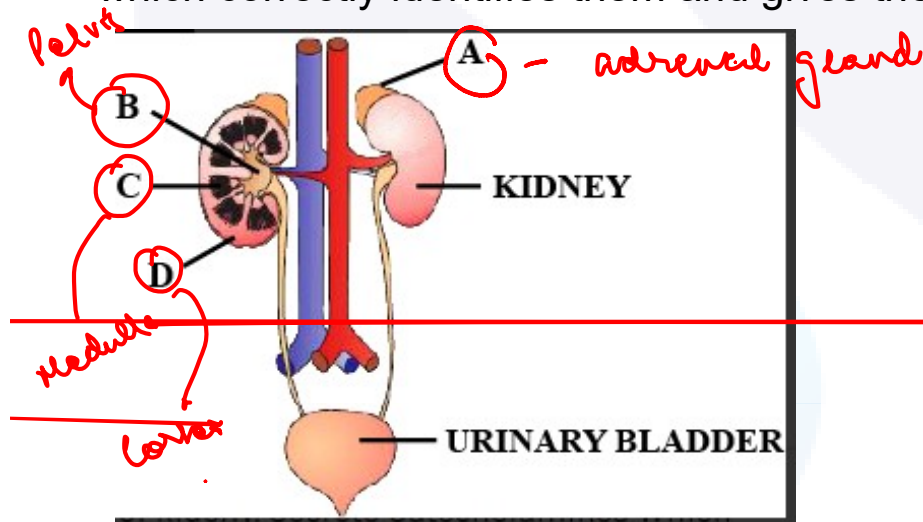
Ans [A]

Increase in aldosterone levels cause an increase in sodium reabsorption in DCT. It is secreted by outer, layer of adrenal gland when aldosterone is present in the blood, all the Na^+ in the filtrate is reabsorbed. Retaining Na^+ raises the osmotic pressure of the blood and reduces the water loss from the body.

BQ19Q197

Figure shows human urinary system with structures labelled A to D. Select option, which correctly identifies them and gives their characteristics and/of functions.

NEET - 2013

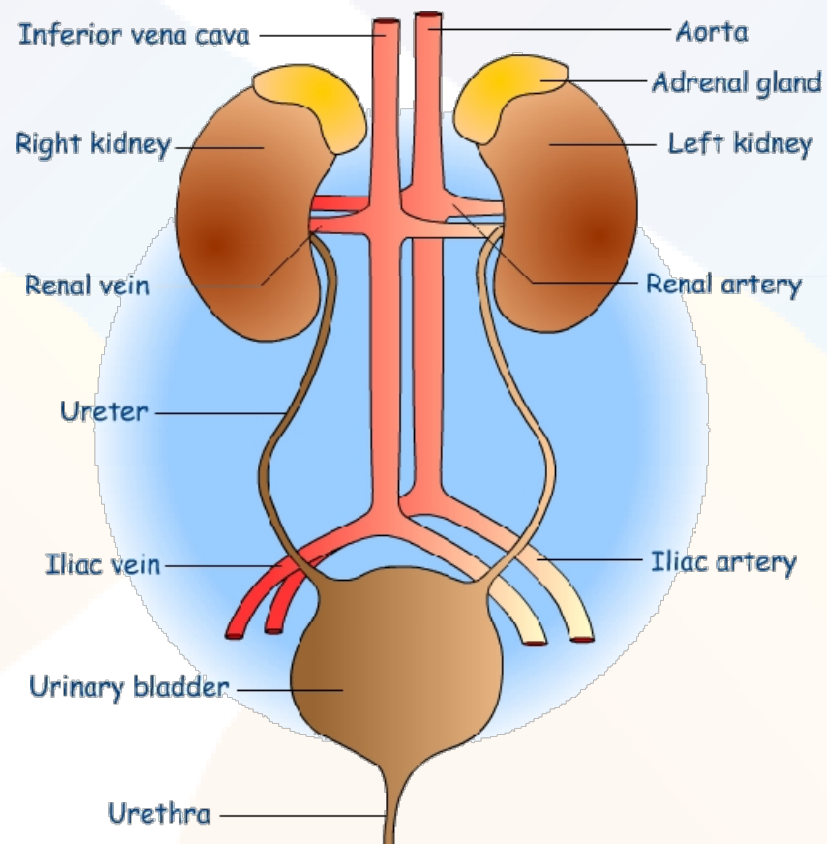


- (A) A-adrenal gland located at the anterior part of kidney. Secrete catecholamines, which stimulate glycogen breakdown
- (B) B-pelvis broad funnel shaped space inner to hilum, directly connected to loops of Henle
- (C) C-mediulla-inner zone of kidney and contains complete nephrons
- (D) D-cortex-outer part of kidney and do not contain any part of nephrons

BQ19S197

Ans [A]

A-Adrenal gland, B-Renal pelvis, C-Medulla, D-Cortex.



BQ19Q198

Which one of the following correctly explains the function of a specific part of a human nephron?

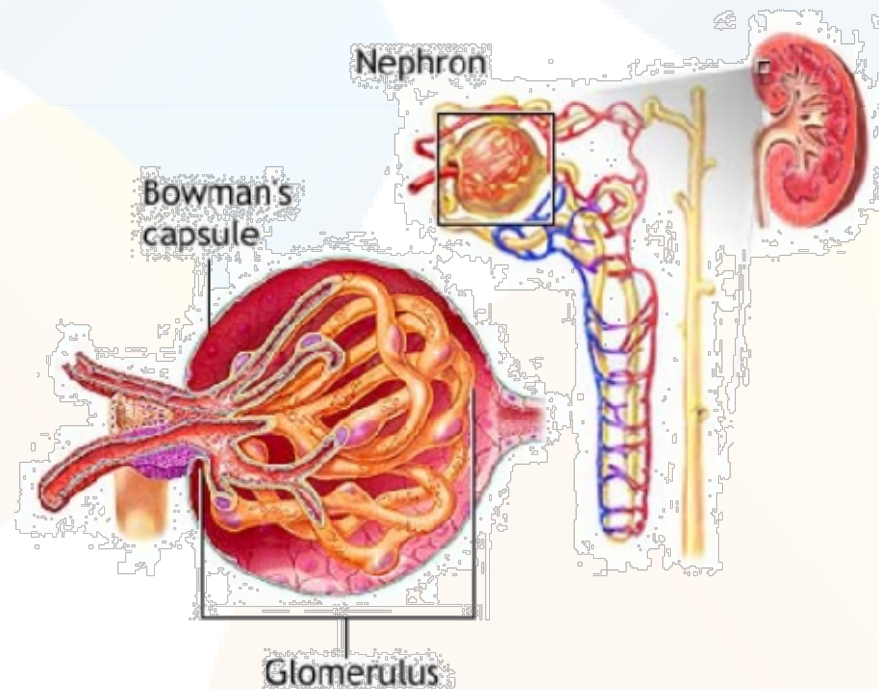
NEET - 2011

- (A) Henle's loop - most reabsorption of the major substances from the glomerular filtrate ✗
- (B) Distal convoluted tubule - reabsorption of ions into the surrounding blood capillaries ✗
- (C) Afferent arteriole - carries the blood away from the glomerulus towards renal vein ✗
- ☒ (D) Podocytes- create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule ✓

BQ19S198

~~Ans~~ [D]

Podocytes or visceral epithelial cells are the cells in Bowman's capsule in the kidneys that wrap around the capillaries of glomerules. They create minute pores (slit pores) for the filtration of blood into the Bowman's capsule.



BQ19Q199

Which one of the following is not a part of a renal pyramid?

NEET - 2011

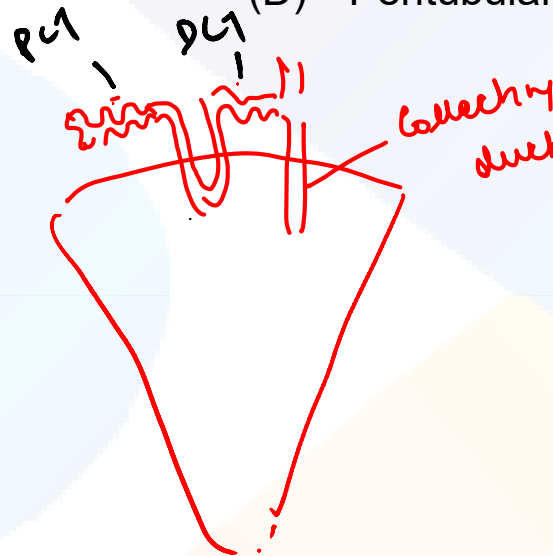
~~(A)~~ Convoluted tubules

(B) Collecting ducts ✕

(C) Loops Henle ↑

(D) Peritubular capillaries ✕

PCT and
DCT



BQ19S199

Ans [A]

Convolut ed tubule is the highly convoluted segments of nephron in the renal labyrinth of the kidney. It is made up of the proximal tubule leading from the Bowmans capsule to the descending limb of Henle's loop and the distal tubule leading from the ascending limb of Henle's loop to a collecting tubule.

Uricotelic mode of passing out nitrogenous wastes is found in

NEET - 2011

(A) Birds and annelids

(B) Amphibians and reptiles

(C) Insects and amphibians

☒ (D) Reptiles and birds

Ans [D]

Reptile, birds, land snails and insects excrete nitrogenous waste as uric acid in the form of pellet of paste with a minimum loss of water and are called uricotelic animals.

BQ19Q201

Which one of the following statements is correct with respect to kidney function regulation?

NEET - 2011

- (A) Exposure to cold temperature stimulates ADH release ✗
- (B) An increase in glomerular blood flow stimulates formation of angiotensin II ✗
- (C) During summer when body loses lot of water by evaporation, the release of ADH is suppressed ✗
- (D) When someone drinks lot of water ADH release is suppressed

ADH release is suppressed
↓
H₂O reabsorption

BQ19S201

Ans [D]

When someone drinks lot of water which is not required by body, the osmolality of the blood will decrease. The decrease in osmolality will inhibit the release of ADH.

BQ19Q202

Which one of the following statements in regard to excretion by the human kidneys is correct?

NEET - 2010

- (A) Descending limb of loop of Henle is impermeable to water \times
- (B) Distal convoluted tubule is incapable of reabsorbing HCO_3^- \times
- (C) Nearly 99 per cent of the glomerular filtrate is reabsorbed by the renal tubules
- (D) Ascending limb of loop of Henle is impermeable to electrolytes \times



180 litres / day
1.5 litres
=



Ans [C]

The plasma fluid that filters out from glomerular capillaries into Bowman's capsule of nephron is called glomerular filtrate. A comparison of the volume of the filtrate formed per day (180 L/day) with that nearly 99 percent of filtrate has to be reabsorbed by the renal tubules. This process is called reabsorption.

BQ19Q203

→ urea

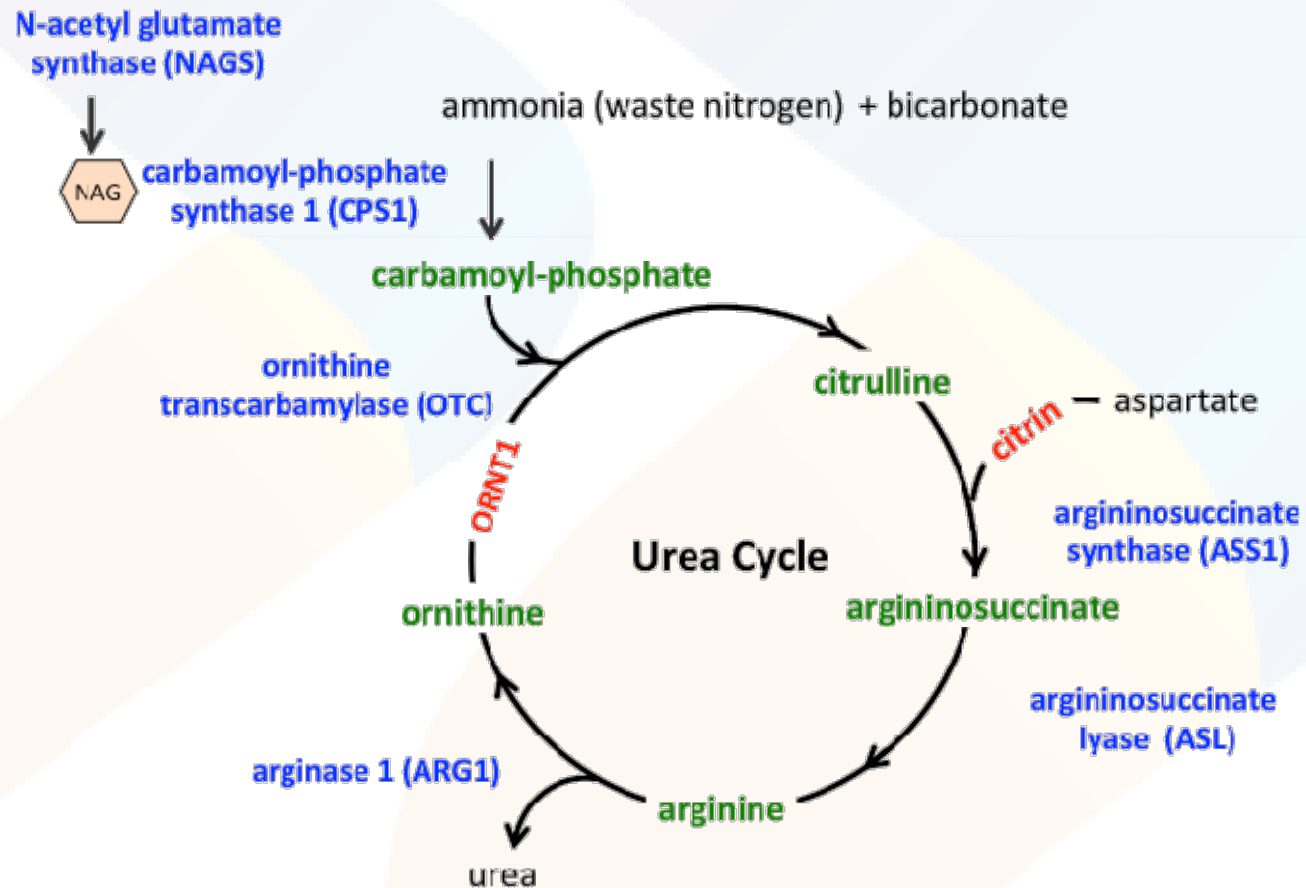
The principal nitrogenous excretory compound in humans is synthesised. **NEET - 2010**

- (A) In kidneys but eliminated mostly through liver
- (B) In kidneys as well as eliminated by kidneys
- (C) In liver and also eliminated by the same through bile
- ☒ (D) In the liver, but eliminated mostly through kidneys

↳ urea cycle / ornithine cycle

Ans [D]

In humans, the principal nitrogenous excretory compound (i.e., urea) is synthesized in liver by ornithine cycle.



BQ19Q204

Uric acid is the chief nitrogenous component of the excretory products of **NEET - 2009**

(A) Man

(B) Earthworm

(C) Cockroach

(D) Frog

BQ19S204

Ans [C]

Cockroach excretes uric acid as the chief nitrogenous excretory product.

Man excretes urea as the chief nitrogenous excretory product.

Earthworm excretes 40% urea, 20% ammonia and 40% amino acids.

Frog excretes urea as the chief nitrogenous product.

BQ19Q205

What will happen if the stretch receptors of the urinary bladder wall are totally removed? = **NEET - 2009**

- (A) There will be no micturition
- (B) Micturition will continue
- (C) Urine will continue to collect in the bladder
- ☒ (D) Both a and c

Ans [D]

The stretch receptors basically function by sending signal to the brain when the urinary bladder is filled to its maximum capacity. After receiving the signal it relaxes the bladder so that the urine passes out. In case the stretch receptors are removed or damaged, urine will continue to get collected in the bladder and they would not be able to send the apt signal and hence would remain closed leading to no micturition.

Q. next

BQ19Q206

A person who is on a long hunger strike and is surviving only on water, will have:

NEET - 2007

- (A) More sodium in his urine
- (B) Less amino acids in his urine
- (C) More glucose in his blood
- (D) Less urea in his urine

BQ19S206

Ans [D]

Due to a long hunger strike and survival on water, a person will have less urea in his urine because urea comes to kidney as a waste product from liver which is formed after the breakdown of protein fat, carbohydrate during hunger. It is not synthesized but the synthesized ones are catabolized.

BQ19Q207

Angiotensinogen is a protein produced and secreted by:

NEET - 2006

- (A) Macula densa cells
- (B) Endothelial cells (cells lining the blood vessels)
- ☒ (C) Liver cells
- (D) Juxtaglomerular (JG) cells

BQ19S207

Ans [C]

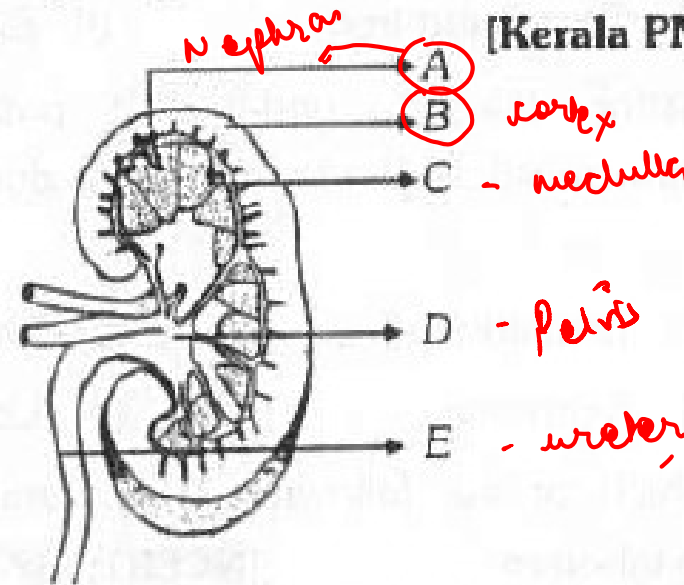
Angiotensinogen is a plasma protein produced and secreted by the liver cells. Renin secreted from juxtaglomerular cells and acts enzymatically on angiotensinogen to release 10 amino acid peptide angiotensin I.

Which one of the following characteristics is common both in humans and adult frogs

[NCERT; CBSE PMT (Mains) 2012]

- (a) Four-chambered heart
- (b) Internal fertilisation
- (c) Nucleated RBCs
- ☒ (d) Ureotelic mode of excretion

Refer the following diagram and identify the parts of a kidney indicated [Kerala PMT 2006]



- (a) A=cortex, B=nephron, C=pelvis, D=medulla, E=ureter
- (b) A=cortex, B=medulla, C=nephron, D=pelvis, E=ureter
- (c) A=nephron, B=cortex, C=medulla, D=ureter, E=pelvis
- ☒ (d) A=nephron, B=cortex, C=medulla, D=pelvis, E=ureter
- (e) A=nephron, B=ureter, C=pelvis, D=medulla, E=cortex

Correct order of excretory organs in Cockroach, Earthworm and Rabbit respectively

[AFMC 2000;
RPMT 2001; BVP 2001; AIIMS 2002;
Bihar CECE 2006; Kerala PMT 2007]

- (a) Skin, malpighi tubules, kidney ✗
- ~~(b)~~ Malpighi tubules, nephridia, kidney ✗
- (c) Nephridia, malpighi tubule, kidney ✗
- (d) Nephridia, kidney, green gland ✗

→ Malpighian tubules

The basic functional and structural unit of human kidney is

**[NCERT; DPMT 1993; MP PMT 1995, 2012;
CBSE PMT 1997; BHU 1999; RPMT 1999, 2005;
AFMC 2001; CPMT 2002; J & K CET 2005;
Bihar CECE 2006; Odisha JEE 2012]**

Or

Loop of Henle is found in

[CPMT 2001; MP PMT 2010; AMU (Med.) 2012]

- | | |
|---------------|------------------|
| (a) Nephron | (b) Pyramid |
| (c) Nephridia | (d) Henle's loop |

Match the entries in column I with those in column II and choose the correct answer from the following

Column I

- A. Uremia
- B. Hematuria
- C. Ketonuria
- D. Glycosuria
- E. Proteinuria

Column II

- 1. Excess of protein level in urine
- 2. Presence of high ketone bodies in urine
- 3. Presence of blood cells in urine
- 4. Presence of glucose in urine
- 5. Presence of urea in urine

[NCERT; Kerala PMT 2006, 11;
DPMT 2007; CPMT 2010]

- (a) A - 5, B - 3, C - 2, D - 4, E - 1
- (b) A - 4, B - 5, C - 3, D - 2, E - 1
- (c) A - 5, B - 3, C - 4, D - 2, E - 1
- (d) A - 3, B - 5, C - 2, D - 1, E - 4
- (e) A - 2, B - 1, C - 3, D - 4, E - 5

A.A, Na⁺

Reabsorption of glucose from the glomerular filtrate in the kidney tubule is carried out by -

Or

Reabsorption in the tubules of nephrons occurs by the process of [AIIMS 2001; AIEEE Pharmacy 2003]

- ✓ (a) Active transport (b) Osmosis
(c) Brownian movement (d) Diffusion

Maintenance of body potassium level is primarily by tubular
[AMU (Med.) 2010]

- (a) Absorption in PCT
- ☒ (b) Secretion in DCT and /or cortical collecting duct
- (c) Absorption in DCT
- (d) Secretion in PCT

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- ☒ (a) Active transport
- (b) Osmosis
- (c) Brownian movement
- (d) Diffusion

Which one of the following pair of waste substances is removed from blood in ornithine cycle

[CBSE PMT 1996, 2005; AFMC 2000; BHU 2001]

(a) CO_2 and urea

(b) Ammonia and urea

☒ (c) CO_2 and ammonia

(d) Urea and sodium salt

Match the excretory functions of section I with the parts of the excretory system in section II. Choose the correct combinations from among the answers given

	Section I		Section II
(i)	Ultrafiltration	(a)	Henle's loop
(ii)	Concentration of urine	(b)	Ureter
(iii)	Transport of urine	(c)	Urinary bladder
(iv)	Storage of urine	(d)	Malpighian corpuscles
		(e)	Proximal convoluted tubules

[Kerala CET 2005]

(a) (i) - (d), (ii) - (a), (iii) - (b), (iv) - (c)

(b) (i) - (d), (ii) - (c), (iii) - (b), (iv) - (a) ✗

(c) (i) - (e), (ii) - (d), (iii) - (a), (iv) - (c) ✗

(d) (i) - (e), (ii) - (d), (iii) - (a), (iv) - (b) ✗

(e) (i) - (d), (ii) - (a), (iii) - (c), (iv) - (b) ✓