

Excretory Products and Their Elimination — NEET Biology PYQ (2005-2020)

Class 11 Biology · 32 real NEET & AIPMT questions, year-tagged · answers checked by RankUp

NEET 2020 · Q49

1. Presence of which of the following conditions in urine are indicative of Diabetes Mellitus?

- (A) Uremia and Ketonuria
- (B) Uremia and Renal Calculi
- (C) Ketonuria and Glycosuria
- (D) Renal calculi and Hyperglycaemia

NEET 2020 · Q68

2. Which of the following would help in prevention of diuresis?

- (A) More water reabsorption due to undersecretion of ADH
- (B) Reabsorption of Na^+ and water from renal tubules due to aldosterone
- (C) Atrial natriuretic factor causes vasoconstriction
- (D) Decrease in secretion of renin by JG cells

NEET 2019 · Q132

3. Which of the following factors is responsible for the formation of concentrated urine ?

- (A) Low levels of antidiuretic hormone.
- (B) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.
- (C) Secretion of erythropoietin by Juxtaglomerular complex.
- (D) Hydrostatic pressure during glomerular filtration.

NEET 2019 · Q163

4. Use of an artificial kidney during hemodialysis may result in :

- (a) Nitrogenous waste build-up in the body**
- (b) Non-elimination of excess potassium ions**
- (c) Reduced absorption of calcium ions from gastro-intestinal tract**
- (d) Reduced RBC production**

Which of the following options is the most appropriate ?

- (A) (a) and (b) are correct
- (B) (b) and (c) are correct
- (C) (c) and (d) are correct
- (D) (a) and (d) are correct

NEET 2018 · Q163

5. Match the items given in Column I with those in Column II and select the correct option given below:

Column I: a. Glycosuria, b. Gout, c. Renal calculi, d. Glomerular nephritis

Column II: i. Accumulation of uric acid in joints, ii. Mass of crystallised salts within the kidney, iii. Inflammation in glomeruli, iv. Presence of glucose in urine

- (A) a-ii, b-iii, c-i, d-iv
- (B) a-i, b-ii, c-iii, d-iv
- (C) a-iii, b-ii, c-iv, d-i
- (D) a-iv, b-i, c-ii, d-iii

NEET 2018 · Q164

6. Match the items given in Column I with those in Column II and select the correct option given below:

Column I (Function): a. Ultrafiltration, b. Concentration of urine, c. Transport of urine, d. Storage of urine

Column II (Part of Excretory System): i. Henle's loop, ii. Ureter, iii. Urinary bladder, iv. Malpighian corpuscle, v. Proximal convoluted tubule

- (A) a-v, b-iv, c-i, d-ii
- (B) a-iv, b-i, c-ii, d-iii
- (C) a-iv, b-v, c-ii, d-iii
- (D) a-v, b-iv, c-i, d-iii

NEET 2017 · Q57

7. A decrease in blood pressure/volume will not cause the release of:

- (A) Renin
- (B) Atrial Natriuretic Factor
- (C) Aldosterone
- (D) ADH

NEET 2017 · Q61

8. Which of the following statements is correct?

- (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.

NEET 2017 (Gujarati paper) · Q55

9. A large amount of about 180 L of fluid is filtered by the human kidneys per day. Which one of the following renal corpuscle features does not justify this?

- (A) The glomerular capillaries have a large surface area.
- (B) The glomerular capillaries are fenestrated and hence leakier than other capillaries.
- (C) The glomerular capillaries have a higher blood pressure than the other capillaries of the body.
- (D) The efferent arteriole is wider than the afferent arteriole causing easier outflow of blood from the glomerulus.

NEET 2017 (Gujarati paper) · Q124

10. Which of the following statements is not true?

- (A) Descending limb of loop of Henle is impermeable to solutes.
- (B) Distal convoluted tubule functions in K^+ , Na^+ homeostasis
- (C) Descending limb of loop of Henle is impermeable to water.
- (D) Loop of Henle is largely responsible for concentrated urine

NEET 2016 Phase 1 · Q167

11. In mammals, which blood vessel would normally carry largest amount of urea?

- (A) Renal Vein
- (B) Dorsal Aorta
- (C) Hepatic Vein
- (D) Hepatic Portal Vein

AIPMT 2015

12. Which of the following does not favour the formation of large quantities of dilute urine?

- (A) Atrial-natriuretic factor
- (B) Alcohol
- (C) Caffeine
- (D) Renin

AIPMT 2014

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

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

AIPMT 2012 Mains

14. Which one of the following options gives the correct categorisation of six animals according to the type of nitrogenous wastes (A - Ammonotelic, B - Ureotelic, C - Uricotelic) they give out?

- (A) A: Pigeon, Humans; B: Aquatic Amphibia, Lizards; C: Cockroach, Frog
- (B) A: Frog, Lizards; B: Aquatic Amphibia, Humans; C: Cockroach, Pigeon
- (C) A: Aquatic Amphibia; B: Frog, Humans; C: Pigeon, Lizards, Cockroach
- (D) A: Aquatic Amphibia; B: Cockroach, Humans; C: Frog, Pigeon, Lizards

AIPMT 2012 Mains

15. A fall in glomerular filtration rate (GFR) activates

- (A) juxta glomerular cells to release renin
- (B) adrenal cortex to release aldosterone
- (C) adrenal medulla to release adrenaline
- (D) posterior pituitary to release vasopressin

AIPMT 2012 Mains

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

- (A) Four - chambered heart
- (B) Internal fertilisation
- (C) Nucleated RBCs
- (D) Ureotelic mode of excretion

AIPMT 2012 Prelims

17. The maximum amount of electrolytes and water (70 - 80 percent) from the glomerular filtrate is reabsorbed in which part of the nephron ?

- (A) Descending limb of loop of Henle
- (B) Ascending limb of loop of Henle
- (C) Distal convoluted tubule
- (D) Proximal convoluted tubule

AIPMT 2011 Mains

18. Ureters act as urinogenital ducts in

- (A) Frog's both males and females
- (B) Frog's males
- (C) Human males
- (D) Human females

AIPMT 2011 Prelims

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

- (A) Loops of Henle
- (B) Peritubular capillaries
- (C) Convoluted tubules
- (D) Collecting ducts

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

- (A) Afferent arteriole: Carries the blood away from the glomerulus towards renal vein
- (B) Podocytes: Create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule
- (C) Henle's loop: Most reabsorption of the major substances from the glomerular filtrate
- (D) Distal convoluted tubule: Reabsorption of K^+ ions into the surrounding blood capillaries

21. Uricotelic mode of passing out nitrogenous wastes is found in

- (A) Insects and Amphibians
- (B) Reptiles and Birds
- (C) Birds and Annelids
- (D) Amphibians and Reptiles

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

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

23. In which one of the following organisms its excretory organs are correctly stated?

- (A) Humans – Kidneys, sebaceous glands and tear glands
- (B) Earthworm – Pharyngeal, integumentary and septal nephridia
- (C) Cockroach – Malpighian tubules and enteric caeca
- (D) Frog – Kidneys, skin and buccal epithelium

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

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

25. The principal nitrogenous excretory compound in humans is synthesised

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

26. What will happen if the stretch receptors of the urinary bladder wall are totally removed?

- (A) Micturition will continue
- (B) Urine will continue to collect normally in the bladder
- (C) There will be no micturition
- (D) Urine will not collect in the bladder

AIPMT 2009 Prelims · Q118

27. Uric acid is the chief nitrogenous component of the excretory products of:

- (A) Earthworm
- (B) Cockroach
- (C) Frog
- (D) Man

AIPMT 2007 Prelims · Q116

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

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

AIPMT 2006 Prelims · Q180

29. Earthworms are :

- (A) ureotelic when plenty of water is available
- (B) uricotelic when plenty of water is available
- (C) uricotelic under conditions of water scarcity
- (D) ammonotelic when plenty of water is available

AIPMT 2006 Prelims · Q200

30. Angiotensinogen is a protein produced and secreted by :

- (A) macula densa cells
- (B) endothelial cells (cells lining the blood vessels)
- (C) liver cells
- (D) juxtaglomerular (JG) cells

AIPMT 2005 Prelims · Q113

31. In Ornithine cycle, which of the following wastes are removed from the blood ?

- (A) Urea and urine
- (B) Ammonia and urea
- (C) CO₂ and ammonia
- (D) CO₂ and urea

AIPMT 2005 Prelims · Q193

32. A person is undergoing prolonged fasting. His urine will be found to contain abnormal quantities of :

- (A) fats
- (B) ketones
- (C) amino acids
- (D) glucose

Answer key and explanations

1. Answer: (C) Ketonuria and Glycosuria

In diabetes mellitus excess glucose (glycosuria) and ketone bodies (ketonuria) appear in the urine. Uremia is accumulation of urea in blood seen in kidney failure, and renal calculi are kidney stones, so neither indicates diabetes.

2. Answer: (B) Reabsorption of Na⁺ and water from renal tubules due to aldosterone

Aldosterone causes reabsorption of Na⁺ and water from the distal parts of the tubule, which reduces urine output and prevents diuresis. Under-secretion of ADH reduces water reabsorption and causes diuresis, ANF causes vasodilation and opposes the renin-angiotensin system, and less renin means less aldosterone.

3. Answer: (B) Maintaining hyperosmolarity towards inner medullary interstitium in the kidneys.

The counter-current mechanism keeps the medullary interstitium increasingly hyperosmotic towards the inner medulla, which draws water out of the collecting duct and concentrates urine. Low ADH levels do the opposite and produce dilute urine.

4. Answer: (C) (c) and (d) are correct

A dialyser removes urea and excess K^+ from blood, so nitrogenous waste and potassium do not build up. It cannot do the endocrine work of the kidney: no erythropoietin, so RBC production falls, and no activation of vitamin D (calcitriol), so calcium absorption from the gut falls.

5. Answer: (D) a-iv, b-i, c-ii, d-iii

Glycosuria is glucose in the urine, gout is accumulation of uric acid crystals in joints, renal calculi are masses of crystallised salts in the kidney, and glomerulonephritis is inflammation of the glomeruli.

6. Answer: (B) a-iv, b-i, c-ii, d-iii

Ultrafiltration happens in the Malpighian corpuscle (glomerulus with Bowman's capsule); the loop of Henle sets up the counter-current gradient that concentrates urine; the ureter carries urine; and the urinary bladder stores it. The proximal convoluted tubule mainly reabsorbs and is the distractor.

7. Answer: (B) Atrial Natriuretic Factor

Atrial natriuretic factor is released by the atrial walls when blood pressure or volume rises, and it causes vasodilation to lower pressure. A fall in pressure or volume instead triggers renin (and through it aldosterone) and ADH, which raise it.

8. Answer: (A) The ascending limb of loop of Henle is impermeable to water.

The ascending limb of Henle's loop is impermeable to water but transports electrolytes, which helps build the medullary concentration gradient. The descending limb is the opposite: permeable to water and almost impermeable to electrolytes.

9. Answer: (D) The efferent arteriole is wider than the afferent arteriole causing easier outflow of blood from the glomerulus.

High filtration needs high glomerular pressure, which comes from the efferent arteriole being narrower than the afferent arteriole; the statement that it is wider is false and would lower pressure. Large surface area, fenestrations and high capillary pressure all genuinely favour the large filtration volume.

10. Answer: (C) Descending limb of loop of Henle is impermeable to water.

The descending limb of Henle's loop is permeable to water but almost impermeable to electrolytes, so water leaves it and the filtrate becomes concentrated. It is the ascending limb that is impermeable to water.

11. Answer: (C) Hepatic Vein

Urea is made in the liver by the ornithine cycle, so blood leaving the liver in the hepatic vein carries the highest urea load. The renal vein carries the least, because urea has been removed by the kidneys.

12. Answer: (D) Renin

Renin starts the renin-angiotensin-aldosterone pathway, which increases Na^+ and water reabsorption and so reduces urine volume. Atrial natriuretic factor, alcohol (which inhibits ADH) and caffeine all increase output of dilute urine.

13. Answer: (D) Increase in aldosterone levels

Aldosterone from the adrenal cortex (released through the renin-angiotensin pathway) increases Na^+ reabsorption in the distal convoluted tubule. ADH acts mainly on water permeability of the distal tubule and collecting duct, and a fall in aldosterone would reduce, not increase, Na^+ reabsorption.

14. Answer: (C) A: Aquatic Amphibia; B: Frog, Humans; C: Pigeon, Lizards, Cockroach

Aquatic amphibians excrete ammonia; frogs and humans are ureotelic; and pigeons, lizards and cockroaches conserve water by excreting uric acid. The adult frog is ureotelic, which rules out the options that call it ammonotelic or uricotelic.

15. Answer: (A) juxta glomerular cells to release renin

A fall in GFR is sensed by the juxtaglomerular apparatus, whose JG cells release renin. Renin begins the renin-angiotensin pathway, which only later causes aldosterone release from the adrenal cortex.

16. Answer: (D) Ureotelic mode of excretion

Both humans and adult frogs excrete urea (ureotelic). Frogs have a three-chambered heart, nucleated RBCs and external fertilisation, whereas humans have a four-chambered heart and enucleate RBCs.

17. Answer: (D) Proximal convoluted tubule

The proximal convoluted tubule reabsorbs nearly 70–80 percent of the electrolytes and water from the glomerular filtrate. The loop of Henle and the distal tubule handle much smaller amounts.

18. Answer: (B) Frog's males

In male frogs the testes connect to the kidneys through vasa efferentia, so the ureter carries both sperms and urine and works as a urinogenital duct. In female frogs the ureter carries only urine, and in humans the ureter never carries gametes.

19. Answer: (C) Convoluted tubules

The convoluted tubules (PCT and DCT), along with Malpighian corpuscles, lie in the cortex of the kidney. Loops of Henle, collecting ducts and their capillary network dip into the medullary pyramids.

20. Answer: (B) Podocytes: Create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule

Podocytes of Bowman's capsule are arranged so that minute filtration slits (slit pores) are left between them, through which blood is filtered into the capsule. The afferent arteriole brings blood to the glomerulus, most reabsorption happens in the PCT, and the DCT secretes K^+ rather than reabsorbing it.

21. Answer: (B) Reptiles and Birds

Reptiles, birds, land snails and insects excrete nitrogen mainly as uric acid, which conserves water. Amphibians are ureotelic as adults, and annelids are mostly ammonotelic.

22. Answer: (B) When someone drinks lot of water, ADH release is suppressed

Drinking a lot of water dilutes the body fluids, so the hypothalamic osmoreceptors suppress ADH release and dilute urine is passed. Water loss in summer would stimulate ADH, and it is a fall in glomerular blood flow that triggers renin and angiotensin II formation.

23. Answer: (B) Earthworm - Pharyngeal, integumentary and septal nephridia

Earthworm excretes through three types of nephridia: septal, integumentary and pharyngeal. Tear glands are not excretory in humans, enteric caeca in cockroach are digestive (its excretory organs are Malpighian tubules plus fat body and uricose glands), and buccal epithelium is not an excretory organ in frog.

24. Answer: (D) Nearly 99 percent of the glomerular filtrate is reabsorbed by the renal tubules

About 180 L of filtrate is formed each day but only about 1.5 L of urine is passed, so nearly 99% is reabsorbed. The ascending limb is impermeable to water (not electrolytes), the descending limb is permeable to water, and the DCT does reabsorb HCO_3^- .

25. Answer: (A) In the liver but eliminated mostly through kidneys

Humans are ureotelic: the liver turns ammonia into urea through the ornithine cycle, and the urea travels in blood to the kidneys to be excreted in urine. The kidneys filter urea but do not make it.

26. Answer: (C) There will be no micturition

Micturition is a reflex: stretch receptors in the filling bladder send signals to the CNS, which then sends motor messages to contract the bladder muscle and relax the sphincter. Without stretch receptors, the reflex cannot start, so there will be no micturition. Urine would still reach the bladder from the ureters, but voluntary/reflex emptying would fail.

27. Answer: (B) Cockroach

Insects such as the cockroach are uricotelic: they excrete nitrogen mainly as uric acid to save water. Frog and man are ureotelic, and earthworm excretes mostly urea and ammonia.

28. Answer: (C) less urea in his urine

Urea is made in the liver from the amino groups of dietary and body proteins. With no protein intake, far less nitrogen enters the urea cycle, so urea in urine falls. Blood glucose drops during starvation rather than rising, and normal urine has almost no amino acids anyway.

29. Answer: (D) ammonotelic when plenty of water is available

Earthworms excrete mainly ammonia when plenty of water is available and switch to urea when water is scarce. They are not uricotelic.

30. Answer: (C) liver cells

Angiotensinogen is a plasma protein made by liver cells; renin from JG cells converts it to angiotensin I. JG cells secrete renin, not angiotensinogen.

31. Answer: (C) CO_2 and ammonia

In the liver's ornithine (urea) cycle, toxic ammonia and carbon dioxide taken from the blood are combined into urea. So the wastes removed from the blood are CO_2 and ammonia, and urea is the product that is formed, not removed.

32. Answer: (B) ketones

During prolonged fasting, the body burns stored fat. Incomplete oxidation of fatty acids produces ketone bodies, which spill into the urine (ketonuria). Glucose in the urine indicates diabetes, not starvation.

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