

Excretory Products and Their Elimination Important Questions With Answers

NEET Biology 2023

1. Some animals convert highly toxic NH_3 into toxic trimethylamine oxide (TMAO) and retain high concentration of TMAO and urea to minimise H_2O loss from body are:

- a) **Sharks and rays** b) Fresh water bony fishes c) Myxine d) Marine bony fishes

2. In Hydra waste material of food digestion and nitrogenous waste material removed from _____

- a) **mouth and body wall** b) mouth and tentacles c) mouth and nematocyst d) body wall and tentacles

Solution : -

Hydra being a coelenterate, has blind sac body plan. It has only one mouth which serves as the opening for ingestion and waste elimination besides diffusion across body wall

3. Uricotelism is found in _____

- a) Mammals and birds b) Fishes and fresh water protozoans c) **Birds, reptiles and insects**
d) Frogs and toads

Solution : -

Nitrogenous waste in uricotelic animals is eliminated in the form of uric acid. Ammonotelism is seen in aquatic animals wherein nitrogenous wastes is eliminated in the form of ammonia e.g. Fishes, tadpole. Ureotelism is observed in human beings in which nitrogenous waste is eliminated as urea

4. **Assertion:** Vasa recta is absent or highly reduced in cortical nephrons.

Reason: Cortical nephrons are mainly concerned with concentration of urine.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) **If assertion is true but reason is false.** d) If both assertion and reason are false.

Solution : -

Cortical nephrons lie in the renal cortex. They have short loop of Henle and no vasa recta. Hence, they are not involved in concentration of urine. They control plasma volume when water supply is normal.

5. Which of the following immune responses is responsible for rejection of kidney graft?

- a) Humoral immune response b) Inflammatory immune response c) **Cell-mediated immune response**
d) Auto-immune response

Solution : -

The body is able to differentiate self and nonself and the cell-mediated response is responsible for graft rejection.

6. Liquid which collects in the cavity of Bowman's capsule is

- a) concentrated urine b) **plasma minus blood proteins and blood cells** c) glycogen and water
d) sulphates and water

7. The kidney of an adult frog is _____

- a) pronephros b) **mesonephros** c) metanephros d) opisthonephros

Solution : -

Mesonephric kidney consists of a large number of cubules which develop internal glomeruli enclosed in capsules forming Malpighian bodies. In amphibians, (e.g. frog) it is functional both in embryo as well as adults

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

Column I	Column II
A. Glycosuria	(i) Accumulation of uric acid in joints
B. Gout	(ii) Mass of crystallised salts within the kidney
C. Renal calculi	(iii) Inflammation in glomeruli
D. Glomerular nephritis	(iv) Presence of glucose in urine

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

Solution : -

Glycosuria is condition in which there is presence of glucose in the urine. This is observed when the blood glucose level rises above 180mg / 100mL of blood. Gout is due to deposition of uric acid crystals in the joint. Renal calculi are precipitates of calcium phosphate produced in the pelvis of the kidney.

9. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Lungs	(i) Lactic acid
B. Liver	(ii) Hypertonic urine
C. Micturition	(iii) Counter-current system
D. Sweat	(iv) CO ₂
E. Vasa recta	(v) Urinary bladder
F. Sebum	(vi) Glucose
G. ADH	(vii) Bilirubin
H. Tubular reabsorption	(viii) Sterols

a) A-(iv), B-(vii), C-(v), D-(i), E-(iii), F-(viii), G-(ii), H-(vi)

b) A-(iii), B-(i), C-(iv), D-(viii), E-(ii), F-(v), G-(vii), H-(vi)

c) A-(iv), B-(viii), C-(i), D-(vi), E-(v), F-(iii), G-(ii), H-(vii) d) A-(vii), B-(i), C-(iv), D-(iii), E-(viii), F-(vi), G-(v), H-(ii)

10. Which one of the following correctly explains the function of a specific Part of a human nephron?

a) **Podocytes: create minute spaces (slit pores) for the filtration of blood into the Bowman's capsule**

b) Henle's loop: most reabsorption of the major substances from the glomerular filtrate

c) Distal convoluted tubule: reabsorption of K⁺ ions into the surrounding blood capillaries

d) Afferent arteriole: carries the blood away from the glomerular towards renal vein.

Solution : -

Podocytes create minutes spaces (slit pores) for the filtration of blood into bowman's capsule. Podocytes are cells in the bowman's capsule in the kidney that wrap around the capillaries of glomerulus. Podocytes bears projects, process or foot process. These processes wrap around the capillaries and leave slits between them through which filtration occurs.

11. Proximal and distal convoluted tubules are parts of _____

a) seminiferous tubules b) **nephron** c) oviduct d) vas deferens

Solution : -

Nephron is the structural and functional unit of kidney. Nephrons are also called renal tubules or uriniferous tubules. Each nephron is formed of two parts. (i) Bowman's capsule and (ii) Nephric tubule which is a long and coiled and is formed of proximal convoluted tubule, loop of Henle and distal convoluted tubule.

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

a) When someone drinks lot of water ADH release is suppressed

- b) Exposure to cold temperature blood flow stimulates formation of Angiotensin II
- c) An increase in glomerular blood flow stimulates formation of Angiotensin II
- d) During summer when body loses lot of water by evaporation, the release of ADH is suppressed

Solution : -

When someone drinks lot of water ADH release is suppressed. Because when water enters into the blood, it becomes more diluted. Osmolarity of blood decreases and in this condition no need of ADH and thus excess of water is excreted out from body.

13. Mark the incorrect statement :

- a) Micturition is carried out by a reflex
- b) ADH helps in H₂O elimination, making the urine hypotonic**
- c) Protein-free fluid is filtered from blood plasma into the Bowman's capsule
- d) Glucose is actively reabsorbed in the PCT

14. Glycosuria is the condition, where a man

- a) eats more sugar
- b) excretes sugar in urine**
- c) sugar is excreted in faeces
- d) has low sugar level in blood.

15. Which part of brain sends voluntary motor signals to smooth muscles of urinary bladder when the bladder get filled with urine?

- a) Medulla
- b) Cerebral cortex**
- c) Hypothalamus
- d) Brain stem

16. Uric acid is an excretory product of

- (a) Cockroach
 - (b) Sparrow
 - (c) Terrestrial reptiles
 - (d) Man
- a) (a) & (d) b) (b) & (d) c) (a), (b), & (c) **d) (a), (c) & (d)**

17. **Assertion:** DCT and collecting duct maintain the pH and ionic balance of blood.

Reason: DCTs of many nephrons open into a collecting duct.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
- b) If both assertion and reason are true but reason is not the correct explanation of assertion**
- c) If assertion is true but reason is false.
- d) If both assertion and reason are false.

18. Nitrogenous metabolic wastes in our body are the products of

- a) Carbohydrates
- b) Proteins
- c) Lipids
- d) Vitamins**

19. The dotted appearance of cortex of kidney is due to

- a) ducts of Bellini
- b) convoluted parts**
- c) loop of Henle
- d) collecting tubes.

Solution : -

The dotted appearance of cortex of kidney is due to the presence of convoluted parts of the tubule (proximal and distal convoluted tubules).

20. Which of the following pairs of organisms are uricotelic?

- a) Cartilaginous fish and mammals
- b) Reptiles and mammals
- c) Birds and insects**
- d) Bony fish and lizards

Solution : -

Birds and insects excrete nitrogenous wastes as uric acid in the form of pellet or paste with a minimum loss of water and are thus called uricotelic animals.

21. A condition of failure of kidney to form urine is called _____

- a) deamination b) entropy **c) anuria** d) None of these

Solution : -

The terms anuria, oligonuria, polyuria and dysuria are used for absence of urine, scanty urine, large amounts of urine and painful urination respectively. Deamination is the removal of an amino (-NH₂) group frequently from an amino acid by transaminase enzyme.

22. Where do you find podocyte cells in human body?

- a) Brain b) Liver **c) Kidney** d) Pancreas

23. Consider the following four statements (i) - (iv) and select the option that correctly identifies the true (T) and false (F) ones.

(i) Micturition is carried out by a reflex.

(ii) ADH helps in water elimination making the urine hypotonic.

(iii) Protein-free fluid is filtered from blood plasma into the Bowman's capsule.

(iv) Glucose is actively reabsorbed in the proximal convoluted tubule

a)

(i)	(ii)	(iii)	(iv)
T	F	T	T

b)

(i)	(ii)	(iii)	(iv)
T	T	F	F

c)

(i)	(ii)	(iii)	(iv)
F	F	F	T

d)

(i)	(ii)	(iii)	(iv)
F	T	F	T

Solution : -

ADH helps in water reabsorption, making the urine hypertonic.

24. Long ducts of collecting tubules extend from

- a) cortex to inner part of medulla** b) medulla to outer cortex c) medulla to inner cortex

d) cortex to outer part of medulla.

Solution : -

Long ducts of collecting tubules extends from cortex to inner part of medulla.

25. Under normal conditions which one is completely reabsorbed in the renal tubule?

- a) Urea b) Uric acid c) Salts **d) Glucose**

Solution : -

Glucose is high threshold substance, i.e., it is totally or mostly reabsorbed from the nephric filtrate in the blood capillaries. Renal threshold, i.e., upper limit of kidney to reabsorb such high threshold substances of kidney for reabsorption of glucose is about 180 mg / 100 mL of nephric filtrate. When blood sugar level reaches beyond this, sugar also appears in urine.

26. Consider the following statements each with one or two blanks.

(i) Towards the centre of the inner concave surface of the kidney is a notch called (1) through which ureters, blood vessels and nerves enter.

(ii) The medulla of kidney is divided into a few conical masses called (2) projecting into the (3).

(iii) Glomerulus is a tuft of capillaries formed by the (4) artery. Blood from the glomerulus is carried away by (5) artery.

Which one of the following options correctly fills the blanks in any two of the statements?

- a) (1) -renal pelvis, (2)-calyces, (3)-medullary pyramids

- b) (2)-medullary pyramids, (3)-calyces, (4)-afferent, (5)-efferent**

- c) (2)-columns of Bertin, (3)-chordae tendinae, (4)-efferent, (5)-afferent d) (1)-hilum, (4)-efferent, (5)-afferent

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

a) Descending limb of Loop of Henle is impermeable to water

b) Distal convoluted tubule is incapable of reabsorbing HCO₃

- 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

Solution : -

Nearly 99 percent of the glomerular filtrate is reabsorbed by the renal tubules. About 180 litre of filtrate is produced each day but only 1.5 litre of urine is excreted out per day. It indicates that 99 per cent of the filtrate has to be reabsorbed by the renal tubules

28. **Assertion:** Nephrons are of two types: cortical and juxtamedullary according to their relative position in the cortex.

Reason: Juxtamedullary nephrons have short loop of Henle while cortical nephrons have long loop of Henle.

- a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false. d) If both assertion and reason are false.

Solution : -

On the basis of location, the nephrons are of two types. In majority of nephrons, the loop of Henle is too short and extends only little into the medulla. These nephrons are called cortical nephrons and form 85% of the total nephrons. In some of the nephrons, the loop of Henle is very long and runs deep into the medulla. These nephrons are called juxta medullary nephrons and form 15% of the total nephrons.

29. Least toxic nitrogenous waste among the following is

a) Urea **b) Uric acid** c) Ammonia d) More than one option is correct

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

a) Increase in aldosterone levels b) Increase in antidiuretic hormone levels
c) Decrease in aldosterone levels **d) Decrease in antidiuretic hormone levels**

Solution : -

Increase in aldosterone level causes an increase in sodium reabsorption in the distal convoluted tubule (DCT). Aldosterone is secreted by zona glomerulosa of adrenal cortex. It helps in reabsorption of Na^+ from DCT, Na^+ raises osmotic pressure of the blood and causes water reabsorption and thus prevents water loss from the body.

31. Presence of glucose (glycosuria) and ketone bodies (ketonuria) in urine are indicative of _____.

a) Renal failure **b) Diabetes mellitus** c) Bright's disease d) Renal stone

32. Which of the following is an incorrect match?

a) Bowman's capsule - Glomerular filtration **b) DCT - Absorption of glucose**
c) Henle's loop - Concentration of urine d) PCT - Absorption of Na^+ and K^+ ions

Solution : -

In OCT (distal convoluted tubule) reabsorption of sodium ions, chloride ions and water occurs.

33. Read the given statements and select the correct option.

Statement 1: The final reabsorption of water from the urine into the blood occurs through the collecting duct of a mammalian nephron resulting in the production of hyperosmotic urine.

Statement 2: The loop of Henle creates a sodium gradient in the interstitial fluid.

- a) Both statements 1 and 2 are correct. b) Statement 1 is correct but statement 2 is incorrect.
c) Statement 1 is incorrect but statement 2 is correct d) Both statements 1 and 2 are incorrect.

Solution : -

The counter current mechanism in loop of Henle and vasa recta, helps in maintaining an increasing osmolarity of the interstitial fluid i.e., from 300 mos mol L^{-1} in the cortex to about 1200 mos mol L^{-1} in the inner medulla. This gradient is mainly caused by NaCl and urea. This gradient thus helps in easy reabsorption of water from the filtrate in the collecting duct so as to produce hyperosmotic urine.

34. The condition of accumulation of urea in the blood is termed as

a) renal calculi b) glomerulonephritis **c) uremia** d) ketonuria

Solution : -

In uremia, concentration of urea goes high in blood because the tubules are not able to remove it from blood.

35. Which one of the following statements is incorrect?

a)

The medullary zone of kidney is divided into a few conical masses called medullary pyramids projecting into the calyces

b) Inside the kidney the cortical region extends in between the medullary pyramids as renal pelvis.

c) Glomerulus along with Bowman's capsule is called the renal corpuscle

d)

Renal corpuscle, proximal convoluted tubule (PCT) and distal convoluted tubule (DCT) of the nephron are situated in the cortical region of kidney.

Solution : -

Inside the kidney, the cortical region extends in between the medullary pyramids as renal columns called columns of Bertin.

36. Match the abnormal conditions given in Column A with their explanations given in Column B and choose the correct option.

Column A	Column B
A. Glycosuria	(i) Accumulation of uric acid in joints
B. Renal calculi	(ii) Inflammation in glomeruli
C. Glomerular nephritis	(iii) Masses of crystallised salts within the kidney
D. Gout	(iv) Presence of glucose in urine

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

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

37. On an average, how much urea is excreted out per day by an adult human?

a) 25-20 g b) 15-20 g **c) 35-40 g** d) 40-45 g

38. Which one of the following is not normally excreted in urine?

a) Uric acid **b) Haemoglobin** c) Ketone bodies d) Hippuric acid

Solution : -

Haemoglobin is not normally excreted in urine. If haemoglobin gets excreted in urine, the condition is known as haemoglobinuria.

39. Diuretic substances like tea, coffee, alcohol etc. increases urine output by inhibiting release of hormone

a) Renin b) Aldosterone **c) ADH** d) Erythropoietin

40. Read the given statements regarding human excretory system and select the correct ones.

(i) Presence of glucose in urine is known as uremia.

(ii) Distal convoluted tubule (DCT) selectively secretes hydrogen ions, ammonia and potassium ions into the filtrate.

(iii) Macula densa is formed by cellular modifications in the distal convoluted tubule and the afferent arteriole at their contact location.

(iv) Atrial natriuretic factor (ANF) can cause vasoconstriction when blood flow is low to the atria of the heart.

a) (i) and (ii) b) (i) and (iii) **c) (ii) and (iii)** d) (iii) and (iv)

Solution : -

Presence of glucose in the urine is called glycosuria. ANF can cause vasodilation when blood flow is high to the atria of the heart.

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

- a) **juxtaglomerular cells to release renin** b) adrenal cortex to release aldosterone
c) adrenal medulla to release adrenaline d) posterior pituitary to release vasopressin.

Solution : -

A fall in GFR can stimulate the JG cells to release renin which can stimulate the glomerular blood flow and thereby the GFR comes back to normal.

42. We can produce concentrated/dilute urine. This is facilitated by a special mechanism. Identify the mechanism.

- a) Reabsorption from PCT b) Reabsorption from Collecting duct c) Reabsorption/Secretion in DCT

d) Counter current mechanism in Henle's loop/Vasarecta

Solution : -

The counter current mechanism helps to concentrate the filtrate which occurs in loop of Henle and vasa recta in the medulla region of the kidney. This gradient is mainly caused by NaCl and urea. It helps in easy absorption of water from the filtrate present in the collecting duct so that the concentration of the filtrate (urine) is increased. Therefore, hypertonic urine is produced in human beings.

43. The characteristic(s) common to urea, uric acid and ammonia is/are

- (i) They are nitrogenous wastes.
(ii) They all need very large amount of water for excretion.
(iii) They are all equally toxic.
(iv) They are produced in the kidneys.
a) (i), (iii) and (iv) **b) (i) only** c) (i) and (iii) d) (i) and (iv)

Solution : -

Urea, uric acid and ammonia are known as nitrogenous wastes as they are produced during protein metabolism. Ammonia needs very large amount of water for excretion, second in order comes urea and then uric acid. Ammonia is highly toxic, then comes urea and then uric acid. Ammonia and urea are produced in the liver and uric acid is formed mostly in the liver and to some extent in kidneys.

44. Human urine is usually acidic because _____

- a) excreted plasma proteins are acidic b) potassium and sodium exchange generates acidity
c) hydrogen ions are actively secreted into the filtrate
d) the sodium transporter exchanges one hydrogen ion for each sodium ion in peritubular capillaries

Solution : -

Human urine is usually acidic because hydrogen ions (H^+) are actively secreted into the filtrate. The proximal tubule of nephron of the kidney which comes from Bowman's capsule and leads to the loop Henle' regulates the pH of the filtrate by exchanging H^+ ions in the filtrate

45. Which of the following is the correct pathway for passage of urine in humans?

- a) Collecting tubule → Ureter → Bladder → Urethra**
b) Renal vein → Renal ureter → Bladder → Urethra c) Pelvis → Medulla → Bladder → Urethra
d) Cortex → Medulla → Bladder → Ureter

46. Aquatic reptiles are _____

- a) ammonotelic **b) ureotelic** c) ureotelic in water d) ureotelic over land

Solution : -

Ureotelic animals include, Ascaris, earthworm, cartilaginous fishes, semiaquatic amphibians, aquatic or semiaquatic reptiles like turtles and alligators

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

- a) Ascending limb of loop of Henle b) Distal convoluted tubule **c) Proximal convoluted tubule**
d) Descending limb of loop of Henle

Solution : -

The maximum amount of electrolytes and water (70-80 %) from the glomerular filtrate is reabsorbed in Proximal convoluted tubule. PCT is made up of simple cuboidal brush bordered epithelium to increase surface area for reabsorbtion. In this region glucose, amino acids, vitamins, hormones, sodium, potassium, chlorides, phosphates, bicarbonates and most of the water are reabsobred.

48. Earthworms are_____

- a) uricotelic when plenty of water is available
- b) uricotelic under conditons of water scarcity
- c) ammonotelic when plenty of water is available**
- d) ureotelic when plenty of water is available.

Solution : -

We see, some animals of dual behavior of excretion e.g. earthworm. It excretes ammonia when enough water is available but excretes urea (ureotelic) in dry conditions.

49. Which of the following statements is incorrect?

- a) Mammals have the ability to produce concentrated urine.
- b) Counter current is due to the flow of filtrate in two limbs of Henle's Loop in opposite direction.
- c) Henle's loop and vasa recta play a significant role in concentrating the urine.
- d) Flow of filtrate through vasa recta also follow the counter current pattern.**

Solution : -

Flow of blood through vasa recta follows counter current pattern. Filtrate flows through loop of Henle.

50. Excretion of potassium is governed primarily by

- a) potassium reabsorption in proximal convoluted tubule
- b) potassium secretion in proximal convoluted tubule
- c) potassium secretion in distal convoluted tubule**
- d) potassium reabsorption in distal convoluted tubule.

Solution : -

Potassium is reabsorbed by active transport in PCT. However, selective secretion of hydrogen and potassium ions in OCT must influence the excretion of potassium.